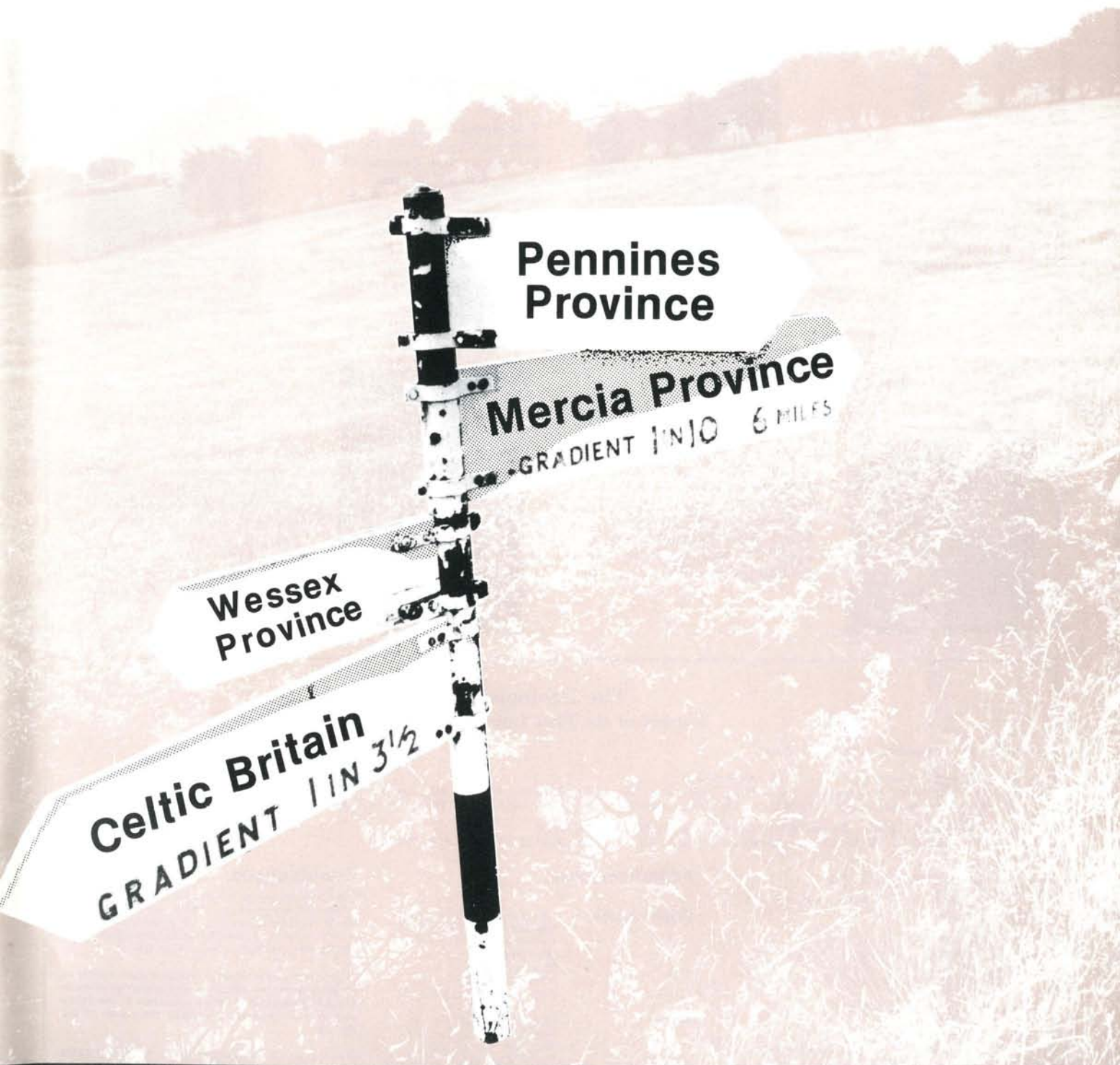


# The Ecologist

Journal of the Post Industrial Age Vol. 14 No. 4 1984 £2



**Bioregionalism —**  
**Where have Britain's regions gone?**



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## Editorial

Edward Goldsmith  
and Peter Bunyard

Industrial Pollution—Getting away with the Crime .....	138
--	-----

## Feature Articles

Amory B. Lovins  
and L. Hunter Lovins

Building a Secure Society .....	141
---------------------------------	-----

In this article the authors, winners of the 1983 Alternative Nobel Prize, state that big power politics is leading the world to destruction. For survival people must create a new decentralised society using local resources, including energy.

Joseph Weinstock

Getting the Right Feel for Soil .....	146
---------------------------------------	-----

Traditional farmer-gardeners in the Tropics could tell from a soil's taste, colour and feel what kind of crop it should support and when. Analytical chemistry has proved a deficient substitute for tradition and time-tested practice.

Peter Freeman  
and Tomas Fricke

The Success of Javanese Multi-storied Gardens .....	150
---	-----

Shifting cultivation and polyculture have proved a viable means of producing food in rain-swept upland regions where paddy culture is impractical.

Charles W. Heckman

Telling Them what They want to hear .....	153
---	-----

The author finds it virtually impossible to get support for science when the answers will not please the sponsors.

Alwyn Jones

Alternative Medicine—Alternative Society .....	156
--	-----

Interest in holistic medicine is another indicator of the growing dissatisfaction in society for the industrialised world's system of values. The author suggests an alternative society is in the making.

Bryan Waites

The Search for Britain's Regions .....	161
--	-----

The true geographically, culturally defined regions of Britain still exist despite centralised government and its authority. Rather than depress regionalism further regional consciousness should be awakened in the development of a healthier society.

Kirkpatrick Sale

Bioregionalism—A New Way to treat the Land .....	167
--	-----

Bioregions are naturally defined areas where human beings should live as part of the natural ecology. Awareness of a bioregion's attributes should enhance our ability to survive in a world where natural resources are being rapidly destroyed.

## Obituary

Peter Bunyard

Hilda Murrell—Rose Grower and Ecology Activist .....	173
--	-----

David Cusack—Researcher into Andean Food Crops .....	173
--	-----

## Reports

David Ross

Waves and other clean Energy .....	175
------------------------------------	-----

John Cohen and John Seed

In Defence of Daintree—Australia's Tropical Rainforest .....	176
--	-----

Appen Features

Eucalyptus—The Controversy continues .....	177
--	-----

Mahinda Fernando

Pinus and Eucalyptus no Answer .....	177
--------------------------------------	-----

Warwick Fox

The Liberation of Life .....	178
------------------------------	-----

A Book Review Article

## Books

.....	182
-------	-----

## Digest

Cover idea: Peter Bunyard and Maria Parsons

Cover artwork: Mark Finch

## Industrial Pollution: Getting away with the crime

In Britain the legal system came about to protect the rights of the individual against attacks on his person or on his property. Anyone shown up to be a criminal, even a common thief, would be likely to suffer a fate at least as bad as death, and if not actually hanged, sent off to the colonies where his chances of survival would be pretty low.

Today most crimes remain more or less the same, we even have our traitors, and all that has really changed are the sentences passed and conditions in the prisons. But in addition to the crimes of murder, treason, robbery and corruption, a relatively new category of misdemeanours has come into being which can be perpetuated with the full cognisance and even approbation of the state, even though such activities may be far more devastating in their impact and consequences compared with the most treasonable action.

Thus industrial man has at his disposal through the power of science and technology the means to destroy the immediate environment and beyond, while actually receiving awards from the state for his productivity and ingenuity. In Britain the manufacturers of the most potent poisons, agrochemicals for example, or the producers of radioactive waste, not only receive the Queen's Award for industry, but they have entire government departments in league with them, happy to oblige in proving the harmlessness of their activities.

The disgraceful level of pesticides and herbicides in our vegetables, discovered not by the watchdogs of the Ministry of Agriculture and Fisheries (MAFF), but by a reputable firm of analytical chemists, is a case in point; so too is the experiment carried out in the mid to late 1950s in which increased levels of radioactive waste were actually discharged from the Sellafield works in Cumbria (Windscale) to find out where it was going. According to Dr John Dunster, director of the National Radiological Protection Board (NRPB), the experiment 'had the support of the authorising government departments'. Meanwhile Dunster himself reported in the 1958 proceedings of the Geneva Conference on the Peaceful Uses of the Atom, 'discharges (from Sellafield) have been deliberately maintained . . . high enough to obtain detectable levels in samples of fish, seaweed and shore sand, and the experiment is still proceeding. In 1956 the rate of discharge of radioactivity was deliberately increased, partly to dispose of unwanted wastes, but principally to yield better experimental data.'

In a letter to the *Lancet*, Dr Robin Russell Jones, a dermatologist at St John's Hospital, London, is in

little doubt that the ever increasing discharges of radioactive waste during the 1960s and 1970s from Sellafield have been responsible for the toll of childhood cancers in that part of Cumbria. He castigates Sir Douglas Black and his investigators for 'their unprecedented betrayal of the public interest' in producing a report on the cancer cases which fails to pin responsibility where it is due.

Wastes of all kinds continue to cloud our skies, blacken our waters, impregnate our food and clothing, the results of such experiments becoming manifestly clear in an ever rising toll of cancers and other degenerative disease. Clearly too, our legal system has so far failed to deal properly with the perpetrators of such crimes against humanity.

But those who, over the ages, helped to draw up the law could not possibly have entertained the notion that one day it would be possible to contaminate the environment to the point when no-one in his right mind would want to live there. Indeed once lethal substances like plutonium and americium have been allowed to contaminate an area a certain number of deaths from cancers and genetic disorders are inevitable. A kind of murder has taken place, as brutal in its way as a psychopath's senseless killing of his victims. Meanwhile a major accident in a reprocessing plant, such as happened at Kyshtym in the Urals in Russia, and the area becomes uninhabitable for hundreds if not thousands of years. While our legal system provides that muggers and pickpockets can be properly punished it is woefully inadequate when dealing with the arch irresponsibility of those who are the captains of industry in our modern industrial society.

As William Greider notes "a street hoodlum who assaults someone with a gun or a knife will clearly get locked up for his crime but the swift sword of justice hesitates when a business executive assaults an entire community with poisonous chemicals."

Fortunately, this legal anomaly is, in the USA at least, beginning to be redressed. In a recent study by the Bureau of Justice Statistics, 60,000 people were asked to rank different crimes in what they regarded as their order of seriousness. The results were quite encouraging. Most people considered that the bombing of a public building leading to the death of 20 or more people was the worst of the crimes mentioned. Murder was also regarded as very serious, though it figured only seventh on the list. However, regarded as much more serious than hijacking an aeroplane or even heroin smuggling was



the corporate crime of disposing of industrial waste in such a way that it polluted a city's water supply and led, as in the crime put at the top of the list, to the death of 20 people or more.

Even more encouraging was that acts of pollution, even when they did not lead to any deaths, were regarded as very serious. Thus the directors of factories polluting the environment were seen as being greater criminals than muggers, corporate lobbyists who bribed a government official, or even teenage boys who beat up their mothers. As the authors point out, the survey showed just how much judges who are still lenient to polluters are "out of step on this issue."

Peter Beeson a former justice department lawyer who has done much work for the Environmental Protection Agency (EPA) notes some of the difficulties in convicting the corporate polluters. They are usually very high up in the social hierarchy and indeed are often seen as veritable pillars of society. To convict such people "is not something society is used to doing."

Judges, however, are now beginning to overcome their reticence in handling such problems, as illustrated by the following incident. It was discovered that the management of the Precision Speciality Metals Company was illegally disposing of 4,000 gallons a day of hexavalent chromium, a carcinogenic substance, into the Los Angeles city sewer. When the company learnt that the police was about to investigate, it reacted rapidly, installing 300 feet of piping to divert the chemical into the county sewers. But this expedient failed. The police found out about it and the management was taken to court. As Greider notes, "If Precision Speciality Metals, then a division of Plessey Incorporated, a \$300 million firm traded on the New York Stock Exchange, had been a whorehouse or a stolen car ring or an after-hours gambling joint, a police raid would have caught them in the act, and somebody would have gone to jail. Corporate crime is usually treated more gently. If plant managers get caught, they have to sign a legal agreement promising to correct the violations and to sin no more. At worst, the company might have to pay a modest fine; and a few thousand dollars in fines seems cheap compared to the cost of obeying the law. Besides, it's written off as a cost of doing business."

But the management was in for a shock. It was up against a responsible city attorney, Ira Reiner, who, instead of filing a civil law suit brought criminal charges against the company. As a result not only was the managing director jailed for 120 days but the company had to pay for a half page advertisement in which it fully described its criminal behaviour in the Wall Street Journal—a newspaper that was chosen because it "finds its way into every corporate boardroom in America". As Reiner puts it "We want to put a chill in the boardrooms. We want them, to understand that if they violate the law, they had best get away with it, because if they don't they are going to go to jail."

Reiner did not stop at that. Since then he has obtained criminal convictions for one vice president, two presidents and a board-chairman and, at the moment, (May 1984), is filing a 341-count criminal suit against 11 members of the management, including a corporate vice-president of Todd Shipyard,

one of America's largest ship-builders. All are accused of complicity in illegally disposing of six old transformers containing PCBs which they are accused of having carted off by a junk dealer and burnt without proper safeguards in the Mojave Desert (in order to save \$58,000, the cost of doing the job properly).

An increasing number of judges are now condemning polluters to jail sentences. Thus a few years ago in Kentucky a federal judge Charles M Allen sentenced a polluter to jail with these words. "If the reckless disposal of pollutants is allowed to continue unchecked, it is this court's fear that irreparable damage to our planet will result. Contamination will result in the eventual and predictable disappearance of viable land, water and other natural resources, causing an ecological imbalance which could result in the death of our world as we know it."

Such a judge is a long way ahead in his thinking of our politicians, bureaucrats and most of our scientists in this country who continue to play down the seriousness of pollution—and indeed who would probably lose their jobs if they pronounced themselves as openly as did Judge Allen in Kentucky.

At the Windscale Public Enquiry of 1977 witness after witness gave evidence that the radioactive pollution of the Cumbrian coastline and of the land beyond was bound to lead to disease, even though undetectable by the statistical surveys carried out by the government and its official watchdogs such as the NRPB. Yet all such warnings went unheeded. The recent coming to light of clusters of disease in various areas touched by radioactive pollution is at last waking a few politicians and lawmakers from their slumbers. Mr Charles Haughey, former Prime Minister of Ireland and the present leader of the Fianna Fail opposition did not mince his words when commenting on the Black Report. He regarded the report on the leukaemia in the Sellafield area as 'a scandalous cover-up', and 'all those responsible for that particular plant and for the denials should be put in jail.'

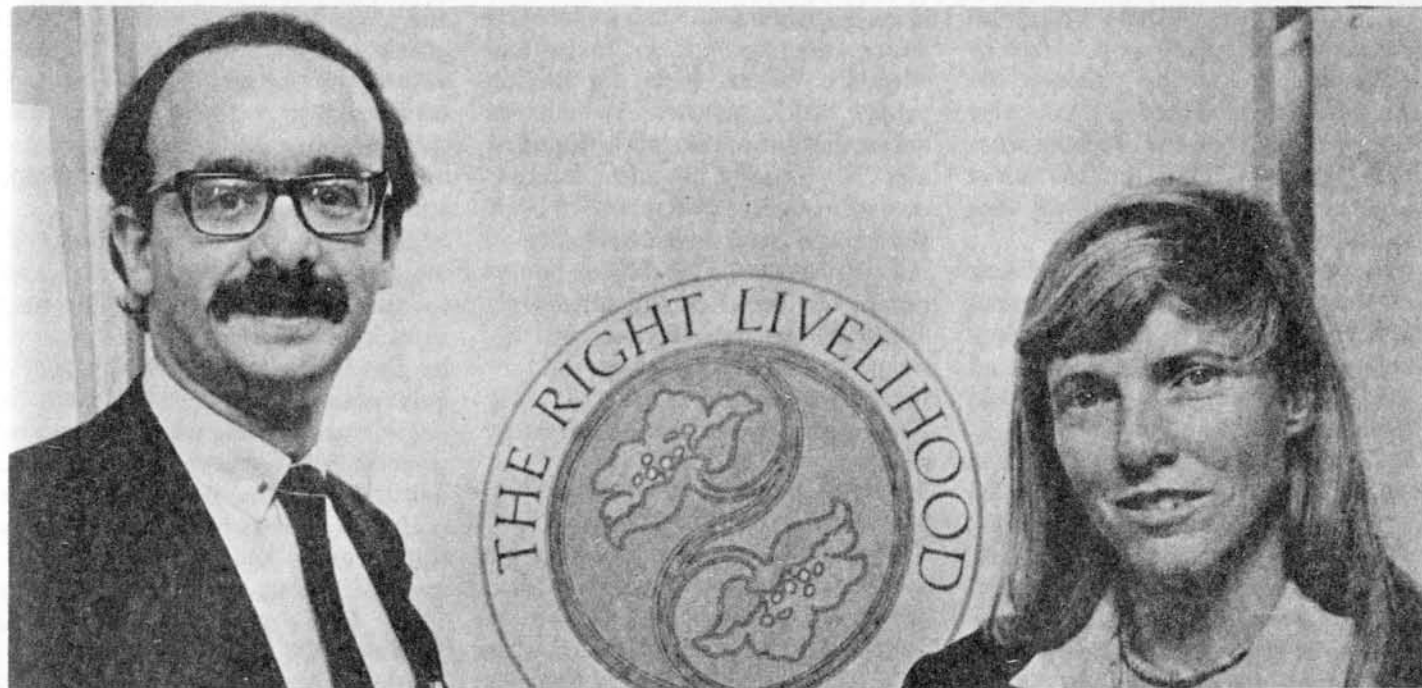
Since Haughey pronounced those words, the Director of Public Prosecutions has decided to bring a case against BNFL for failing to keep proper records of radioactive emissions to the sea, for failing to keep radioactive discharges "as low as reasonably achievable" and for failing to keep radioactive materials under control. This will be the first prosecution to be conducted under the Radioactive Substances Act of 1960 and the Nuclear Installations Act of 1965.

If the company be found guilty its representatives could be sentenced to prison terms of up to five years. Such will be unlikely to happen: it will set too dangerous a precedent, and seriously incriminate all the government bodies which have been systematically helping Mr Con Allday, the managing director of BNFL, to cover up the true extent of the contamination caused by his enterprise, now generally regarded as the most highly polluting nuclear installation in the world.

It is indeed much more likely that Mr Con Allday will be honoured for the jobs his enterprise has generated rather than imprisoned for the pollution with all its attendant miseries that it has caused.

*Edward Goldsmith and Peter Bunyard*

*The Ecologist, Vol. 14, No. 4, 1984*



## BUILDING A SECURE SOCIETY

by Amory B. Lovins and L. Hunter Lovins

This article is based on the Lovins' speech in Stockholm last December on receiving the *Right Livelihood Foundation Award*. In it the Lovins expose the utter madness and illusion of the pursuit of security through the nuclear arms race. Similarly the growth and development of the high centralised energy society leads to another kind of insecurity. They propose a decentralised soft-energy based society, that can develop in a benign fashion, free from the hegemony of big power politics.

What is it that we care about? The great challenge facing the world is to enable people to feel more safe, valued, empowered, and responsible: in short, to begin building real security through individual and community action. This motive underlay our work on least-costly, nonviolent energy strategies, and on how an economically rational energy policy can help to solve problems as diverse as CO<sub>2</sub>-related climatic change, the lack of affordable energy for economic and cultural development, and the spread of nuclear bombs.

Today, the nuclear bombs in the world are equivalent to more than one and a half million Hiroshimas, increasing by dozens per day. A single Poseidon submarine can carry about enough warheads to land the equivalent of three Hiroshimas on each of the 200-odd Soviet cities of over 100,000 people. The United States has thirty-one such submarines. Yet apparently thinking these too few,

the US is also building bigger submarines with Trident missiles accurate enough to attack Soviet missile silos—and why attack silos whose missiles have already been launched? Having decided that its thousand-odd land-based missiles are becoming more vulnerable to attack, the US is building more of them: MX missiles, which have been trying for some fifteen years to find a hole to crawl into. The MX, with ten highly accurate warheads, is also a first-strike weapon, offering a bonus to the side that launches first. Soviet missile designs and policies appear to be moving in the same ominous direction, playing catch-up as they have done ever since 1945.

While American officials complain that arms-control treaties are hard to verify, US actions seek to make them impossible to verify—by arming planes, ships, and perhaps pickup trucks with miniature, easily concealed cruise missiles. Similar missiles will doubtless soon appear on

Soviet submarines. And while US commentators shudder at the trigger-happiness of the Soviet command that decided, after more than two hours' deliberation, to shoot down a Korean airliner, President Reagan presses ahead with European siting of Pershing II missiles which will give that same Soviet command about six minutes to decide whether to blow up the world.

The Soviet government has offered to reduce its SS-20 missiles targeted on Western Europe to a level (some 120-140 missiles) amounting to about half the warheads, with less than a tenth of the explosive power, already targeted on Western Europe for the past two decades. By rejecting this offer, the United States has achieved no such reductions; on the contrary, there will now be hundreds of additional missiles on both sides—all probably on a hairtrigger 'launch-on-warning' alert in which a malfunctioning 10-kronor computer chip

could undo the evolutionary progress of the past few milliard years. And as a bonus added to this insanity, the Reagan Administration has also achieved in Western Europe what the Soviet Union could never accomplish: the popular delegitimation of NATO.

Since all these things are being done in the name of US national security, it is worth recalling a key insight which Philip Morrison and the Boston Study Group provided in their remarkable book *The Price of Defense*\*. They showed that there is no significant military threat to the United States that can be defended against. By this they meant that, owing to geography, Americans need not be worried about armadas of Soviets or Chinese in rowboats. Both are simply too far away to pose a conventional military threat to the North American landmass. Such threats could exist, and are of three kinds:

- terrorism—which a free society cannot defend against, though it could make itself less vulnerable and less tense;
- minor border incursions of the sort that the Coast Guard is designed to cope with; and
- strategic nuclear attack—against which there is no defense, although if one believes in deterrence one might be able to deter it. (Deterrence requires, among other paradoxical things, that each side be rational enough to be in fact deterred by the threat of mutual annihilation, yet also appear to the other side to be irrational enough to carry out that threat.)

The military threats of terrorism, border incursions, and nuclear attack, insofar as they can be handled at all, can be handled (as the Boston Study Group's analysis showed) with military forces less than three per cent the size and cost of present US forces: in essence, by a Coast Guard plus a handful of Poseidon submarines. The other ninety-seven per cent of US military budgets goes for general-purpose forces to project American power into other people's disputes in other countries where the President of the United States perceives the US has an interest (to put it as neutrally as we can).

For both the announced purpose of defense and the unannounced purpose of bullying, the United States

alone is spending about ten thousand dollars per second on more and allegedly better tools for killing people. World military expenditures are several times this level. But what sort of security is such military investment actually buying? In 1945, the United States was militarily all but vulnerable. Today, 30,000 bombs richer, the same nation is entirely exposed to devastation at any moment. Whatever that military budget is buying, it's not making Americans, or anyone else, really secure.

Indeed, security is being eroded, not only by the multiplication and refinement of weapons, but also by their spread. Nowadays the firepower of a World War II can be packaged to fit neatly beneath your bed. Nuclear delivery vehicles can thus include not just missiles, whose radar tracks mark their origin for retaliation, but also tramp freighters, fishing boats, ox-carts, rental vans, and parcel services. If the middle of New York disappeared in a bright flash at 8:00 tomorrow morning, but nobody said "We did it," against whom would those 'deterrent' missiles be launched? Nuclear attacks can be anonymous and thus undeterrable. As the seeds of nuclear bombs, sown for decades around the world, begin to germinate—so far in India, Israel, South Africa, Pakistan,

and Argentina, and soon in such places as Iraq, Iran, Libya, Taiwan, South Korea, and Brazil—anonymous nuclear attacks become not only possible but likely. Military might cannot prevent such attacks and may even invite them.

The spread of nuclear bombs is motivated by the prestige attached to them and by the domineering capacity derived from them—notably by the United States, which is the only nation to have used them in anger, the only one which refuses to promise not to use them first again, and the main one basing its foreign policy on threats of nuclear violence (such threats having been made, on average, about once a year since 1945). These political ends are so inviting that only one country, Sweden, is known to have abandoned a bomb programme already in progress (though she has apparently retained the means to make bombs quickly if she so chose).

Of course, making bombs requires not only motives but also means; and nuclear power programmes have exported those means around the world. The materials, knowledge, skills, equipment, and organisations used for nuclear power are so unavoidably usable for bombs that it is impossible to have one without the other—notwithstanding efforts (notably by some distinguished

### The Right Livelihood Foundation Awards 1983

The Alternative Nobel Prize was introduced four years ago by a Swedish-German, Jakob von Uexkull, who sold his valuable postage stamps to fund it. It is presented in Stockholm on December 9th, the day before the Nobel Prize ceremony to "honour and support those working on practical solutions to the real problems facing us today."

In addition to Amory and Hunter Lovins, the winners of the 1983 award were:

- High Chief Ibedul of Palau, a small Pacific nation under US Trusteeship, struggling to uphold its constitution in declaring Palau nuclear-free, despite massive US opposition.
- Manfred Max-Neef, a "barefoot economist" (see book review p. 182) working in Latin America, who set out to show that positive changes can be brought about at the local level with meagre resources and very little outside support.
- A special honorary award was also presented to Professor Leopold Kohr from Austria, whose writings on the effectiveness of small autonomous units in the solution of human problems inspired the 'small is beautiful' movement.

\* New York Times Book Co., 1979

Swedes) towards unachievable 'international safeguards'. In contrast, in a world without nuclear power, the means needed to make bombs by any known method would no longer be items of commerce. They would therefore be hard to get, conspicuous to try to get, and politically very costly to be caught trying to get, because for the first time one's purpose in wanting them would be *unambiguously military*. This would make proliferation, not impossible, but extremely difficult.

What stands in the way is the unwillingness of nuclear bureaucracies (and of the governments they often control) to abandon their hope of profit and personal satisfaction—neither of which has materialised—from subsidised exports of nuclear technology, notably to developing countries. In fact, nuclear power is dying of an incurable attack of market forces throughout the world's market economies. New plants are so uneconomic that even if built, they would cost less to write off (and buy energy efficiency instead) than to operate. Indeed, it can easily cost a nuclear utility more to build the capacity to serve a new, electrically heated building than it costs to construct that entire building!

Simply choosing the cheapest energy options can guarantee a non-nuclear future, regardless of personal preference or ideology. This is already starting to happen. Since 1979, for example, the United States received more than a hundred times as much new energy from savings as from all expansions of energy supply; more new supply from renewable sources than from nonrenewables; and more new electric generating capacity ordered from small hydro plants and windpower than from coal or nuclear plants or both. (No large power plants of any kind have been ordered in the US since late 1981; and the nuclear programme, the world's largest, still delivers only about half as much energy as wood.) Yet successive US Presidents have ignored these market realities and instead propped up tottering nuclear programmes abroad by the bad example of their domestic energy policies. By saying that even a rich, skilful nation, rich in all sorts of fuels, cannot survive without nuclear power and a

plutonium economy, the US has reinforced similar arguments in other countries lacking those advantages. If the US were simply to accept the verdict of the market, abstain from heroic measures to resuscitate a failed technology, design an orderly terminal phase for it, help a very imperfect market to work better in choosing cheaper alternatives, and help any other interested country to follow that good example, the world's remaining nuclear power programmes—all in serious trouble—would soon wither.

The Swedish example in pioneering this sensible course is of critical worldwide importance for nonproliferation. A modern, highly industrialised country with no fossil fuels of its own has set out to abandon nuclear power by 2010 in favour of very efficient energy use and appropriate renewable sources: just the options which will save the most oil soonest and cheapest. Sweden's success in continuing to move in this direction will be a vital beacon showing other countries the way, just as the efficiency of using energy in Sweden today—probably the world's highest—is the universally cited example of what can be done by a cost-conscious and practical people. But the global nuclear industry so fears the persuasive power of the Swedish example that it has misrepresented the result of the referendum as a resounding endorsement of the nuclear future. Sweden's greatest contribution yet to world peace could be simply to proclaim what actually happened—that seventy-eight per cent of Swedish votes were for phasing out nuclear power in favour of alternatives—and to reinforce the national commitment to making that shift a model of smooth and efficient management.

That commitment to an efficient solar Sweden will increase national security, too. Today's complex, centralised energy system is very easy to turn off, through sabotage, natural disaster, or technical accident. In contrast, a more efficient, diverse, dispersed, renewable energy system could be so resilient that major failures would become impossible\* and very high energy productivity, in partnership with renewable sources, could guarantee

all Swedes an ample, sustainable, stably priced supply of energy, not just in our own generation, but indefinitely.

### Achieving Security

A secure and affordable supply of energy, however, is just one of the ingredients of a really secure society. Security also requires other necessities—water, food, shelter. It embraces health, a healthy environment, a flexible and sustainable system of production, a legitimate system of self-government, a durable system of shared values. But where can we get these things which so directly touch our lives and let us all feel safe? Most of all from the institutions nearest to us: from our own efforts, our families, our communities, our local governments. Real security comes less from central governments, dispensed from the top down, than we build it ourselves from the bottom up. But we cannot feel secure if we enjoy Life, Liberty, and the Pursuit of Happiness while others do not; for then at best we will feel uncomfortable, and we may even fear that others may come to take from us what they lack themselves. Thus we build real security above all when we strive to make our neighbours feel *more* secure, not less—whether on the scale of the village or the globe.

Real security, too, is not something we can get from armies and missiles. Its roots run deeper and need greater nourishment. It thrives for example, on a political system so firmly based on a common set of values—honed by diverse and vigorous debate—that it cannot be subverted or taken over. On such foundations could even be built, as some Scandinavian strategists have suggested, a standing Resistance that would make one's national territory impossibly disagreeable for anyone else to occupy. Such a purely defensive military posture is cheap; threatens nobody; cannot be perverted into an instrument of oppression; and can even guard against tyranny at home. Such nonmilitary approaches to

\* See A.B. & L.H. Lovins, *Brittle Power: Energy Strategy for National Security* (Andover Massachusetts: Brick House, 1982). FOA has done a broadly similar analysis for Sweden, apparently with parallel conclusions.

military problems are an idea whose time is coming fast—and are yet another contribution that Swedish thinking is making to world peace.

From the analysts at SIPRI, to the grassroot activists (such as C.E. Lennart Daléus) who conceived and carried forward the nuclear phase-out referendum, to such courageous advocates of disarmament as Inga Thorsson, many Swedes are contributing to the global ferment of fresh ideas on how to *unspread* the bomb. Here is a sampling of the wide range of new ideas from around the world on nuclear disarmament:

- Since merely reversing the arms race (i.e. decreasing, instead of increasing, the number of bombs by 4-5%/y) would take 100-200 years to get rid of them, destroy them instead at a rate which increases exponentially. President Reagan, having a flair for the dramatic, could take a Mark 12A warhead to the Nevada Test Site and, on world television, pulverise it with a big sledgehammer—then invite President Andropov (or perhaps a more robust substitute such as Chief of Staff Ogarkov) to do the same with *two* Soviet warheads, then four American, eight Soviet, etc.
- The past six US Administrations (until this one), have been committed to a Comprehensive Test Ban, but this has always been vetoed by the weapons laboratories. That is because most modern bombs are perishable—they contain tritium and plutonium which decay—so that in time they can no longer be assured of working, unless each vintage has from time to time been taken off the shelf and proof-tested. The US (and perhaps also the Soviet) arsenal is therefore, we are told, to be gradually shifted to all-uranium designs which have an indefinite shelf life and thus need no testing. But we prefer a Comprehensive Test Ban *and* perishable bombs (on both sides). As the bombs gradually rotted, they would still deter—one could not be sure they would *not* work—but they would become less and less likely actually to work, so everyone would become safer. A “let ‘em rot” policy—coupled, of course, with a comprehensive bilateral freeze so that replacement bombs could not be built—would especially deter a first strike because it would greatly reduce the attacker’s confidence of success.
- Our friend and colleague Dr Donald Westervelt, who for many years ran the bomb-testing programme at Los Alamos National

Laboratory, points out that it is, and will remain, very difficult to get Superpower agreement about “bean-counting” types of nuclear disarmament (who has how many of what). He therefore proposes building on the existing consensus that short launch times and short warning times are dangerously destabilising. In nontechnical form, Dr Westervelt’s creative proposal for *lengthening* launch times would be, for example, to take missiles out of their silos, unbolt the wings from bombers, withdraw all missiles and other nuclear bombs from forward bases (e.g. in Europe), build no means of communicating with submarines much faster than floating them messages in bottles, etc.—and do all of this bilaterally and verifiably. This approach has substantial military support (the generals are very scared by launch-on-warning too), but no political leader has yet picked up the idea.

- Visits and exchanges by private citizens could be supplemented by a formal revival of the mediaeval concept of mutual hostages: members of the Congress and of the Politburo could send their children to live and study in the other country’s main cities.
- The biologist Lewis Thomas proposes that large numbers of US and Soviet troops be given tickets to ride around all the time on each others’ railway systems. The revenues would revitalise the railways. Because of the well-known imperfections of railway timetables, nobody would ever know quite where the soldiers were. And as these roving hostages looked out the windows, and discovered that Nebraska and the Ukraine are quite alike, they would recall—as their commanders might have forgotten—that there are *people* out there.
- In a similar vein of rehumanising the so-called “enemy”, there is a new programme which arranges for each American family to keep on the mantelpiece of its house the photographs of a Soviet family, and vice versa. There is also a “sister-cities” programme.
- The Brandt Commission proposed, and Sweden could unilaterally start paying, a rising international tax on arms expenditures. How about a rising megatonnage tax, too, to be paid in an annually televised ritual of penance (preferably in Hiroshima or Nagasaki) and distributed to countries without nuclear bombs, as a symbolic, if wholly inadequate, gesture of compensation for the risks imposed on them?
- Better still, every August, each in-

coming head of state taking office during the previous year, and each head of state of a country having nuclear bombs, should be invited to make a public pilgrimage to the Peace Museum at Hiroshima as guests of the Japanese people. The visitors could see the exhibits, lay wreaths, condemn bombs as a matter for shame rather than pride, and perhaps skip away for a private meeting of Bombaholics Anonymous.

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**Nuclear bombs are not the problem; they are only a symptom. The problem is war, the legacy of tribalism, human aggression, injustice, power without a purpose, the psychic premises of eons of homocentric, patriarchal, imperial culture.**

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The anthropologist Mary Catherine Bateson offers the parable of a man who has the habit of drinking himself nightly into oblivion and who, perhaps once a year, gets out his revolver and plays solo Russian roulette. He is killing himself in three ways: the annual gamble with instant death, the slow death of cirrhosis, and the daily rejection of the reality of his being. But these three modes of death feed on each other. When the revolver clicks on an empty cylinder, he thinks he is all right and continues to drink himself to death. He doesn’t think too much about what the alcohol is doing to his body because of his overwhelming fear that the Russian roulette will kill him first. The daily oblivion that this fear compels him to seek keeps him from noticing the creeping cirrhosis or resisting the temptation of the revolver. And so the three go round and round, despair reinforcing itself. In our own world, perhaps once a year, various nuclear alerts are proven false and the nuclear gun doesn’t quite go off. We kill ourselves slowly with chronic privations and pollutions, to which we deaden ourselves with the electronic oblivion and ‘entertainment’ to which our fears drive us. These too feed on each other, and the steady revolving of the insane merry-go-round can be jammed only by minute particulars or work and hope. But first, like the alcoholic, we must face the depth of our addictive predicament. Breaking the numbed silence of dread will require new rituals, new symbolisms,

and above all new actions by millions of ordinary people.

This is not to deny the deep divisions in the world—least of all those between Soviet and American leaders, who seem to deny their common humanity and to share only a preference for their own people alive to the other's people dead. But these hostile, suspicious, fearful leaders will have to live together whether or not they trust each other. If, after all, they could trust each other, there would be no need for arms control, because there would be no 'need' for arms. And our leaders, like all of us, had better start getting used to the idea that nuclear bombs are not the problem; they are only a symptom. The problem is war: and, underlying war, the legacy of tribalism, human aggression, injustice, power without a purpose, the psychic premises of eons of homocentric, patriarchal, imperial culture. If we as a species do not squarely address these problems, nuclear disarmament will only buy time before we find some other ingenious way of killing each other.

The transformation of human values that can alone provide lasting security can only come from within each of us. It begins with you and me as we talk to each other and then to others. That is exactly how, for example, the Zen poet Gary Snyder stopped the war in Vietnam. In the

mid-1960s, Gary was sitting in a bar in Tokyo and fell into conversation with a fellow American who was on his way to Saigon to do a government study of war. The stranger was so surprised and fascinated to find that Gary thought the war was a bad idea that he postponed his trip to Saigon and they talked for three days about the war, about values and philosophy. When they parted, Gary didn't think much more would come of it. But some years later, having moved back to California and lived in several places, Gary heard on the grapevine that someone on a motorcycle had been looking for him, chasing from one old address to the next. The searcher had finally sent forward a message to Gary, saying "I'm the guy you met in that bar in Tokyo. That conversation changed my life. Watch your newspapers." A few weeks later, the Pentagon Papers\* story broke. The guy was Dan Ellsberg.

It matters to whom you talk. It matters that you care. Peace will break out when enough of us have peace in our hearts. Peace will blossom when enough of us ask ourselves each night, "What have I done today to help my neighbour feel more secure?—and when we like the answer. We shall have peace—when we each take personal responsibility for it.

Within your genes and mine is the

legacy of thousands and millions of years of biological wisdom, evolving unbroken to this day. Within your genes and mine is the heritage of all children yet unborn, their potential for all time entrusted to our stewardship. Let us, in their name, choose life.

*\*These voluminous secret papers, "leaked" by RAND Corporation researcher Dr Ellsberg, revealed to the American people for the first time how their government had systematically lied to them about the war in Vietnam. Publication in major newspapers, over the government's objections, was crucial in creating the political consensus to end the war.*

Amory Lovins is the founder of the International Project for Soft Energy Paths and vice president of the Friends of the Earth Foundation. Educated at Harvard and Oxford he is a consultant physicist concentrating on energy and resource policy. He has delivered energy briefings to President Jimmy Carter, the prime ministers of Canada and Sweden, and the chancellor of the Federal Republic of Germany. His article "Energy Strategy: The Road not taken" in the October 1976 issue of Foreign Affairs became the most requested reprint in the journal's history.

Hunter Lovins is a lawyer, political scientist, sociologist, and forester. She helped to establish the California Conservation Project and served as its assistant director from 1974 to 1979. She has co-authored three books and numerous articles with her husband, Amory.

They are now establishing the Rocky Mountain Institute to focus on (1) making soft energy accessible (identifying the reasons why it is not spreading faster despite its clear economic and other advantages), (2) financing the energy transition, (3) redefining the basis of national security and (4) analysing the water/land/energy problem, applying to water policy the same mode of "end-use" and "least-cost" analysis with which they revolutionised the energy debate.

## Reflections over Tasmanian Dam

I have just noticed a letter published by *The Times* on 20.1.83 by that prestigious ecologist Professor Kenneth Mellanby. It is on the subject of the Franklin River Dam in Tasmania.

Mellanby says: "We all wish to make the greatest possible use of renewable energy which does not deplete fossil fuel stocks and does not pollute the atmosphere. Here, hydroelectric power is ideal—if it does not cause other, unacceptable effects.

"Some of the protesters have said that the same amount of electric power could more easily be produced by burning Tasmanian coal. Without the introduction to a coal-fired power station of expensive modifications which could still present difficulties this would contribute to the acid rain problem, something about which I am sure the protesters are equally concerned. Acid rain might be controlled, but increased coal-burning would undoubtedly add to atmospheric carbon dioxide. This is probably the most difficult and controversial problem facing mankind. It may be totally unimportant; it may be by far the most dangerous pollution problem, possibly, and in not so many years, causing widespread flooding of farmland and cities and dramatic changes which could turn food-producing countries into deserts."

Needless to say he is not at all convinced that the building of the dam should be stopped. It might cause damage, but, "I should like to be certain" he writes "that the environmental damage caused by not building the dam could not be greater." The reason given is that one should "make the greatest possible use of renewable energy which does not deplete fossil fuel stocks and does not pollute the atmosphere." If the good professor had any knowledge whatsoever of hydroelectric energy he would realise that it is *not* a renewable source. The reservoirs behind the dams tend to silt up in anything between 10 and 200 years. Once they have silted up, they are no longer any use and have to be abandoned. As it happens, there is a limited number of sites suitable for large dams, once these have been exploited (which is already much the case in many countries) hydro-electricity will be a thing of the past.

The good professor also seems to be ignorant of the extremely serious environmental and social cost of hydropower which we shall soon consider in a special issue of *The Ecologist*.

Edward Goldsmith



Kalimantan, Indonesian Borneo; the soil has been made friable and is ready for planting.

# Getting the Right Feel for Soil:

## Traditional Methods of Crop Management

Folk knowledge in the tropics, including experience of colour of soil, its taste, the wild plants it supports and topography have led to wise management and to optimising yields. That experience should not be passed over just because it does not fit in with modern agroindustrial methods.

Many agricultural and social scientists working with traditional farming systems around the world have been concerned with improving indigenous agricultural practices. This improvement has primarily been based upon instituting western models of efficient agriculture in place of traditional ones. A major reason for this has been an implicit if not explicit belief that western agricultural knowledge is superior. The numerous incidences of failure in implementation of Green Revolution technology over the past decade only need be pointed out to indicate that western technology is not always superior to traditional agricultural practices. There exists a need to take a closer look at traditional farming systems, especially those in the tropics, so that better insight can be gained into the ways in which they function. Fundamental to gaining this insight are studies of agricultural folk knowledge, or knowledge that traditional farmers possess about their agricultural practices.

One facet of agricultural folk knowledge which I wish to look at more closely here is the knowledge that traditional farmers have of the physical environment and the soil that they cultivate. I have focused upon what I call indigenous soil classifications, or the distinctions made by farmers among the soils

which they use. Ultimately these distinctions indicate where a farmer locates his fields, what crops he plants and where, and what are the agricultural potentials of various soils.

Indigenous soil knowledge and classification systems vary greatly from the vague to the highly specific. Often it is difficult to uncover the full nature of soil knowledge in traditional farming communities since it may take unsuspected forms. To assist the field researcher in uncovering and understanding indigenous soil knowledge I have proposed below a simple dichotomy, the physical dimension and the perceptual dimension. This division is not absolute and thus the examples provided here may cross the divisional line.

### The Physical Dimension

In determining what criteria farmers use as the basis for differentiation of soils those of the physical dimension are the most readily observable. These cover physical characteristics of soils that can be determined by sight, feel or taste. A simple example of this was recorded by Redfield and Rojas in their study of the Maya village of Chan Kom in the Yucatan Peninsula of Mexico.<sup>1</sup> In Chan Kom the people divided all soils into four groups on the basis of colour and location: *kan*

*luum* (yellow soils), *ek luum* (black soils), *hayan kan luum* (red soils) and *cacab* (stony soil under palm trees).

Texture and structure are additional physical criteria often used in differentiation of soils. In *Hanunoo Agriculture*, Conklin's well known study of swidden agriculture in the Philippines, an excellent example of this can be found.<sup>2</sup> The eight categories of the Hanunoo soil classification are:

1. moisture content
2. sand content
3. rock content
4. general texture
5. firmness
6. structure
7. structure in the wet season
8. colour

Other physical dimensions in more elaborate classifications include taste and vegetative cover as indicators of soil fertility. Malaysian farmers categorise soil on the basis of taste: *tanah payau* (sweet soil), *tanah tawar* (neutral soil) and *tanah masam* (sour soil). These "tastes" relate fairly accurately to the western concept of pH levels with "sweet soil" having a high pH level, "neutral soil" having a neutral pH level and "sour soil"

\* This paper is a revised edition of one originally prepared in early 1977 for a Cornell University seminar on tropical agriculture.

having a low pH level. The same farmers cited certain vegetation as indicators of soil fertility. The *keduduk* bush (*Melastoma malabathricum*, Linn) indicated the probability of high levels of aluminium in the soil, the tree *pohon bakan* (possibly *Hanguana malayana*, Merrill) indicated an acid soil with stagnant standing water, and *lalang* grass (*Imperata cylindrica*, Beau), *keriang* berry bushes (possibly *Ploiarius alternifolium*, Melchior) and cashew trees (*Anacardium occidentale*, Linn) indicated soils of low fertility. Most important of all, Malaysian farmers recognize the blue-green algae in their flooded rice fields as an indicator of fertility.

Slope, elevation, drainage and water retention properties of soils are other criteria in the physical dimension. In Brazil *chapadas* soils are defined as soils on an elevation of about 1000 to 1200 metres with slopes of 0 to 3 per cent, while Andean high altitude soils are known as *paramo* soils.<sup>3</sup> Drainage is recognized as a potential problem by most farmers and water retention properties of a soil are critical criteria for flooded rice farmers.

### The Perceptual Dimension

This dimension is a catchall for criteria which are not as concrete as those in the physical dimension, nor are they readily recognized as soil characteristics. Possible perceptual dimension criteria are numerous but



Taking considerable labour to clear, stands of bamboo are desirable sites for swidden gardens since the vegetation dries rapidly, burns well and produces an ash high in lime.

are difficult to uncover during field research. Three that I have encountered in the literature are termites, temperature and catena. Malcolm reported that the Sukuma people of the Lake Province in Tanganyika (Tanzania) have two divisions in their soil taxonomy based upon termites.<sup>4</sup> The first, *kibandagula*, are the low or flat termite mounds made by a small species of white ants. These mounds have become spread out due to erosion. The second, *kigula*, are higher termite mounds which, as *kibandagula*, are important as a source of lime fertiliser for acidic soils. Malcolm also found that Sukuma farmers use the concept of catena as a fundamental part of their cropping practices.<sup>4</sup> They recognize the series of soils, or catena, found on granite, sand-producing metamorphic rocks and loam-producing metamorphic rocks in planning where to grow different crops.

In parts of Mexico, Hernandez encountered farmers who referred to their soils as *caliente* (hot) or *frio* (cold).<sup>7</sup> The reference to hot or cold was not to actual temperature calibrated in degrees but to relative fertility. The concept of hot was in recognition of high soil fertility relative to cold as recognition of low soil fertility.

Non-agricultural perceptual dimension criteria include those based upon soils used for building materials, pigments and salt gathering. Recognition of specific soils which are good for making bricks or pottery is widespread throughout the world. Likewise certain cultures highly prize natural pigments derived from specific soils. Ollier, *et al.* found such a case among the Baruya of New Guinea whose classification system contained a major category devoted to soils used for pigmentation.<sup>5</sup> Another category of the Baruya soil classification was salt grass soils. These soils were the ones upon which special reeds (species unknown) grew. When these reeds were harvested and burnt the ashes could be leached to produce sticks of crystalline salt.

Another aspect of the perceptual dimension is the division of soils on the basis of work input/yield output. A swamp soil may have more agricultural potential than an upland soil

but be classified as less desirable due to the greater amount of labour necessary to make it productive. In my research in the interior of Kalimantan (Indonesian Borneo) I often encountered swidden farmers who travelled far inland from their villages on the banks of the river seeking dry uplands rather than attempt to cultivate the riverine swamps nearby. Hillside swidden sites needed only to be cleared of timber for productive use while riverine swamps, although offering a potential for highly productive flooded rice production, required a great deal of labour for drainage and water control.

### Cropping Practices and Indigenous Soil Classification

The most obvious reason for differentiating soils is to determine their relative agricultural potential. This may take the form of general fertility categories as in the cases of the Mexican hot/cold dichotomy or the Malaysian sweet/neutral/sour divisions. General fertility categories play an important role in the location of fields and the establishment of agricultural communities, but of greater significance is the crop specific use of various divisions within indigenous soil classifications.

In the Trobriand Islands where yams and taro are the dietary staples, soils are usually evaluated in terms of their potential for these two crops. An example of this was cited by Malinowski as follows:<sup>6</sup>

1. *galaluwa*—black, heavy soil, dry and perhaps good for all cultivation.
2. *butuma*—red, light soil found nearer coral ridges, unsuitable for taro but excellent for yams.
3. *kwala*—black soil near wooded coral reefs, very fertile and good for all crops.
4. *dumya*—greasy swamp soil, in dry season good for taro, but never suitable for yams.
5. *sawewo*—soil found in holes of the wooded coral reefs, suitable for large yams.
6. *malala*—poor stony soil, unsuitable for taro, but good for hardy yams and taytu.

The Baruya of New Guinea also evaluate soils primarily in terms of their use in growing yams and taro but soils supporting salt bearing reeds are also important since the Baruya have no other source of salt.<sup>5</sup>



Although fertile soil, this small swamp directly behind the village had long been ignored due to the amount of labour required to cultivate it. Lacking local land rights, a government employee has only recently begun to cultivate wet rice here (centre right of photo).

The tremendous degree of crop specificity that can occur in an indigenous soil classification is well exemplified by the Sukuma. Their system contains detailed ranking of soils in terms of potential uses for the cultivation of twelve different crops.<sup>4</sup> In addition the Sukuma system has divisions for termite soils, soils used for pottery, soils used for salt extraction and soils considered unfit for agricultural use.

The examples provided here are by no means exhaustive; the possible additions, variations and combinations are tremendous. The purpose of these examples is to show the potential scope of indigenous soil knowledge and soil classification systems.

### Traditional Soil Management

Manuring is a widely accepted soil management practice among farmers in both the developed and underdeveloped world but there occurs a broad range of practices and beliefs associated with it. At one end of the continuum of manuring practices can be found the Hanunoo. Conklin noted that although the Hanunoo did not intentionally put manure on their fields, they were cognizant of the value of incidental manuring that occurred when cattle grazed in second growth swidden areas near the village<sup>2</sup>. In this instance the cattle were considered more important in their capacity as grazers thus retarding the spread of *cogon* grass (*Imperata cylindrica*, Beauv.). At the other end of the continuum are Mexican and Malaysian farmers who not only use manure on their fields but rank different manures according

to their perceived fertility values. In their perception of "hot" and "cold" mentioned earlier, Mexican farmers include manures. All manures are believed to "warm the soil" but to different degrees. Chicken and hog manures are believed to warm the soil the most with decreasing heat values assigned to other manures, ending with fresh cow manure at the "coolest" heat value. In contrast chemical fertilisers are perceived as cooling a soil. The seeming disparity between manures warming the soil and chemical fertiliser cooling the soil is rationalised by the fact that yields decline when the application of chemical fertiliser is stopped, whereas yields tend to remain stable when manuring is discontinued since manure releases its nutrients slowly over a period of several years.

Malaysian farmers, like Mexican farmers, also show definite preferences in their choice of manures. Bat guano is highly prized for use on flooded rice fields while chicken manure is never used, and goat manure is not highly valued. Goat manure is considered relatively inefficient due to its long decomposition rate, while the preference for bat guano has been born out by chemical analysis showing it to have a high calcium content. Chemical analysis of chicken manure has shown a high level of manganese which is believed to be detrimental in rice production thus justifying the rice farmer's aversion to its use.

Mulching is another important aspect of traditional soil management. The Hanunoo mulch their perennial banana groves during harvesting but assiduously avoid

leaving crop wastes in their grain swiddens. Mulching may be a positive factor in arid and temperate regions for it helps to conserve soil moisture but in the humid tropics mulching can have adverse affects. According to Conklin, the Hanunoo, "... clear all maize stubble and shocks to keep their swidden free of rats and other rodents and to maintain sufficient openness for drainage and sunlight during the last part of the rice growing season".<sup>2</sup>

In Mexico after the ears of maize have filled out the tops and leaves of the plants are cut off and fed to cattle. When there are more tops and leaves than can be consumed by the cattle they are left in the field as a mulch and an addition to the organic matter content of the soil. This is a particularly important practice when potatoes are to be planted in the same field after the maize has been harvested. Since potatoes are planted during the dry season the additional soil moisture retained due to the added organic matter can become a decisive factor in years of drought. According to Hernandez, the Maya of southern Mexico are keenly aware of the influence of organic matter content in their soils.<sup>7</sup> In the Mayan soil classification system a *yashom* soil is highly desirable, this being a dark colour soil with an A horizon containing up to ten per cent organic



Made friable by the swidden fire, this soil can be planted easily with dibble sticks alone.



Three hours by canoe or foot from the village, this site is desirable since the soil is good and simple swidden technology of slashing, burning and dibble stick planting can be used.

matter. Aside from the colour of the soil itself, darkness is also inferred from the dark green colour of the vegetation found growing on a *yashom* soil. Organic matter content of this soil is maintained through composting of vegetative matter and manures.

Countless other examples of traditional soil management practices including erosion prevention, fallowing and rotational planting could be cited here, but only two more examples will be given. These two have been singled out since they are prime examples of successful indigenous practices which run contrary to western agronomic advice. The first occurs in Malaysia where flooded rice cultivators plant at a density greater than that recommended by western experts. The farmer's rationale for overplanting is that he has to do so to offset the amount of damage he expects to sustain due to rodent infestations. When the fields are viewed near harvest time they indeed come close to the recommended plant density. The second example occurs where Mexican farmers plough their fields up and down the slope rather than on the contour. Contour ploughing had been recommended to prevent erosion on the slopes but in this instance it caused more harm than good. Due to climatic conditions of certain areas of Mexico where the dry season is followed by torrential rains, farmers have found that ploughing up and down the slope allows better permeation of

rainwater and discourages water build-up. When contour ploughing was tried, particularly terracing, water built up on unstable slopes causing landslides.

### Potential of Agricultural Folk Knowledge

The study of agricultural folk knowledge, of which indigenous soil classifications is a part, offers great potential for social scientists and agricultural scientists alike. This potential lies in a more complete understanding of the intricacies of traditional farming systems. As the African British Civil Service agronomist Malcolm discovered over thirty years ago, "Innovation, however desirable, introduced without the goodwill and cooperation of the people may have an apparent ephemeral success, but it is quite another matter . . . to influence the daily lives of the people to the extent of obtaining the adoption of improved ways and means into accepted permanent customary practices."<sup>4</sup> Actual implications of indigenous agricultural knowledge for agricultural development will vary from place to place but such knowledge needs to be fully explored prior to attempting to institute change. A traditional farmer is not an empty vessel waiting to be filled with modern western knowledge; any new knowledge added displaces prior knowledge which often is more ecologically and sociologically attuned to the physical and social realms in which the farmer operates.

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### Photographs:

All of the pictures were taken by the author and were from the interior of Central Kalimantan (Indonesian Borneo) and of the Luangan Dayaks.

Dr Weinstock has a doctorate in Development Sociology from Cornell University. He has travelled and worked in Southeast Asia, the most recent being eighteen months studying the Luangan Dayaks, a tribal group of swidden cultivators inhabiting the equatorial rainforest of Kalimantan (Indonesian Borneo).

Presently he is a research fellow with the Environment and Policy Institute of the East-West Center in Honolulu, Hawaii, where he is working with issues of agroforestry and agroecosystems in the tropics.

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# The Success of Javanese Multi-Storied Gardens

by Peter Freeman and Tomas Fricke

Java has a rainfall of 2000-4500mm per year, with a natural vegetation of broadleaf Podocarp evergreen trees. The soils are basically Latosolic Upland Volcanic Clays and Loams. The Javanese traditionally practise shifting cultivation in those upland areas where paddy culture is impractical. The authors show that the multi-storied garden is a highly productive, stable system for food growing in such tropical areas.

Although small, permanently cultivated home gardens are a familiar feature throughout Southeast Asia, the traditional multi-storied gardens of West and Central Java are ecologically distinctive because their structure approximates the ecological balance of mature forests<sup>1,2</sup>. In addition, fishponds are incorporated into many of these Javanese gardens, and function as repositories of nutrients and reservoirs of protein. Details and recent research findings of this centuries-old practice were presented recently at a World Bank development forum guest lecture by ecologist Dr Otto Soemarwoto, Director of the Institute of Ecology of Padjajaran University, Bandung, Indonesia. Dr Soemarwoto noted that traditional Javanese cultivators have evolved their methods in response to population pressures on a finite resource base.<sup>4</sup>

The Javanese multi-storied garden system can be basically characterised as a series of vegetative manipulation strategies that assure optimal soil conditions and nutrient

balance. Soemarwoto likens the process to "organised shifting cultivation in a man-made forest." This system is practised in unirrigated upland and hilly areas where the dominant paddy culture (*sawah*) is impractical. Expressions of the system, particularly the highly diversified home gardens (*pekarangan*) are found in lowland areas as well, and assured the virtually landless of a margin of survival in many instances.

The Javanese multi-storied gardening system employs forest/fallow rotations in upland areas unsuited to *sawah* cultivation. If land is not a limiting factor it is a more land-and-labour extensive system than the *sawah* system. Originally forested land is initially harvested and/or cleared in private or communal tracts adjacent to or within a reasonable proximity of established human settlements. Subsequently, a land use sequence is followed generally involving:

- Cultivation and cropping of upland rice, maize or cassava;
- Fallowing until a shrub forest (*tegal*) emerges;
- Selection of species and plantings for a managed forest (*talun*), generally with the dominant species of *Albizia falcataria*, *A. variculi formis*, and *A. sinensis*;
- Harvesting and establishment of

the semi-mixed garden (*kebun campuran*); and

- Clearing for a return to beginning of the 10-15 year cycle or conversion into the permanent multi-storied home garden (*pekarangan*). Some gardens have existed for centuries from the time the land they occupy was colonized and converted from natural vegetation.

The *pekarangan* constitute the most intensively-managed expression of this system, and feature a diverse array of species on multiple levels and a closed structure provided by tall fruit and timber trees. Pelzer (1945) distinguished three major levels or 'stories' of these gardens, a ground floor made up of tuberous shade-tolerant plants; a middle story of taller growing plants and small fast-growing trees; and an upper story formed of tall fruit trees.<sup>1</sup> During his World Bank lecture Soemarwoto presented preliminary lists of species composition for a typical *talun*, *kebun campur*, and *pekarangan*, and a diagram of plant associations in the various stages of the *pekarangan*. Mature coconuts are often the main cash crops. However, economic crops are found for all levels of plant growth: in the ground story, upland rice, maize, cassava, peanuts and cumin; in the mid-story, coffee, bananas, and papayas; on the higher levels; cinnamon, jackfruit,

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and other fruit trees, and various vine crops (pepper, vanilla, chayote, etc.) trailing up woody stems.

Many researchers have noted that the Javanese mixed gardens, particularly the *pekarangan*, constitute a stable agro-ecosystem if their species diversity and structural integrity is maintained.<sup>2,3,4</sup> The closed canopy structure of the gardens functions to "reduce the impact of rains on the soil, control erosion, reduce soil temperatures and the rate of mineralization, provide humus and control weed growth."<sup>5</sup> Pest outbreaks are rarely reported, in contrast to the paddy rice *sawah* system, nor do the Javanese mixed gardens require the substantial inputs of water, chemicals, and extensive labour which the modernized *sawah* system cannot do without.

Stoler (1975) observed that "the tiered plantings of gardens show a tendency toward ecological imitation of forest structures, rather than transformation of the environment."<sup>3</sup> She concludes that traditionally both the *sawah* and *pekarangan* systems were 'maintenance systems'—providing sustained yields and causing minimal environmental degradation under continuous use.

Accounts of the relative productivity of the mixed gardens and the *sawah* system vary. Most recently, Soemarwoto reports that in preliminary results from random village-based samplings, the managed forest (*talun*) virtually equals the *sawah* in terms of useable (presumably recoverable) carbohydrates produced per unit area (2,062 Kcal/m<sup>2</sup> versus 2,032 Kcal/m<sup>2</sup>), while the *Pekarangan* carbohydrate production is roughly that of the *sawah*.<sup>4</sup>

These figures do not reflect, of course, the relative monetary value of calories produced. It can be added that significant nutritional benefits (in the form of vegetable vitamins, minerals, and protein) are produced in the multi-storied gardens.

Recent statistics demonstrate the vital contributions in terms of income and nutritional value afforded to Javanese villagers by the home gardens.<sup>4</sup> According to Soemarwoto approximately ten to thirty per cent of total income, thirty-two per cent total protein and forty-four per cent total calories consumed are produced

by home gardening, generated by only eight per cent of total production costs and seven per cent of total labour expended per year. Stoler's (1975) account of the socioeconomic aspects of the home gardens, particularly the relationship between household income, land ownership patterns, and garden production is particularly revealing.<sup>3</sup> Poorer households in her study of the role of home gardens in a central Javanese village generally displayed the largest labour inputs and lowest returns to labour in all activities, and also the greatest diversity of occupations. Quite logically, a greater portion of the incomes and nutritional needs of poorer villagers were met by their home gardens. The wealthier villagers were characterised by progressively larger *sawah* (paddy) holdings, a narrower range of employment activities, and decreasing involvement in home gardening.

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**The Javanese multi-storied garden is an enduring system that provides regular harvests of food, fuel, fodder, fibre and medicinal products for the cash and subsistence needs of rural people.**

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The Javanese multi-storied garden is an enduring system that provides regular harvests of food, fuel, fodder, fibre and medicinal products for the cash and subsistence needs rural people. Both in nutritional and economic terms, the gardens have had a significant stabilising influence on Javanese communities. However the traditional system is now seriously under threat.

Indonesia's agricultural development path toward heavy reliance on fertilizer rather than on biological nutrient cycling has been propelled by phenomenal population growth and resultant rising food staple demands. Indonesia's resource population imbalance is also most pronounced in Java, which features the most densely populated rural areas in the world with areas of over 2,000 inhabitants per square kilometre (or roughly 500m<sup>2</sup> per person.)

Soemarwoto (1977) contends that increasing use of chemical nitrogen fertilizers in *sawah* rice production has

led to the increasing abandonment of organic fertilization techniques such as composting, green manuring, and use of fishponds to recycle human and livestock excrement.<sup>6</sup> He cites the environmental effects of eutrophication and decreasing biological nitrogen fixation as being associated with an increase of chemical versus organic fertilizer usage.

Conversely, the possibility of a proliferation of communicable diseases through organic recycling methods is a serious consideration. Water-borne cholera vibrio is the major disease, while schistosomiasis is relatively non-existent in Indonesia. Traditionally, during lesser population densities, public health problems associated with waste handling were minimized as the ponds or composting areas were removed from drinking water supplies. Low-cost on-site provisions for the prevention of contamination appear to be critical aspects of future efforts to consolidate or extend the Javanese multi-storied gardening system.

Careful consideration of socio-economic as well as environmental variables is required in addressing the potential and limitations of the Javanese multi-storied gardening system. Missen (1972) points out a qualitative difference between using a garden as a supplementary resource and living off its produce entirely.<sup>5</sup> According to Stoler, maintaining a garden ecologically and economically as a single income course would entail the use of high-risk, high-profit crops, more frequent care, and vulnerability to market fluctuations, particularly with tree crops.<sup>3</sup> Given the spectre of increasing poverty and population pressures in Java, however, an increasing reliance upon intensive subsistence gardening is very likely. Research may in fact determine cases where it makes better economic sense to propose conversion of *sawah* into *pekarangan*.

Over the last decade, the Javanese *pekarangan* has finally received serious attention from government policy makers.<sup>7</sup> Initially, most of the emphasis of development programmes focussed on possible species improvement without adequately investigating the structure of existing gardens. The Javanese mixed gardens have appeared to

many agronomists in the past to resemble a chaotic disarray of vegetation, devoid of the regularity and order of row-cropping and plantation monocultures. However, during his IBRD visit, Soemarwoto gave a clear example of the need for synchronicity between crop improvement research and ecological diversity.

His detailed ecological studies have brought the problems and potential of this system into sharper focus. His group at the Institute of Ecology has taken the lead in compiling agroecological data.<sup>8</sup> Several villages in West and Central Java have been extensively monitored; species composition has been analyzed and input-output calculations have been made.

In summary, it appears that the Javanese multi-storied garden system has the potential to play an important role not only in the densely populated areas of rural Java, but also in the transmigration and developing regions of Indonesia's outer islands.<sup>3</sup>

At the suggestion of World Bank environmental advisory staff, the Institute of Ecology may be invited by transmigration project officers to provide technical assistance to Bank-supported efforts. The success of further applied research and wider dissemination of the model in Indonesia would depend on a cooperative approach that involves scientists, extension workers, and rural farming families, as described by Harwood (IADS, 1979) and Benor (World Bank, 1977).

This successful family food production system provides an inspirational as well as technical model for small farmer developments throughout the tropics, especially where soils and climate are approximately similar. Several questions can be posed concerning the system's transferability, however. To what extent is its sustainability a function of the generally very productive soils developed over alkaline volcanic materials? Also, could this system exist in the absence of the demographic and socio-cultural context that characterizes Java? A crucial question could be the degree to which Javanese culinary preferences are an extension of the system and the possibility of their transferability or adaptation elsewhere.

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# Telling Them what They Want to Hear

by Charles W. Heckman

How authentic is the data compiled by scientists for evaluating environmental projects? The author suggests that scientists working for the establishment either set up their investigation to derive data to fit a preconception of what is required, or suppress those findings that would prove uncomfortable for those promoting projects.

Some ten years ago, I discovered a thick volume of raw data in the U.S. Agency for International Development (USAID) Library in Vientiane, Laos. This had been compiled to fulfil the legal requirements for a feasibility study to determine effects of a proposed mammoth dam across the Mekong River. At the time, I wondered how these data had been obtained as neither roads nor landing sites for helicopters were available at the sampling stations, and the hostilities at the time made river travel impossible. Nevertheless, a complete set of data for each fully inaccessible sampling site was included.

Recent conversations with scientists from South America informed me that much scepticism exists about the authenticity of data concerning the impoundments being formed behind giant dams being constructed with the support of the World Bank. The measurements and analyses are supposedly performed by private firms for enormous fees, and there is little chance that an impartial and independent organization would ever be willing to expend the enormous effort to check the accuracy of the recorded values. The World Bank is interested in winning public support for its projects, and the bankers will certainly not look very closely at data that tell them everything is fine.

The present system for obtaining permission to market a new product in the United States involves the performance of routine tests by a competent person chosen by the firm filing the application. Providing positive test results is clearly a good way for a commercial laboratory to please its customers and prosper. This seems to be a contributing cause to the wave of scandals involving data falsification<sup>1</sup>, for which the culprits are no longer ambitious young scientists faking great discoveries to enhance their prestige, but rather well established professionals making large amounts of money by performing numerous tests required for applications to the Food and Drug Administration, Environmental Protection Agency, or other regulatory agencies. For example, improper tests were involved in the certification of almost fifteen per cent of all currently used pesticides by the EPA<sup>2</sup>, and the system of review within that agency designed to

spot abuses quickly did not function at all. From recent disclosures, it has become evident that manufacturers and EPA officials frequently decided on approval before test results were acquired, and the data were produced simply as a *pro forma* fulfilment of the law.

A few decades ago, the professional ethics of a scientist and fear of losing his reputation among his peers would probably have inhibited him from taking part in such a system. Today, with about 100 qualified applicants for every available job in the biological sciences, it is easy to recruit a black sheep by offering lucrative research contracts. Perhaps the white sheep still predominate, but the system is certainly one that seems to reward unethical behaviour. For example, one man who provided falsified data to the FDA and probably to the EPA, as well, was not even disqualified for performing subsequent tests until the matter became public<sup>3</sup>, while the EPA under its former administrator kept private blacklists containing the names of prominent scientists reputed to be over concerned about environmental issues<sup>4</sup>. Similar blacklists of scientists that have come to light with great regularity have tended to include persons who expressed unwanted views rather than those found wanting in integrity<sup>5</sup>. Obviously, 'loyalty' and 'team spirit' are beginning to count more in government than professional integrity. As the former head of the EPA, Mrs Burford, said in explanation of why she had dismissed a number of scientists from an advisory panel: "Oh, no, they are good scientists, except we want our scientists and not their scientists."<sup>6</sup> A recent summary of the situation in the British journal, *Nature*, carried the provocative title, "Is Science Really a Pack of Lies?"<sup>7</sup>

## Suppressing unwanted Research

Extracting the data to support your conclusion is one side of the coin, the other is suppressing findings that speak against the desired conclusion. This is not too difficult for an agency that controls the disbursement of research funds. For instance, one prerequisite for assessing the impact of pollutants on natural ecosystems is detailed knowledge of the structure and

function of the component biotic communities before the initial exposure to specific pollutants. At a recent workshop, I saw a map of the United States with about five dots on it to indicate the sites of EPA-sponsored baseline studies of wetland ecosystems. Given the enormous variety of such systems within the country, that number of studies is shockingly inadequate. Obviously, the EPA does just enough to counter the charge that it is doing nothing at all.

Under the present circumstances, the suggestion that a particular substance or environmental change might harm human beings or wildlife can be dismissed with the question: "Where is your proof?" Proof cannot be supplied without investigation and by selective funding, ecological studies can be limited to abstract subjects, such as modelling, which yield no information about processes occurring in natural ecosystems now.

Certainly, there are many new products and chemicals that would turn out to be unobjectionable in every sense, but after a company has spent an enormous sum to develop a product for which a great demand can be generated, encouraging a thorough ecological evaluation is a risk. If a serious danger is found, the developmental costs would represent a total loss, whereas the discovery of the danger a few years after its sale had begun would permit the company to quit with a fine profit. Furthermore, for the researchers to be able to claim in all honesty that they knew of no danger, can be used in defence should there be any liability trials.

The mechanics of research suppression was demonstrated to me recently. During my earlier research in Thailand<sup>8</sup>, I became aware of the great importance of small fishes and aquatic invertebrates in rice fields and ditches as protein sources in the diet of the local farmers. Such organisms also form the chief protein source for much of the rural population in Africa and South America. Where pesticides were used to improve rice yield in Malaysia, the fish production in the waters showed a sharp decrease<sup>9</sup>. To test some simple models I had constructed that simulated pesticide effects on protein production in Southeast Asian waters<sup>10</sup> and to find out if the foods on the local markets contained high concentrations of the chemicals being sprayed, I drafted plans for an investigation to compare rice fields in Malaysia that had been sprayed with pesticides and similar but unsprayed habitats in Southern Thailand. I sent an application to the National Research Council for a Resident Research Associateship that would have enabled me to conduct the research. The National Oceanic and Atmospheric Administration informed me that the project was not in their field of interest, so I sent proposals to two EPA laboratories. The project should have been of interest to the U.S. Federal Government, and the EPA in particular, for the following reasons:

1. Much money is contributed by the United States to pay for pesticide applications in developing countries, and many of the substances prohibited for domestic use are still manufactured for export and sprayed under the terms of the aid programmes. This practice has recently been sharply criticized<sup>11</sup>;
2. The pesticides return to the United States with imported foodstuffs;

3. Migratory birds sometimes enter the United States heavily contaminated with prohibited pesticides<sup>12</sup>;

4. The World Health Organization estimates that there are about 5000 deaths among 500,000 cases of acute pesticide intoxication each year<sup>13</sup>;

Reviewers at two EPA laboratories evaluated the proposal, and one wrote: "The overall approach is reasonable. I have often wondered why more toxicologically related field work in developing countries where extensive application of pesticides occurs regularly has not been proposed or funded by EPA." He went on, "We are trying to determine how well routine toxicity assays (usually single species) predicts effects and effect levels in the field. Therefore, relevant field effects studies are quite important in providing the 'ground truth' against which standard toxicity assays can be compared." He concluded, "We do not have the funds necessary to support an NRC 'post-doc' in toxicology at this time."

The other reviewer recommended the proposal and enclosed a letter. It seems that he expected me to conduct the study without any financial support. The National Research Council informed me that the application I filed could not be considered by its committee because the EPA had denied having funds for associateship programmes, but suggested that the funds might suddenly become available if I changed the topic of my research proposal. Just a few days later, the Administrator of the EPA lost her job. One particularly serious piece of evidence against the proper functioning of her agency was a document anonymously sent to Senator Gary Hart, apparently reflecting the feelings of the top EPA management. Its general comment on toxic substance programmes was "Get rid of them all. All known by reputation as menaces . . ." <sup>14</sup> The connection between my research proposal that would never go before the National Research Council and the EPA top-level policy was clear.

As soon as the new administrator, Mr William Ruckelshaus, assumed his duties, I wrote him a letter to ask if there would be any change in the basic EPA policy. The answer indicated that there would not be. Furthermore, the estimated cost in the letter seemed extremely exaggerated. I do not understand, he insisted, how it could cost more than 30,000 dollars for the year, including transportation. Without doubt, the EPA must set priorities for its scientific research, yet clearly those are set not by the scientists ("I have often wondered why more toxicologically related field work in developing countries . . . have not been proposed or funded by the EPA") but rather by the lawyers and political appointees ("Get rid of them all. All known by reputation as menaces . . .").

Mr Ruckelshaus has headed both a company subject to regulation and the regulatory agency. Unlike his predecessor, he is very competent at dealing with Congress and the public. In the future, things will certainly go smoother at the EPA, but evidently the basic attitudes of the persons in charge will remain unchanged. Keeping the scientific community in line at a time when, unemployment is high is not too difficult for an agency with a great deal of money to distribute

for research. Indeed, the loss of jobs argument is now being employed extensively to counter demands for environmental improvement<sup>14</sup>.

Businessmen commonly consider environmental protection to be the job of the public relations departments, and perhaps under the present circumstances, they are right. Scientific tests that revealed the presence of many toxic chemicals in the flesh of fish kept in Saginaw Bay<sup>15</sup> were only conducted after extreme pressure was put on the EPA, while, on the other hand, money always appeared to be available for reorganizations, for films on the EPA's achievements, travel to international conferences by the EPA scientists, and for other activities that tended to convey an impression of dynamism and success to the public. The substitution of appearance for substance is a characteristic of the activities of most government agencies today.

To convey the best impression, scientists have to be prepared to present credible conclusions in support of what their sponsors believe. They may be honest but work in a field that touches on only part of a complex problem or they may be willing to produce results on demand. Meanwhile the agency or organization paying for their services must know that their testimonies will not contain any unwanted surprises to hurt their case at public hearings. Dr. N. Ashford, Director of the M.I.T. Centre for Policy Alternatives, stated: "Scientists are no more neutral than anyone else."<sup>16</sup> This statement contradicts the basic rule that to be a scientist, or at least to function as one, requires strict neutrality.

To prevent the 'selling out' to agencies and other organizations with vested interests, the scientists themselves should set the priorities for research before conflicts of interest arise. Decisions on future projects and the setting of standards for pollutant discharges could then be made on the basis of sound ecological knowledge rather than on opinion, as they are now.

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# Alternative Medicine— Alternative Society

by Alwyn Jones

The increasing interest in alternative or (w)holistic medicine should be seen not just as a critique of established medical orthodoxy, but as symptomatic of a much wider phenomenon: the dissatisfaction with a way of life characteristic of advanced industrial societies.

Medical practice, or any other human activity for that matter, cannot be fully understood other than against the background of particular social arrangements which give it its legitimacy. A particular activity is only acceptable socially if it is consistent with the broad system of values and beliefs prevailing in the particular culture. Thus a critique of a given human activity widely regarded as legitimate in the culture implies *ipso facto* a critique of the system of social values and beliefs by which that activity is sustained. But what are the values and beliefs which make existing medical practices socially acceptable, and which alternative medicine calls into question?

Epistemology is the branch of philosophy concerned both with an evaluation of the criteria which form the basis of claims to knowledge, and the techniques by which such knowledge is acquired. There are many forms of sources of knowledge—for example religion, folklore, myth, legend, poetry, magic, intuition, pure reason (metaphysics)—but in advanced industrial societies what has come to be known as 'science' carries such high epistemological status as knowledge that other ways of knowing are regarded as virtually unacceptable in consequence.<sup>1</sup> This has clear implications for the acceptance of modern medical practices as we shall see; but first it is necessary for us to explore some of the reasons for this belief in the superiority of scientific knowledge.

As many writers have argued it is René Descartes, the French seventeenth century philosopher, to whom we must turn in order to understand the philosophical foundations of scientific thought. Capra has made the point well in the following passage:

"The birth of modern science was preceded and accompanied by a development of philosophical thought which led to an extreme formulation of the spirit/matter dualism. This formulation appeared in the seventeenth century in the philosophy of René Descartes who based his view of nature on a fundamental division into two separate and independent realms; that of mind (*res cogitans*), and that of matter (*res extensa*). The 'Cartesian' division allowed scientists to treat matter as dead and completely separate from themselves, and to see the material world as a multitude of different objects assembled into a huge machine".<sup>2</sup>

This distancing of the thinking subject and an objective reality 'out there' is the framework within which Western scientific thought has developed. It is a fundamental presupposition of science that the mind, as an

independent entity, is able to experience and grasp objective reality through the senses. Moreover because it is assumed that objects in reality themselves have an independent existence—i.e. independent of the observing subject—it is possible to corroborate our observations of reality with those made by others. Such corroboration is made possible through the establishment of a set of experimental techniques (testing of hypotheses etc) which can be applied universally. As long as such techniques are adopted any single observation of reality can in principle be replicated and verified or refuted by an infinite number of observers.

It follows from this that what is, or what is not, a scientific statement is dependent on whether it can be submitted to this procedure. It is argued that a knowledge claim such as 'water boils at one hundred degrees centigrade' can in principle be subjected to such testability criteria and is therefore included within science. On the other hand the claim that 'God exists' is excluded from science because there is no universally agreed method by which its truth or falsehood can be assessed. Some philosophers have even gone so far as to assert that statements such as 'God exists' are meaningless because no objective basis for their verification can be established.<sup>3</sup>

It is my contention that it is this *method* of verification which gives science its ascendancy over other forms of knowledge in advanced industrial society. At the core of this method is the principle of analysis in which the scientist, through making observations of *selected* parts or elements of reality, seeks to uncover unusual causal connections between them within the framework of universally applicable laws and theories. Priority is thus given to the parts over the whole the presumption being that a knowledge of the whole can gradually be built up from a detailed understanding of the relationship between the parts. The model of reality which emerges from this is of a vast machine whose fundamental

characteristics can be understood by an analysis of its parts and the laws which govern their working.<sup>4</sup>

Leaving aside for the moment the problems to which such a mode of reasoning gives rise there can be no doubt, at least at first sight, that this approach to the acquisition of knowledge has been spectacularly successful. Much of this success is derived from the application of science in many spheres of life—for instance in medicine, engineering and space research. In short it is science's apparent ability to give humankind an increasing control and mastery over nature which has proved to be its strongest attraction. In the popular imagination, especially in the advanced industrial countries, and increasingly everywhere else, science has come to be equated with the only true knowledge and 'facts' which do not have the authority of science behind them are virtually written off as having no epistemological status at all.

### The Institutionalisation of Science

The institutionalisation of science as the only source of true knowledge has had considerable implications for an applied science such as medicine whose credibility has come to depend increasingly on its association with science. The scientific basis of modern medicine is reflected in its criteria for making diagnoses in which health is assumed unless there are *readily observable* physical symptoms in the individual which indicate the presence of disease. Such symptoms are the phenomena to be explained in the diagnosis and causal mechanisms are sought which themselves can be observed and shown, as far as possible through a scientifically controlled experiment, to be directly related to the disease in question. In the case of infectious diseases, for instance, Pasteur's discovery of malign bacteria gave both an explanation for a particular disease, and laid the basis for its control and possible eradication in the later development of vaccines and antibiotics. But more especially it set the practice of medicine firmly within the scientific paradigm, a process well expressed by Inglis in the following passage:<sup>5</sup>

"Civilisation used to be continually threatened by devastating pestilences—the bubonic plague, the sweating sickness, smallpox, cholera and many more . . . Nobody knew what caused them. For centuries the prevailing view was that they must be the instruments of God's wrath. Then for a time it was believed they were carried by miasmas: noxious emanations, invisible but pervasive . . . In the middle of the nineteenth century, however, medical science came up with the answer. Pasteur, Koch and their disciples showed how infections are carried from place to place, and person to person, by germs invisible to the human eye except under a microscope . . . This in turn enabled bacteriologists to provide immunity with the help of vaccines or, failing that, to find a 'magic bullet' . . . a drug specific to the disease, capable of routing the bacteria responsible."<sup>6</sup>

It will be clear from what is being said here that modern medicine emphasises the physical dimension of health because it is this dimension which lends itself most readily to observation, classification and quantification which are fundamental to the experimental techniques used in scientific analysis. A model of 'normality' can thus be established—i.e. a biological

organism in a perfect state of health defined almost exclusively by physical criteria. Any deviation from this model will indicate the scope and characteristics of a particular disease as manifested in its physical symptoms.

This almost exclusive use of biological concepts in what is, or what is not, regarded as good health makes it clearly amenable to scientific analysis. And it is this epistemological grounding which has given modern medicine power over its rivals. This power is exercised through the institutionalisation of a scientifically based medical training, and the emergence of the modern profession of medicine which recognises such training as the only criterion for the right to practise medicine. This is the medical orthodoxy now firmly established, and licensed by the State, in the advanced industrial societies. The process by which scientific medicine has achieved this dominance in the field of health care, and the implications of this for alternative medicine, are made clear by Kennedy in the following way:

"After all, doctors did not win their dominance in the field of medicine and healing without a struggle; and, having won it, and the power which goes with it, only with the greatest reluctance will an inch of ground be conceded. Not much more than 100 years ago, those whom we now call doctors competed with many others in the market place of the healing arts. Gradually, scientific medicine won the day in Europe and America. Doctors who chose this new route were licensed and organised themselves into a profession. From such a position of consolidated power, other methods of treating people, other approaches to caring and healing can be denigrated and ostracised as quackery, not only ill conceived, but wrong and possibly harmful. The term 'fringe' medicine is used as if there were a central core of proper medical care. Indeed, one of the most interesting social and political conflicts of the next decade will be the challenge of this view."<sup>7</sup>

The institutionalisation of scientific medicine has given doctors the power to ensure that their definition of health—i.e. the absence of physical symptoms of disease—prevails in the community as a whole. Moreover as the layperson is not privy to the jealously guarded knowledge and skills upon which medicine is based the sick person must submit him/herself—as a 'patient'—to whatever therapeutic administration is considered necessary to get the 'machine' back to work again. This mechanistic view of health, based on biological reductionism, fragments a broader perspective or definition of health which would include in addition to the physical, its spiritual, moral, social and mental dimensions. And it is these dimensions of health which, to varying degrees, are incorporated in those perspectives in medicine which, as Kennedy argues, have been disparagingly labelled by orthodoxy as 'fringe' practices or 'quackery'. Because the term 'alternative', normally used for such perspectives, has also attracted similar pejorative undertones, and because I believe it to be more apposite, I prefer to use the term 'holistic' to refer to those forms of medicine regarded as being outside medical orthodoxy.

### Holistic Medicine

It is obviously not appropriate for the various perspectives in holistic medicine (HM) to be discussed

in detail here. However I will attempt to identify what I believe to be the salient features of HM in order to show how it compares and contrasts with the orthodox approach.

Firstly the person is regarded as an autonomous participant in the healing process. In orthodox medicine the 'patient' is someone to whom something is done or administered—the very word 'patient' denotes this; whereas in HM the individual enters into partnership with the therapist. Obviously the degree to which this is possible will vary between the various therapies, but I think that it is true to say that instead of being a passive recipient of drugs or surgery the person will often become actively engaged in the restoration of his or her own health. This may involve a considerable change in life style, values and habits, and the efficacy of such therapies as Alexander Technique and Naturopathy, for instance, depend almost entirely on the person putting such changes into effect.

Secondly HM is non-scientistic. Much has been said in this article about the scientific basis of modern medicine wherein analysis is focused on the part rather than the whole. In consequence illness is reflected in the manifestation of physical symptoms relating to a particular part of the body—e.g. cancer of the liver, arthritis of the hip. In such circumstances treatment is primarily directed to the affected part of the organism. But such treatment does not take sufficient account of the connection between the disease and its environment, both internal and external, nor can its possible adverse consequences—such as the side effects of drugs—be

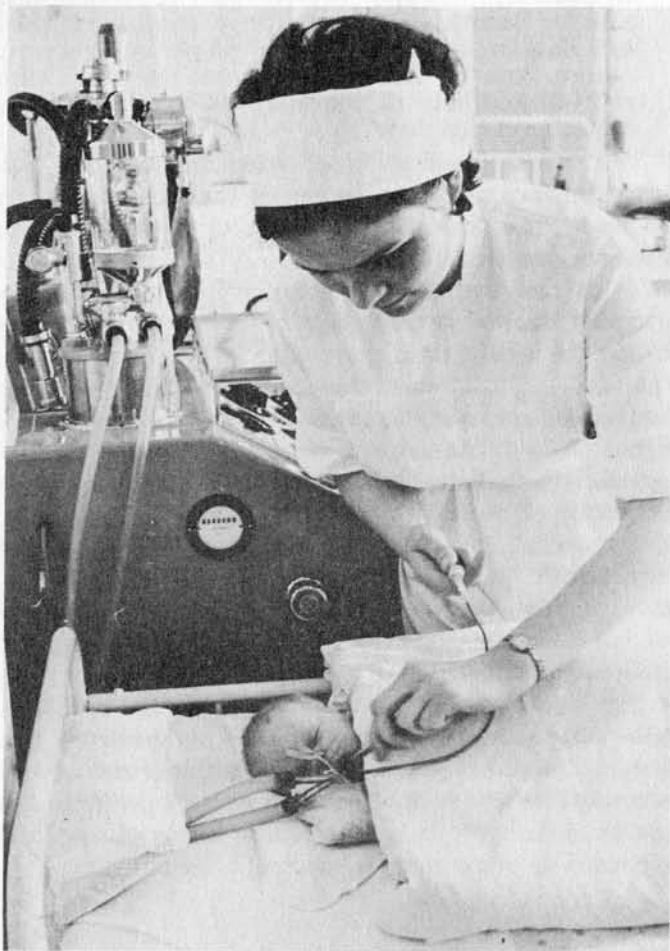
predicted with any degree of certainty. In HM, on the other hand, the aim is to treat the whole and not the part. In acupuncture, for instance, the assumption is made that there are channels or meridians in the body in which flow the 'ch'i' or energy force. Physical symptoms of disease reflect an imbalance in this flow of energy, and health is restored through the insertion of needles at various points along those meridians which connect with the part of the body in which the symptoms have occurred. Health is the state in which the 'ch'i' flows evenly throughout the whole body, and the acupuncturist seeks to ensure that this balance is achieved rather than treating any particular symptoms.

Thirdly the aim is to work with, rather than against, the body. Instead of using surgery to excise a growth, or a drug to destroy bacteria, HM seeks to stimulate the body's own defence mechanisms against disease. In homoeopathy, for instance, the medicaments used are based on substances which would give rise to similar symptoms in a healthy person. The original substance is diluted with spirit (1x99 progressively) in a special process and the drug is regarded as having higher potency the more it is *diluted*. In many instances a point of high potency is reached where no molecules of the original substance can be found! The principle here is that the body is equipped with an immune system designed to protect it against disease, and the aim of the homoeopathic remedy is to stimulate or boost this system, rather than to destroy what is believed to be the cause of the disease. An intuitive awareness of the delicate arrangements which *together* contribute to the overall health of an organism, and a desire to work and cooperate with these arrangements, is the philosophy behind this approach.

Fourthly the old adage 'the doctor has to be cruel to be kind' is completely inapplicable in HM. Instead of waging war on the symptoms of disease, often by using drugs or other techniques which can have serious and painful side effects, HM's approach is a gentle one with its practices being generally regarded as not having any harmful consequences. Indeed it would seem inconsistent with such practices, concerned as they are with the achievement of equilibrium in the organism as a whole, to use harsh or violent treatments which themselves could disturb such balance and harmony.

Fifthly HM treats each person as unique, and diagnoses try as far as possible to match the treatment with the particular circumstances of the whole person. In homoeopathic diagnoses, for instance, many highly specific questions are asked in regard to the attitudes, habits, life style and values of the person so that a complete personal profile can be built up which will provide the basis for the prescription of medicaments. Instead of prescribing a medicament to cure a generalised condition such as a cold or influenza, as in orthodox medicine, the homoeopathic practitioner will prescribe a *particular* medicament for the condition as it *manifests itself in the person to be treated*. Obviously homoeopathic diagnosis is extremely complex, but it must be very accurate if the treatment is to prove successful.

Finally a distinguishing feature of some perspectives in HM such as radionics, or various forms of psychic or



Modern medicine gets in on an early start.

faith healing, depend on the power of the mind to influence physical symptoms of disease. In some instances the afflicted person him/herself, rather than the practitioner, may be able to set a condition into regress, or prevent it from deteriorating, through such techniques as auto-suggestion or meditation.

Let me summarise what I consider to be the six main characteristics by which therapies in HM can be identified: (1) the person as an autonomous participant in the healing process; (2) its non-scientistic nature; (3) stimulation of the body's defence mechanisms; (4) the rejection of violent or harsh treatment; (5) each person to be treated as unique; and (6) the power of the mind in the therapeutic process. It must be emphasised again that the extent to which the various HM practices will display all or some of these characteristics will be dependent on the particular therapy used. However, I believe that these six characteristics reflect the holistic nature of alternative medical therapies in which there is a real resolve to go beyond the merely physical dimension of health.

### Holistic Medicine: prospects for the future

As we have seen the institutionalisation of orthodox medicine in advanced industrial society poses real problems for the general acceptance of holistic therapies. Although there is evidence that interest in such therapies is growing, people tend to use them as a 'last resort' after they have been told by their doctors that nothing more can be done for them. It is this somewhat negative approach to HM which needs to be broken so that there is genuine mutual respect across these frontiers of medicine.

But it is unlikely that such respect for HM will be forthcoming from medical orthodoxy until there is a fundamental transformation in the values and beliefs which underpin advanced industrial societies. A prime value orientation in such societies is an unequivocal commitment to *material* growth and progress, and science has had a pivotal role to play in this. The knowledge of the material world acquired through science has enabled humankind to achieve increasingly greater control and mastery over nature through the development of highly sophisticated technologies applied in many different areas of social life, such as medicine, agriculture and urban planning. These developments have meant the steady professionalisation of life in which experts have emerged in various spheres, operating from within vast bureaucratic complexes, distanced from each other and from the culture as a whole. Knowledge has thus become fragmented and placed under the control of experts who redefine genuine human needs as professional 'problems' to be quantified and resolved through the application of scientific rationality in their separate areas of expertise. But, as Illich shows in the case of medicine, this has occurred at the expense of the individual self-determination of such needs in meaningful and integrated social milieux:

"By turning from art to science, the body of physicians has lost the traits of a guild of craftsmen applying rules established to guide the masters of a practical art for the benefit of actual sick persons. It

has become an orthodox apparatus of bureaucratic administrators who apply scientific principles and methods to whole categories of medical cases. In other words, the clinic has turned into a laboratory. By claiming predictable outcomes *without considering the human performance of the healing person and his integration in his own social group*, the modern physician has assumed the traditional posture of the quack."<sup>8</sup> (Author's italics)

But it must not be assumed that HM has necessarily escaped this ethos of professionalism. There is a proliferation of professional organisations among the various therapies some of which lay down strict conditions of entry such as long periods of training or the passing of examinations.<sup>9</sup> This is certainly the case in perhaps the three best known holistic therapies—osteopathy, acupuncture and homoeopathy—in which the situation is further complicated by the establishment of separate professional organisations in which training and membership are restricted to persons qualified in orthodox medicine. Such professionalisation is partly a device to gain recognition from orthodox medicine and the public as a whole; but it also serves to create divisions among the various therapies themselves. Such divisions, by making the acquisition of knowledge and skills within a particular therapy subject to certain conditions, detract from the possibility of cooperation between the therapies which is an essential pre-condition for the promotion of holistic health care. Moreover professionalisation does not necessarily bring enhanced recognition and prestige, compared with that given to established orthodoxy. This is well exemplified by Feyerabend's comment on the position of acupuncture in the USA:



Holistic medicine tries to incorporate the whole body.

"Acupuncture can now be practised in California by people who are not MDs. But while an MD can practise outside his speciality, the acupuncturist needs an additional licence as a dietician if he wants to prescribe a diet, a further licence if he recommends teas, a still further licence if he massages"<sup>10</sup>

Though disquieting, it is perhaps not surprising that HM should try to exploit existing social arrangements by attempting to gain recognition through professionalisation. However there must always be limits to such recognition because, unlike orthodox medicine, HM, as we have seen, is not grounded in scientific rationality. The full acceptance of HM must depend ultimately upon the broadening of the knowledge base of society so that science will take its place alongside other epistemological traditions and rank equally with them. This equal ranking of different traditions of thought would free individuals from the constraints placed on them by the institutionalisation of one form of knowledge; thus in the case of health care choices could be made between different medical therapies on the basis of what suits people best. This certainly would not rule out orthodox medical treatment because as Stanway argues:

**By claiming predictable outcomes without considering the human performance of the healing person and his integration in his own social group, the modern physician has assumed the traditional posture of the quack.<sup>8</sup>**

"Some diseases arise from purely physical causes such as fractures, or the blockage of a ureter by a kidney stone but these can be made good by orthodox medical skills. In fact this is what orthodox medicine is best at doing"<sup>11</sup>

On the other hand

"The vast majority of illness though comes into a much broader category . . . and this bulk of ailments is probably the result of all kinds of disruptions, be they environmental, dietary, psychological or 'other worldly'. Once we bear in mind that the physical body is just part of the much larger, if unmanifest, world that is directed by a superior power, we can better understand how it is that millions of people the world over have been practising forms of medicine entirely alien to us and our thinking quite successfully for thousands of years"<sup>12</sup>

Our inability to practise such medicine, let alone understand it, reflects the fragmentation of modern industrial culture to which I referred earlier. The institutionalisation of medicine has meant that health has become defined by professional fiat as an objective condition—something a person does or does not possess. But the holistic vision of health is life encompassing—it is a personal "task" the satisfactory performance of which depends on the degree of autonomy the individual enjoys in the culture to which he/she belongs.<sup>13</sup> For Illich:

"That society which can reduce professional intervention to the minimum will provide the best conditions for health. The greater the potential for autonomous adaptation to self, to others, and to the environment, the less management of adaptation will be needed or tolerated"<sup>14</sup>

However the promotion of this view of health cannot be achieved, other than on a very limited scale, in a society whose framework of values emphasises unlimited material growth, competition between individuals and nations and the exploitation of nature. That there is a growing interest in HM does indeed reflect a challenge to these values and a dissatisfaction with the way of life based on them; but there is no evidence that this is currently any more than the dissent of a minority from within the feminist, peace and ecology movements which has so far been given no real political expression. Ultimately, of course, the issue is political because only up to a certain point can individuals or small groups make inroads into the established order of things. In the last analysis the societal wide acceptance of alternative holistic medicine must imply an alternative society.<sup>15</sup>

#### References:

1. Science of course literally means 'knowledge' from the Latin verb *scire* 'to know'. But as Cameron and Edge have argued "scientific knowledge is taken to be the final word on, and is often called on to arbitrate over, 'what is really the case'. To 'be scientific' is to earn admiration: it is to claim (and often to gain) credibility and superiority over unscientific alternatives—while 'to be unscientific' is to be indefensibly woolly, vapid, old-fashioned, inefficient and generally unworthy of serious consideration". I. Cameron and D. Edge, *Scientific Images and their Social Uses*, Butterworths, 1979, p3.
2. F. Capra, *The Tao of Physics*, Fontana, 1976, p21.
3. This approach is known as 'logical positivism' and was developed by an influential group of philosophers, mathematicians and scientists in the Vienna Circle from the late 1920s.
4. See F. Capra, *The Turning Point*, Wildwood House, 1982, ch.2.
5. The notion of 'paradigm' was developed by T.S. Kuhn in his *The Structure of Scientific Revolutions*, The University of Chicago Press, 1962. It refers to a broad framework of thinking established in a particular area of knowledge (especially science) which receives more or less universal acceptance among those working within the discipline. In such circumstances alternative ideas opposed to the prevailing orthodoxy are very difficult to promote.
6. B. Inglis, *The Diseases of Civilization*, Granada, 1981, p154.
7. I. Kennedy, *The Unmasking of Medicine*, Granada, 1983, p85.
8. I. Illich, *Limits to Medicine*, Penguin, 1977 pp254-255.
9. For a list of professional bodies in holistic medicine see B. Inglis *Natural Medicine*, Fontana, Appendix, pp213-258. Also M. Hulke, ed., *The Encyclopaedia of Alternative Medicine and Self-Help*, Rider and Company, 1978, pp211-219.
10. P. Feyerabend, *Science in a Free Society*, NLB, 1978, p176.
11. A Stanway, *Alternative Medicine*, Penguin, 1982, p29.
12. *Ibid.*
13. I. Illich, *op. cit.*, p274.
14. *Ibid.*
15. Feyerabend in *op. cit.* p178, argues that in China hospitals and medical schools must use both traditional and western approaches to medicine. And he says that "similar means will have to be used by the democratic governments of the West, for there is no hope that 'the inner dialectics of Western medicine will lead to an equally enlightened attitude. There is too much at stake, both financially and as regards the 'reputation' of Western science. Governments, however, have the duty to provide the best surroundings for their citizens that can be achieved with human means". Whilst I agree with Feyerabend that the "inner dialectics" (contradictions) of orthodox medicine are not likely to bring forth more liberal attitudes to holistic medicine, I do not hold out any hope, as he apparently does, that the Government in a country like Britain is likely to foster alternative approaches to health care over the heads of the medical profession. In any case the major political parties very largely share existing medical ideologies—there has never been any evidence to the contrary. Unless there are radical changes in our political arrangements which would permit greater articulation and dissemination of the ideas upon which holistic medicine is based the prospects look bleak for its further development.



# The Search for Britain's Regions

by Bryan Waites

One of the greatest paradoxes in the world today is between internationalism and separatism. On the one hand we have the development of organisations like the United Nations, UNESCO, NATO, Warsaw Pact and the EEC, on the other hand there are Basques, Corsicans, Armenians, Tamils, Scots, Irish and Welsh seeking, often fighting for, separate states. Devolution, Separatism, Regionalism is part of an international agitation which has replaced outright war with subversive terrorism. Either overtly, as in Home Rule for Ireland, or secretly as in the English regions, devolution has been a long and historic theme. At the last election the SDP produced a Green Paper, *Decentralising Britain* closely followed by Labour's *Alternative Regional Strategy*, both canvassing well-worn ideas about elected regional assemblies. Why are we so strongly regional in this *United Kingdom* and how has it arisen?

The physical geography of the British Isles has always been conducive to the growth of regional populations with its many islands, peninsulas, mountains and valleys in both north and west, though within the lowlands of England the trend of the scarplands encouraged full and rapid occupation and assisted movement.

Sir Cyril Fox's classic definition of Highland and Lowland Britain separated by the Tees-Exe Line, though over-simplified, remains basically true. In the former, a zone of cultural continuity and resistance to change; in the latter of replacement and acceptance. Thus we have a broad national division into two physical and cultural areas from the dawn of history.

As wave after wave of invaders swept into Britain from the east, the lowlands received them and ab-

sorbed them, eventually to form the hybrid people and language we know today. But in the north and west change came slowly through the Megalithic builders and later Norsemen and Vikings who did not replace but rather enhanced the Celtic civilisation which had developed in its own special environment.

Despite the loss of their original vegetation cover, the 'Natural' regions within the Highland and Lowland zones remain physically distinctive. Cumbria and the Pennines retain a strong physical identity as do the Fens and the Weald. Holderness and the Hampshire Basin are clearly demarcated whilst the south-west peninsula has more connections with Celtic Wales than it has with England and, of course, historical affinity with Brittany too.

Such regions provided the heartland for subsequent development. Indeed, the 'natural' region had, superimposed upon its cultural features, many of which can still be traced in the landscape today. For example, in patterns of land holding often derived from specialised inheritance laws, such as the subdivisions of the Weal-

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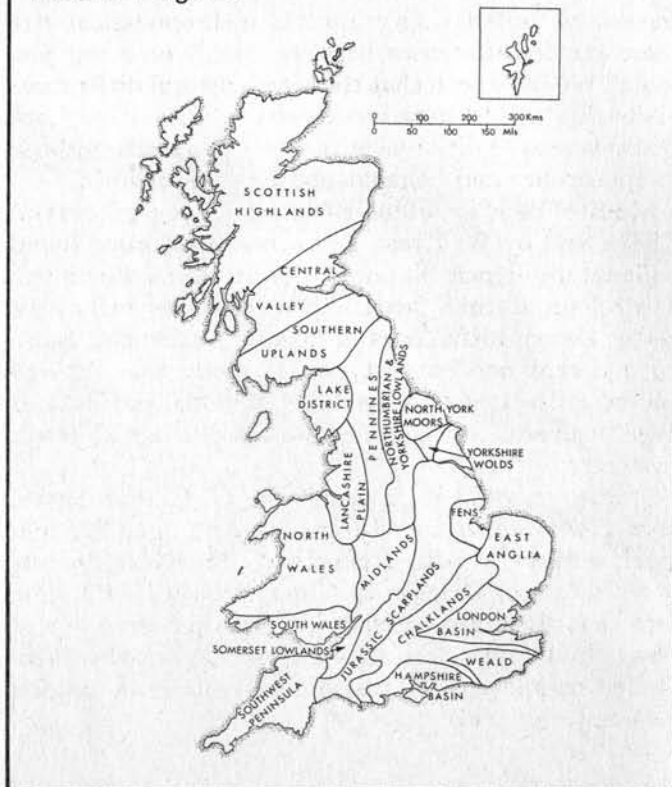
den area under Jutish occupation in the sixth century. From this kind of influence derived differences in farming patterns and practices which characterise our regions today. It is likely that the specialisation towards sheep farming in the chalklands originated about this time. Some say that the common field system, brought over from the Continent, was also adapted regionally so that there was a predominant Midland system but also an East Anglian and Kentish system. Outside all these was the unique Celtic system based on the run-rig. Further research is likely to show more detailed adaptations to sub-regions by the early settlers.

Use of local building materials also contributed to distinctive architectural styles which now characterised the natural regions. For example, the limited use of Charnwood Forest granites and slates in Leicestershire; the timber cruck and box frame buildings of Cheshire reflecting a clay and forested area; the familiar Cotswold stones of the limestone scarplands and the very different styles of construction in the carboniferous limestones of the Pennines. As we travel around Britain today it is these cultural differences, observable in the landscape and buildings of the regions that give the character we remember. Despite Britain's smallness it has more regional variety than almost any other comparable country. Brunskill, Clifton-Taylor and others have shown how vernacular building has developed on a regional basis which can be easily identified, even one thousand years later and which reflects the social structure of the societies establishing it.

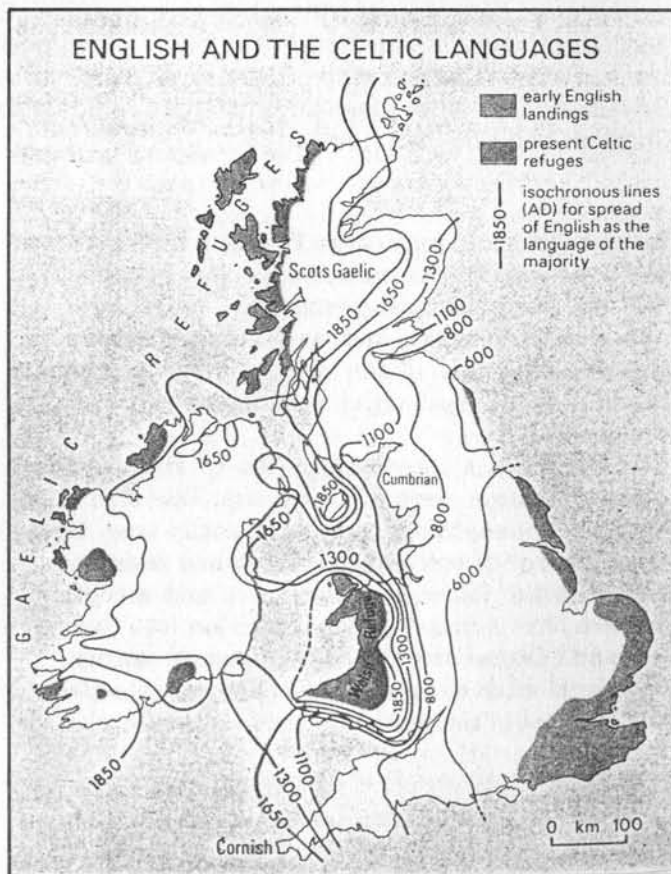
In a similar way, the study of dialect shows distinctive regionalisation. This has been revealed by the great *Atlas of Dialect* produced by University of Leeds where the area distribution of local forms of usage and pronunciation basically indicate a broad division of England into Northern, West Midland, East Midland, South-Western and South-Eastern regions. But within such regions there are even more detailed sub-regions with their own peculiarities. There is the 'rounded vowel' area of Devon; the long and short 'a' between north and south corresponding to the old Danelaw boundary; the restricted use of Scandinavian words like 'laik' (play) between the Humber and the Tyne, including Cumbria. Forms of 'I am' have been plotted showing use of 'am' in the north east and across the Midlands to include East Anglia and the South East, but 'be' occurs widely south west of a line from Cheshire to Sussex and 'bin' occurs in a small area along the Welsh borderland whilst from Cumbria across to East Yorkshire 'is' can be found.

Continued research and plotting of dialect distributions will indicate the strength of regionalism and, even, the precise boundaries. Associated work on placenames will contribute to this. Work by Professor Cameron and others is showing placename groupings throughout the country which reveal the pattern of Celtic retreat, Anglo-Saxon colonisation and Scandinavian occupation. New ideas about placename endings such as the antiquity of the 'ing' and 'ham' endings is giving a revised notion of previously conceived distributions. Also, the interesting topographical inter-

## 'Natural' Regions



pretation of Mrs Gelling is bringing new light on the basic principles of choice in early settlement which, in turn, can show the progress and regionalisation of settlement. For example, placenames clearly indicate a grouping of Scandinavian settlement to coastal and Wold Valley sites in East Yorkshire whilst the earlier Saxon settlers were located in the more fertile scarp-foot and dip-slope areas of the Wold margins.



But one of the most interesting lines of enquiry into the search for Britain's regions is anthropological. Are there ethnic differences between people on a regional basis? We have seen that there are cultural differences visible in the landscape based on core 'natural' regions. Did this lead to differences not only in speech but also in appearance and behaviour? Has this survived?

Studies such as John Beddow's *Races of Britain* (1885), and by W. Kruse and others in Europe found regional differences in population in terms of eye and hair colour, stature, face and head shape as well as the better known differences in dialect, settlement, farming patterns and house types. It seems that, like an animal in its specialised habitat, regional populations lived in an area to which they were well adapted—their ecosystem.

Studies in medical geography by G. Melvyn Howe, *Man, Environment and Disease in Britain* (1972), and much earlier by Alfred Haviland, *The Geographical Distribution of Disease in Great Britain* (1892), confirm that there are certainly regional patterns of disease not only related to the environment but also to inherited characteristics transmitted within one region for many centuries.

### Physical Differences

Such differences can be seen in the *National Atlas of Disease Mortality* (1963) produced by Dr. Howe. Associated with this is the distribution of blood groups. Work done by Kopec and Brown produced distribution maps of the country clearly showing concentrations of specific blood groups to certain regions. Very different populations, in terms of the ABO blood group system, occur to north and south of a line running from the Tees to the Exe rivers. There are some odd anomalies which need explaining: why is there a concentration of group A in Norfolk? Why are there high frequencies of group B in the Welsh mountains? Blood groups are associated with other physical characteristics. For instance, group A people are often slightly taller, more round headed than average, usually with blue eyes and fair skin. Shorter, longer-headed and darker-skinned people are usually of group O. Different blood groups respond in different ways to disease. The survival of such characteristics may go back into prehistory.

Since Beddow also mapped hair and eye colour over Britain it is possible to compare his findings with the data on blood groups to discover regions. In all these a clear division between highland and lowland, between Celtic and English emerges first. Then, with more care and detailed examination it is possible to see, within England, that the basic divisions are the South-West, the Midlands, East Anglia and the South-East, Northern England. Closer examination of such data will help to explain the greater incidence of colour blindness in Devon and Cornwall or why in the Welsh hills and the Orkneys the natives cannot taste phenylthiocarbamide when the rest of us can.

Physical variations in Britain are all the more remarkable when we consider not only its smallness but also recent population mobility and invasions or immigrations. However, physical differentiation is not due to chance and, with proper research, will indicate

more about our regional populations. Whilst this study is vital before all traces may vanish it is fraught with problems. Who, today, will be brave enough to stand up and say he is studying racial differences in Britain on a regional basis? Yet it is in this direction that the greatest discoveries are most likely to be found in the future.

Whilst Celtic areas retained cultural and territorial integrity, in the English lowlands for several centuries Saxon then Scandinavian settlers jostled each other to establish their regions and so formulated the English counties. These historic cultural areas sometimes had their heartlands in 'natural' regions but also extended beyond. They created the county system and loyalties 1500 years ago which have been the backbone of subsequent attempts to divide the country into regions. As the Local Government Reforms of 1974 showed, when the State interferes with such historic regions, there is trouble.

Research is showing that even in Neolithic times small estates, territories or regions were emerging (eg. Spratt—in the North York Moors). Before the Romans arrived there were tribal areas such as the Iceni in Norfolk, the Coritani in Lincolnshire, the Parisi in East Yorkshire, the Dumnonii in Devon and Cornwall. Exactly where their boundaries might have been is still a mystery.

The onset of the Romans led, eventually, to a division of the country (mainly England and Wales) into administrative areas with civitas capitals, municipium or colonia—perhaps the first regional centres and now the basis of our present-day centres. Areas of local self-government were based on previous tribal areas so that, wisely, the Romans left the country arranged as it had been but more formally.

This arrangement or regionalisation persisted but in the 4th century provinces were established forming a national set of regions. Britannia Prima consisted of Wales and the South-West; Maxima Caesariensis was the South and South-East; Flavia Caesariensis the Midlands and East Anglia whilst Britannia Secunda was Northern England north of the Humber-Mersey line.

To some extent this regionalisation remained into Saxon times but as the map of AD634 shows, tribes entering from different directions soon secured their own areas which later acquired characteristic names. For example, the small area of the South-East was divided into several areas around the great forest of Andredsweald. The Midlands were sub-divided into Middle Engles, West Engles, Hecana, Hwiccas and Mercians. Closer examination of regions would show that settlement was well adapted to the landscape and environment.

The succeeding centuries indicated struggles, invasions and compromise as the English regions became formalised. By the 9th century there were nine major divisions: Bernicia, Cumbria and York in the north; Mercia and the Five Boroughs in the Midlands; East Anglia and Kent in the East; Wessex in the south; the West Welsh in Cornwall and Devon. Wales proper was being left alone by this stage.

So we see the evolution from the core 'natural' region



providing an environment where settlers could flourish and retain their identity. Cultural features developed to make the area even more characteristic. Racial identity was reinforced within the area. Subsequent invasions did not destroy the formula which had been created but emphasised it since new colonists were absorbed by the old. The embryonic region swallowed all and made them its own. Language and dialect encouraged it. Local patriotism grew. As Robert Ardrey has shown, humans like animals, abide by the 'territorial imperative'. Not only is the Englishman's home his castle but his district is his bastion too except that the cosmopolitan and industrial society may have threatened this concept.

Yet has it? As long ago as 1915 Patrick Geddes discovered the growth of the *city region*: 'Constellations we cannot call them; conglomeration is, alas, nearer the mark but it may sound inappropriate, what of 'Conurbations'? After distinguishing seven, he went on to note that they constituted a 'new Heptarchy which has been growing up naturally, yet almost unconsciously to politicians, beneath our existing, our traditional political and administrative network'. The rise of a cosmopolitan industrialised society in Victorian times did not destroy the region but created, almost secretly, new regions like the Potteries with their own well-formed characteristics. In some ways, the 'doomed' Metropolitan counties carried on this legacy.

Recently discovered resources and older resources re-discovered can create problems. Who really should own Scottish oil? Welsh water? Cornish tin? Nationalism/Regionalism suddenly associated with rich, vital resources can mean new found security and self-contained independence—at least the mirage might appear real for a time. Then, the cultural identity which tourists may only see in road signs, rural life museums, Highland Games, Eisteddfod, Orange Day Parades and the Tynwald Ceremony will have substance.

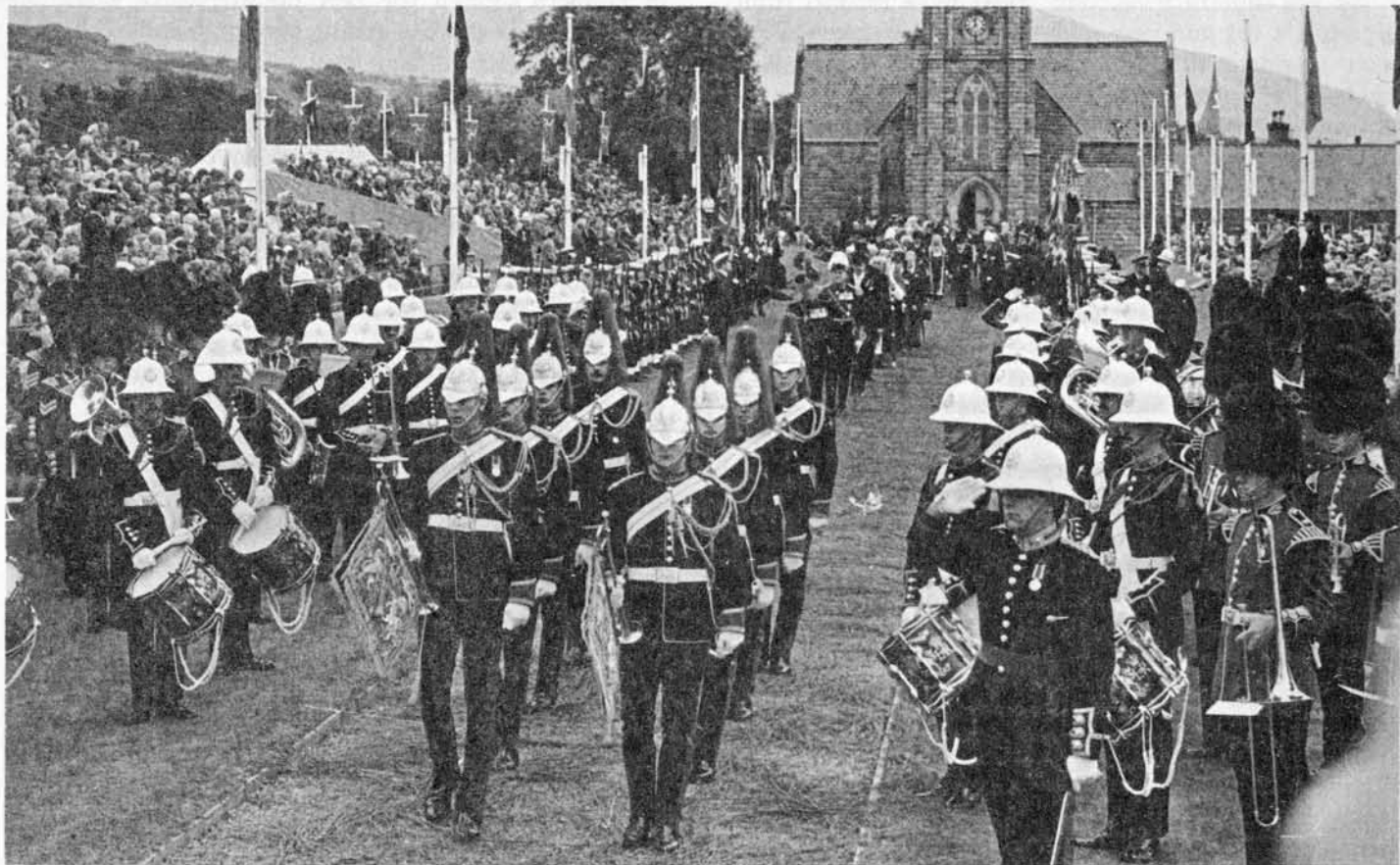
In a time of depression and stress the Territorial Imperative becomes supreme and the region regains its importance.

Yet some may say that all is lost, already we are all alike in Britain. Indeed, there are political as well as economic forces trying to make us all alike under the banner of equality. However, as D. Elliston Allen has shown in *British Tastes* 'each region of Britain has a detectable set of interwoven attitudes, a distinctive trend in its underlying psychology, which is long-enduring and which imparts a certain special look or direction to virtually every kind of human activity carried on by its inhabitants . . . Each region in its present-day behaviour is to a great extent the product of its past'. Market research continues to prove this and the *Regional Trends* analysis produced by the Central Statistical Office as well as the latest census returns confirm it.

Who would have guessed that the Welsh eat more potatoes, sugar and jam than anyone else in Britain? That the Scots eat more bread, biscuits and cakes? That Yorkshiremen eat more fish and eggs but less fruit, milk and cheese? 'Love blooms in the Fens of East Anglia and blossoms in the factories and mills of Yorkshire but it fades and wilts as you cross the border into Scotland', says a survey on British romance. As for car ownership, house ownership, health provision, educational facilities, etc. the regional variations are enormous. Plotting of electoral statistics also shows a divided Britain, regionally. Even if we are not so close to the 'natural' region today it is clear that we have created *behavioural* regions which are just as definable.

Perhaps we are now in need of new prophets of regionalism? It seems a long time since Sir Patrick Geddes in his *Making of the Future* and C.B. Fawcett in his *Provinces of England* (1919) advocated devolution and demarcated regions. Since the Speaker's Conference on Devolution in 1919 and Fabian suggestions, followed by the geographical interest of E.G.R. Taylor, R.E. Dickinson and E.W. Gilbert, then by economists like G.D.H. Cole, Ashby and Robson. All this was in the aftermath of the first world war and the inter-war depression. Again, a time not unlike our own when internationalism vied with nationalism shrouded in a poverty-stricken world where people found the only solace was a retreat into their well-known regions. Even now, can we say that regionalism is popular or just the debating ploy of politicians and academics?

The second world war encouraged some devolution and by 1951 there was a Ministry of Welsh Affairs, by 1964 a Secretary of State for Wales. More recently the Referenda rejected proposals for separate assemblies



Tyn Wald Ceremony: Isle of Man

in Scotland and Wales. Northern Ireland gained substantial devolution of power in 1920 until the prorogation of Stormont in 1972. Now some think a new era may be beginning in that much troubled area.

As Lewis Mumford remarked 'people are attached to places as they are to families and friends. When these loyalties come together, one has the most tenacious cement possible for human society' and he went on to comment on the value of the region as 'a source of essential values in a balanced life'.

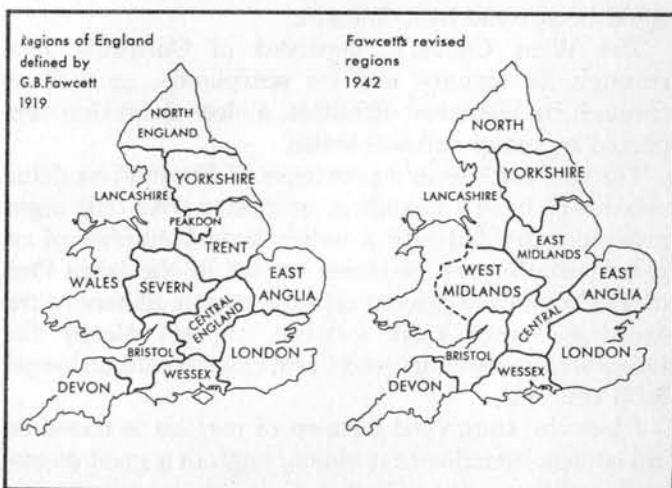
People are concerned about size and scale. They look for small scale regions which are comprehensible. This has been well expressed by Professor Leopold Kohr in the 52nd Conway Memorial Lecture of 1970: 'The true contemporary conflict is between man and mass, between the citizen and the state, between the small society and the big one, between David and Goliath . . .' He warns that 'the monster of Bigness smothers all'. Regions should be small enough for their natives to understand and they should have an infinite capacity to convert newcomers, be self-perpetuating and self-contained in spirit. They also want to be amongst people like themselves and that is why cultural and historic links are important, even more so why behavioural and perceptual attitudes are relevant.

Speedy solutions are needed because if regional consciousness in England achieves the same degree of intensity and national identity as that of Wales, Scotland and Ireland then Britain will disintegrate and collapse into its Anglo-Saxon kingdoms. The incompetence of central government would precipitate this and, indeed, it could happen more by the increasing difficulties of governing than by sheer incompetence.

*The Ecologist*, Vol. 14, No. 4, 1984

Oddly enough, history shows that great empires eventually lose not only their possessions but also their own internal unity. Regionalism is a force and a problem all over the world. It cannot be ignored. But the soul of a country is in its regions and, therefore, its salvation is there too. Consequently, regions must be studied and understood and that means the people in them as well. Regionalism in all countries is the source of strength and latent power which can and should resurrect the Nation.

The natural, cultural, racial and historic region exists in Britain despite changes in the last two thousand years. We know when we are in it but its boundaries are not always easy to define since they are zones rather than lines. Like picking your best World Test Team, scholars and others have spent many hours trying to find their 'eleven best' regions.



As the illustrations show these have ranged from Fawcett's old and new regions to City Regions, Federal Regions, the new counties of 1974, standard regions, assisted areas and the like. What emerges overall is that Celtic Britain, including Cornwall, should be considered apart from England.

Within England itself all evidence combines to indicate clearly, a division into its *real* provinces and regions. The map below attempts to identify these and to give them traditionally accepted historic/geographic names. There are eight provinces each with historical or geographical integrity and to a large extent, popular recognition. Each province has a capital: Pennines—Leeds; Danelaw—Nottingham; Mercia—Birmingham; East Anglia—Norwich; Weald—Canterbury; Wessex—Southampton; West Country—Bristol; and London.

Choice of provincial capital would no doubt provoke controversy since it is based more on functional role today rather than on historical 'right'. Personal loyalties would choose alternatives such as York, Lincoln, Chester, Bury St. Edmunds, Cambridge, Chichester and Winchester. However, these places are not ignored since they often remain regional capitals.

The provinces are divided into real regions which have historical validity and a meaning to the people. The Yorkshire Ridings are revived but named differently. Ancient Northumbria is restored, also Lancastria, but the 'modern' Cumbria is retained since it preserves the unity of the Lake District.

In Danelaw, Lindsey returns and the unity of the Trent Valley with its mountain catchment is recognised. The relationship between the 'shires' of Leicester, Northampton, Rutland, Peterborough and Huntingdon is restored.

Mercia itself approximates to the core of the ancient Saxon kingdom with its Welsh borderland, its now largely industrialised Arden and Chester's hinterland forming the regions.

East Anglian regions are based on Norfolk and Essex with Suffolk and Cambridgeshire unified. There has been a similar fusion of counties in the Weald which reflects the geographical structure and the early history of settlement in the area.

Wessex, with its core in the chalklands and its characteristic coastline, reaches towards and includes Bedfordshire, Hertfordshire, Buckinghamshire and Oxfordshire. Some might identify and separate a Chilterns Province here which for well-qualified reasons could be severed from Wessex.

The West Country, deprived of Cornwall, has, through its estuary and its scarplands, as well as through its historical affinities, a clear definition supported by many cultural traits.

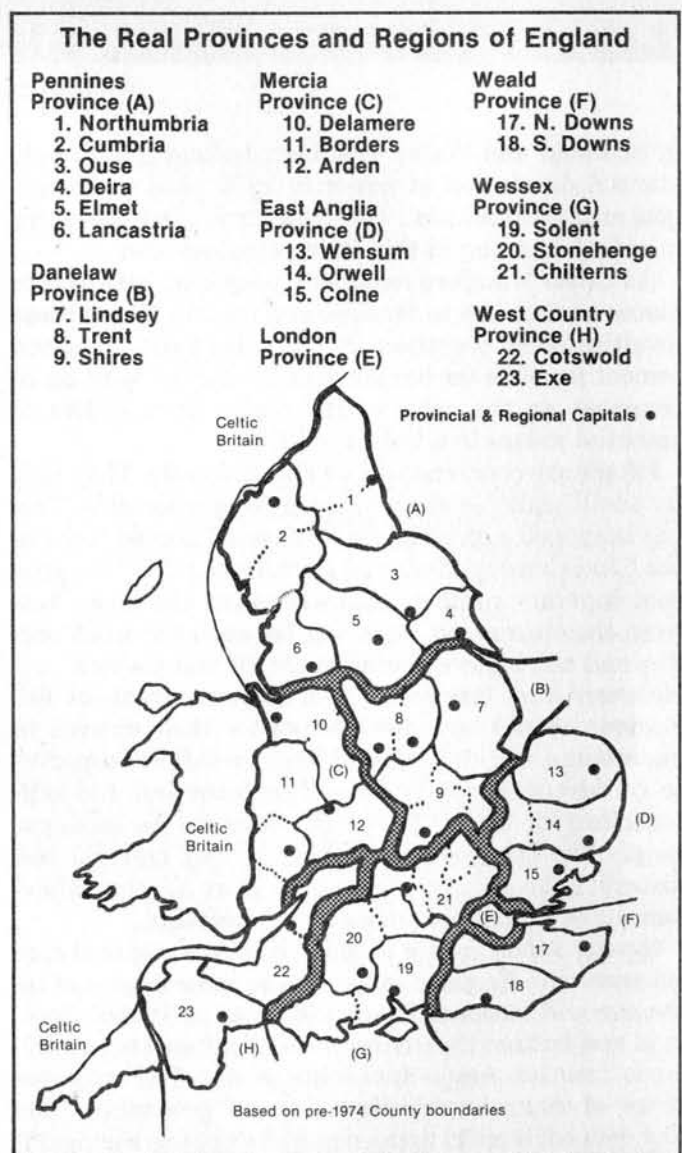
The real regions and provinces of England as delineated here have a beguiling simplicity with only eight provinces divided into a well-balanced number of regions, usually two or three, except in the large Pennines Province. Regional capitals mostly adhere to the existing county town pattern, though places like Leicester, Shrewsbury and Cambridge would no longer fulfil this role.

Since the suggested pattern of regions is based on old county boundaries it should sustain a good degree

of support though the new nomenclature would be challenged, despite its strong geographical and historical basis.

The search for England's real regions must continue and, before it is lost forever, the relevant evidence from all quarters must be assembled. Eventually, by this means a more accurate and honest evaluation of our regions will be made. This is not a nebulous quest for the Holy Grail; it will not emerge fortuitously from the water like Excalibur nor will it disappear like a dream into the mists of Avalon. Because the search for England's regions seems an ideal, a goal never to be secured we might think that we strive in vain, that the real regions are always one step beyond.

Such thoughts must instantly be banished from our minds. The real English region does exist and we shall find it. Modern techniques will assist in this great endeavour. Equally important, however, and perhaps more elusive, is the recognition that our country must give more scope for regional consciousness not only in its everyday life but also in its political administration. We must encourage the regions more, not depress them further; we must find our strength from them, not look on them as a weakness; we must use them to renew our national consciousness for the soul of England is in its regions.



# Bioregionalism—A New Way To Treat the Land

by Kirkpatrick Sale

A bioregion is naturally defined by its location, geology, soil structure, wildlife and the human communities as well as their cultures that arise within its confines. Kirkpatrick Sale argues that bioregions should be allowed to develop in relative autonomy from the outside, their human inhabitants learning, as they once did, to live within its constraints and coming again to respect their environment and its sustainability.

*To Gaea, mother of all of life and oldest of gods, I sing,  
You who make and feed and guide all creatures of the  
earth,  
Those who move on your firm and radiant land, those  
who wing  
Your skies, those who swim your seas, to all these you  
have given birth;  
Mistress, from you come all our harvests, our children,  
our night and day,  
Yours the power to give us life, yours to take away.  
To you, who contain everything,  
To Gaea, mother of all, I sing.*

Homeric Hymn to Earth

In the beginning, as the Greeks saw it when chaos settled into form, there was a sphere, aloft, floating free beneath the moist, gleaming embrace of the sky and its swirling drifts of white cloud, a great vibrant being of green and blue and brown and grey, binding together in a holy, deep-breasted synchrony the temperatures of the sun, the gases of the air, the chemicals of the sea, the minerals of the soil, and bearing the organised, self-contained and almost purposeful aspect of a single organism, even a living, breathing body, a heart, a spirit, a soul, a goddess, in the awed words of Plato, "a living creature, one and visible, containing within itself all living creatures."

To this the Greeks gave a name: Gaea, the earth mother. She was the mother of the heavens, Uranus, and of time, Cronus; she was the mother of the Titans and the Cyclops, of the Meliae, the ash-tree spirits who were the progenitors of all humankind; she was the mother of all, first of the cosmos, creator of the creators. She became the symbol of all that was sacred and the font of all wisdom, and at the fissures and rifts in her surface—at Delphi, especially and Dodona and Piraeus—she would impart her knowledge to those oracles who knew how to hear it. And ultimately, inevitably, she became embodied in the language of the

Greeks as the unit of life, of birth, or origination, combined into the word *genos* to give us, in English, *genesis, genus, genitals, genetics, and generation*.\*

"Earth is a goddess," wrote Xenophon in the fourth century before Christ, "and teaches justice to those who can learn." Justice, and compassion, and prudence, and appropriateness, and harmony, all of what were later the cardinal virtues: "The better she is served," Xenophon taught, "the more good things she gives in return."

All that seems obvious enough, or at least was obvious enough to those who first inhabited the earth and created her cultures—which is why, in virtually every early society that we know of, in every preliterate society that has been discovered, the primary deity, worshipped before all others, was the earth. And even in those societies that eventually came to displace the earth goddess with other gods, most typically the sky god—a male figure, be it noted, and one adopted almost exclusively by those cultures (even

\*It is from Gaea, of course, that we also get our word for geography, a subject now almost as lost in the schools as the respect for the object it names, as well as *geometry* (the study of lines of the earth), *geomancy* (divination by lines of the earth), *geology*, *geodesy*, and the like.

the later Greeks) which simultaneously created empire, war, hierarchy, priesthood, and slavery—even in those societies the earth was still considered a living being, sentient and organic and still retained its character as a deity.

It was not until the development of European science, from about the sixteenth century on, that this animistic conception of the earth finally gave way, to be replaced by one supported by the new insights of physics, chemistry, mechanics, astronomy, and mathematics. The new perception held—more than that, in fact it *proved*—that the earth, the universe, and all within it operated by certain clear and calculable laws and not by the whims of any living, thinking being; that, far from being divine and omnipotent, these were capable of scientific prediction and manipulation; and that objects, from the smallest stone to the earth itself and the planets beyond, were not animate with souls and wills and purposes, but were nothing more than the combination of certain chemical and mechanical properties. The cosmos was in no sense like a purposeful, pulsatory celestial thing alive but rather, in the Newtonian image, something more like a giant clock, its many parts moving in an ordered, kinetic, mechanical way. Europe's scientific revolution—in the triumphant words of the seventeenth century physicist Robert Hooke—enabled humankind “to discover all the secret workings of Nature, almost in the same manner as we do those that are the productions of /human/Art and are manag'd by Wheels, and Engines, and Springs.”

The history of ideas is just like the history of technologies: those that suit the powers-that-be are embraced, those that seem to not have utility are forgotten.\* The ideas of the new science were very quickly heeded, and their creators rewarded and pantheonized by a European establishment which at the same time was in the process of creating other complementary attitudes and systems for which scientism provided both intellectual conditioning and practical guidance. Thus the scientific system was developed, contemporary with, and by no means accidentally, in aid of the consolidation of the nation state, the growth of mercantile and then corporate capitalism, and the spread of global exploitation and colonialism. Its inherent message—the celebration of the quantifiable, the mechanistic, the physiochemical, the tangible, as against the organic, the spiritual, the creative, and the intangible—had immense importance. Its ultimate governing principle, that humans should not merely understand but be capable of manipulating Nature, and in Descartes' words be “masters and possessors of Nature”—became ingrained not merely into the scientific but all scholarly and most popular thinking in the Western world, so that today it shapes our perceptions and our psyches.

The scientific world view is not without its values, its uses, its triumphs even, and I think we may want to call the world a better place for our knowledge of hygiene, say, or radiotelegraphy, or immunology, or electricity. But its shortcomings, its failures, its calamitous dangers have by now become obvious, and it is surely safe to say that the path of sanity, perhaps survival, is to regain the spirit of the ancient Greeks, once again to comprehend the earth as a living creature. We need to recover the sense, as Schumacher puts it in *Good Work*, “That man is the servant of this

world, or at least a trustee,” a concept that has been “organised out of our thinking,” as he put it, “by the modern world,” and must listen again to the two great teachers, one “the marvellous system of living nature” and the other “the traditional wisdom of mankind,” teachers we have “rejected and replaced by some extraordinary structure we call objective science.”

In *The Interpreters*, a book by the Irish author known as AE, written at the height of the Irish Revolution, there is a passage in which a group of disparate men, all prisoners, sit around discussing what the ideal new world should look like. One of them, the poet Lavelle, argues fervently against the vision put forth by one prisoner, a philosopher, of a global, scientific, cosmopolitan culture. “If all wisdom was acquired without,” he says, “it might be politic to make our culture cosmopolitan. But I believe our best wisdom does not come from without, but arises in the soul and is an emanation of the earth-spirit, a voice speaking directly to us as dwellers in the land.”

But to become “dwellers in the land,” to regain the spirit of the Greeks, fully and honestly to come to know the earth, the crucial and perhaps only and all-encompassing task is to understand the place, the immediate, specific place, where we live: “In the question of how we treat the land,” as Schumacher says, “our entire way of life is involved.” We must somehow live as close to it as possible, be in touch with its particular soils, its waters, its winds, we must learn its ways, its capacities, its limits, we must make its rhythms our patterns, its laws our guide, its fruits our bounty. That, in essence, is bioregionalism.

All aspects of the bioregional society—and, one might imagine, a bioregional world—take their forms from that of Gaea herself. One of Gaea's many offspring, the first of all her daughters, was Themis, the goddess of the laws of nature and the mother of the seasons, and it is by a diligent study of her—her laws, her messages, her patterns as they have been established over these many uncounted millenia—that we can guide ourselves in constructing human settlements and systems. A bioregion is a part of the earth's surface whose rough boundaries are determined by natural rather than human dictates, distinguishable from other areas by attributes of flora, fauna, water, climate, soils, and land-forms, and the human settlements and cultures those attributes have given rise to. The borders between such areas are usually not rigid—Nature works with more flexibility and fluidity than that—but the general contours of the regions themselves are not hard to identify, and indeed will probably be felt, understood, sensed, or in some way known to many of the inhabitants, and particularly those rooted in the land, farmers, ranchers, hunters and fishers, foresters and botanists, and most especially, across the face of America, tribal Indians, those still in touch with a culture that for centuries knew the earth as sacred and its well-being as imperative.

The widest region, taking its character from the broadest measures of native vegetation and soil contours, may be called the *ecoregion* and will generally cover several hundred thousands of square miles over several states; it is possible to determine

\*I think, in this context of Her of Alexandria, who created a steam engine of sorts in the third century B.C. But the Mediterranean powers of the time had no need for such a device, having an abundance of slaves, and so it was not until the eighteenth century, in an England where slavery was outlawed and cheap labour unreliable, that the steam engine was re-invented and perfected.

somewhere between forty and fifty such areas across North America. But within these ecoregions it is easy to distinguish other coherent territories that define themselves primarily by their surface features—a watershed, or river basin, a valley, a desert, a plateau, a mountain range—and which we may all call the *georegion*. And within these georegions, in turn, one can often locate still smaller areas, of perhaps several thousand square miles discrete and identifiable with their own topographies and inhabitants, their own variations of human culture and agriculture, to which we may give the name *vitaregion*.

Using that terminology for our location today, we would say that we are in an *ecoregion* that could be thought of as the Northeastern Hardwood, stretching (in conventional terms) from mid-New Hampshire and Vermont to mid-New Jersey, an area characterised by birch and beech in addition to conifers, largely podzol and blue podzolic soils, and a July-maximum, January-minimum rainfall. Within this territory are a number of obvious *georegions*—the Hudson watershed, the Berkshires, the Massachusetts Bay systems—and South Hadley is solidly with the Connecticut River georegion, a long fertile valley running between the Green and Taconic Mountains on the west and the White Mountains on the east all the way down to the Long Island Sound. But there are obvious distinctions to be made within this georegion, too, for the valley here as it broadens out from the Deerfield River on down to the Meshomasic foothills south of Hartford, is quite different from the stretch up north to the Ammonoosuc or south in the pinched and hilly course to the Sound; and within this *vitaregion* clear differences from surrounding areas in both agriculture—tobacco, for example, and potatoes—and homoculture can be seen.

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Nevertheless at this stage of bioregional consciousness it is more important to stand a bit aside and appreciate the broad contours of the concepts than to plunge headlong into the briarbrush of elaborate differences and definitions. Whether we speak of ecoregion or georegion or vitaregion, after all, we speak of bioregions, and it is that essential archetype that is most important to comprehend. For once that is done on any significant scale then the matter of making distinctions and creating human institutions to match them can be safely left to the inhabitants, the dwellers on the land, who will always know them best. In the discussions to follow, therefore, we may imagine that bioregionalism will apply in its initial and formative phases to the largest territory, the ecoregion, and thereafter, in an evolving organic process, narrowing in scale as the perceptions become sharper and the tools more finely honed, to smaller and smaller territories, to the vitaregion and perhaps beyond, moving closer and closer to the specifics of the soil and those who live upon it.

## Economy

The economy that comes into being within a bioregion also derives its character from the conditions, the laws, of Nature. Our ignorance is immense, but what we can be said to know with some surety after these many centuries of living on the soil has been cogently summarised by Edward Goldsmith, the editor of *The Ecologist*, as the laws of *Eco-dynamics*—to be distinguished, from the laws of *Thermodynamics*.

The first law is that conservation, preservation, sustenance, is the central goal of the natural world, hence its fundamental resistance to large-scale structural change; the second law is that, far from being entropic Nature is inherently stable, working in all times and places toward what ecology calls a *climax*, that is, a balanced, harmonious, integrative state of maturity which, once reached, is maintained for prolonged periods. From this it follows that a bioregional economy would seek to maintain rather than exploit the natural world, accommodate to the environment rather than resist it; it would attempt to create conditions for a climax, a balance, for what some economists have recently taken to calling a “steady state,” rather than for perpetual change and continual growth, in service to “progress,” a false and delusory goddess if ever there was one. It would, in practical terms, minimise resource use, emphasise conservation and recycling, avoid pollution and waste. It would adopt its systems to the given bioregional resources—energy based on wind, for example, where Nature called for that, or wood where that was appropriate, and food based on what the region itself—particularly in its native, pre-agricultural state—could grow.

And thus it would be based, above all, on the most elemental and most elegant principle of the natural world, that of self-sufficiency. Just as Nature does not depend on trade, does not create elaborate networks of continental dependency, so the bioregion would find all its needed resources—for energy, food, shelter, clothing, craft, manufacture, luxury—within its own environment. And far from it being deprived, far from it being thus impoverished, it would gain in every measure of economic health. It would be more stable, free from boom-and-bust cycles and distant political crises; it would be able to plan, to allocate its resources, to develop what it wants to develop at the safest pace, in the most ecological manner. It would not be at the mercy of distant and uncontrollable national bureaucracies and transnational governments, and thus more self-regarding, more cohesive, developing a sense of place, of community of comradeship, and the pride that comes from stability, control, competence, and independence.

In one of his more prescient perceptions Fritz Schumacher realised that the market economy of twentieth century capitalism erred fundamentally, because it erred repeatedly, against Nature. “It is inherent in the methodology of economics to ignore man’s dependence on the natural world,” he wrote. “The market represents only the surface of society and its significance relates to the momentary situation as it exists there and then. There is no probing into the depths of things, into the natural or social facts that lie behind them.” And this is why, as he points out, conventional economics makes no distinctions at all between primary goods, “which man has to win from nature,” and secondary goods manufactured from

them, or between renewable and nonrenewable resources, or the environmental and social costs of developing one against the other.

A bioregional economy, in sharpest contrast, makes—in fact is grounded in—these vital distinctions.

### Politics

Political principles on a bioregional scale are also grounded in the dictates presented by Nature, in which what is forever valued are not the imperatives of gigantism, centralisation, hierarchy, and monolithicity, but rather, in starkest contraposition, those of scale, decentralisation, division, and diversity.

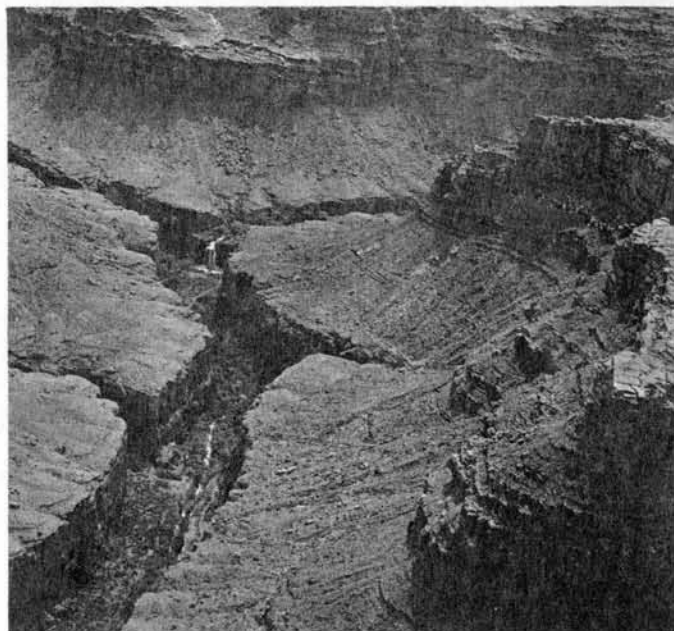
The lessons are obvious, and suggest immediately the design for a bio-region as for a continent of bioregions. Each unit, of the size that the natural settings promote, may be unified and cohesive—starting from the base up with a neighbourhood, a community, a small town, all living side-by-side with others in a settled and mutual pattern, together comprising a vitaregion; and that vitaregion may have its own unification and cohesiveness, its own method of governance, and yet live side-by-side with other regions, organised as they may see fit; and so on, outward, in selfsufficient collaboration, unit upon unit, for so long as the natural boundaries may permit and the natural affinities be kept intact.

Similar lessons may be derived from the patterns of human nature. Thus throughout all human history people have tended to live in separate and independent groups, a “fragmentation of human society” that Harold Isaacs, the veteran MIT professor of international affairs, has described as something akin to “a pervasive force in human affairs and always has been.” Even when nations and empires have arisen, he notes, they have no staying power against the innate human drive to fragmentation: “The record shows that there could be all kinds of lags, that declines could take a long time and falls run long overdue, but that these conditions could never be indefinitely maintained. Under external or internal pressures, usually both, authority was eroded, legitimacy challenged, and in wars, collapse, and revolution, the system of power redrawn.”

The implications are that truly autonomous bioregions will likely go their own separate ways and end up with quite disparate political systems—some democracies, no doubt, some direct, some representative, some federal, but undoubtedly all kinds of aristocracies, oligarchies, theocracies, principalities, margravates, duchies, and palatinates as well.

### Society

Once recently when asked to name the seven wonders of the world, the renowned biologist Lewis Thomas led off with the extraordinary phenomenon of the *oncideres* beetle and the mimosa tree. It seems that when she wishes to lay her eggs the female *oncideres* beetle unfailingly picks out the mimosa tree from all others in the forest, crawls out on one of its limbs and cuts a long lengthwise slit into which she drops her sacs. Then, because in the larva stage the offspring cannot survive in live wood, she backs down the branch a foot or so and cuts a neat circular slit through the bark all around the limb, which has the effect of killing the branch within a very short time, where-upon it falls to the ground in the next strong wind and becomes the home for the next generation of *oncideres*



A natural bioregion—Havascu Canyon, Arizona, the home of the Havasupai Indians. Until recently, they were able to regulate their numbers so that they remained at peace with their cliff-girt home without spreading into the surrounding desert.

beetles. But, interestingly, this process also has the effect of *pruning* the mimosa tree, a rather valuable ancillary result because, left alone, a mimosa has a lifespan of twenty-five to thirty years, but pruned in just this simple way it can flourish for a century or more.

Now Dr. Thomas seems to regard this relationship as sufficiently extraordinary to be regarded as a wonder of the world, particularly worthy, he says because such things “keep reminding us of how little we know about nature.” Well perhaps confession on the side of ignorance is wise in these matters, and yet I do think it is permissible to point out that, first, far from being unusual, this sort of biological interaction is in fact commonplace throughout every phase of Nature, and, moreover, it is found with such regularity that it should indicate at least one lesson we know very well. The relationship is symbiosis, and its persistence and pervasiveness in the natural world suggests a fundamental principle.

Indeed the prime example of such an interaction on the bioregional scale should be social symbiosis between the city and the countryside, the urban and the rural, a correlation which has been celebrated by philosophers from Aristotle on. Fritz Schumacher says “Human life, to be fully human, needs the city; but it also needs food and other raw materials gained from the country. Everybody needs ready access to both countryside and city. It follows that the aim must be a *pattern* of urbanisation so that every rural area has a nearby city, near enough so that people can visit it and be back the same day. No other pattern makes human sense.

“Actual developments during the last hundred years or so, however, have been in exactly the opposite direction: the rural areas have been increasingly deprived of access to worthwhile cities. There has been a monstrous and highly pathological polarisation of the pattern of settlements.”

In a bioregional society, the division between urban and rural, industrial and agricultural, population and

resources, would be replaced by an equilibrium, a symbiosis. On the one hand, the city would be necessary as a producer of certain kinds of goods, as a centre of artistic culture, as a source of the assembled civic virtues, though the city need not be of immense size—indeed, no larger than 50,000 or 100,000 people—and in fact ideally would replicate rather than grow so that instead of a single metropolis there would be a multiplicity of cities of modest sizes scattered throughout the bioregion. On the other hand, the country would be necessary as the prime source of food and water and the materials of shelter and clothing and artisanship and trade, and especially as the embodiment of the bioregional spirit of Gaea, whose presence should be felt daily by the inhabitants of every settlement, of whatever size.

### Historical Realities

Bioregionalism is no more than the modern version of a very old perception of the world held not merely by the Greeks but by virtually every preliterate society of which we have knowledge.

For Frederick Jackson Turner, the great Wisconsin historian, an inherent belief in bioregionalism formed the basis of a lifetime of studies culminating in his *The Significance of Sections in American History* where he showed that only by a consideration of American sectional, or regional, differences could one understand the patterns of settlement, migration, architecture, literature, and economic and political life: "We in America are in reality," he concluded, "a federation of sections rather than states."

Lewis Mumford knew the truth of bioregionalism when he put together the Regional Plan Association in 1923, an ambitious—and for a decade successful—attempt to create regional plans along geographical lines that would, in his words, mean the "reinvigoration and rehabilitation of whole regions so that the products of culture and civilisation, instead of being confined to a prosperous minority in the congested centres, shall be available to everyone at every point" and so that we may "eliminate our enormous economic wastes, give a new life to stable agriculture, and set down fresh communities planned on a human scale."

Howard Odum knew it when he started a highly honoured and remarkably multidisciplinary school of regionalism at the University of North Carolina in the 1930s and over two decades produced a series of scholarly books highlighted by the massive 1938 study, *American Regionalism*, all to the point of showing, as he put it, that "regionalism . . . represents the philosophy and technique of self-help self-development, and initiative in which each area unit is not only aided in, but is committed to the full development of its own resources and capacities."

And even the United States government, *mirabile dictu*, knew it, when in 1934 it authorised a National Resource Committee to study the regions of America and discovered "regional differentiation may turn out to be the true expression of American life and culture/reflecting/American ideals, needs, and viewpoints far more adequately than does State consciousness and loyalty."

Much today goes against the grain of regionalism, forcing the nation away from its natural contours toward the artificial unanimity of a monolithic plasticised government.

### Contemporary Trends

Another salient measure of the validity of the bioregional enterprise is that it accords well with the most basic—and complementary—political processes in the world today: first, the pressure from a series of mounting national and global crises that threaten nothing less than the collapse of the established order, and second, the concurrent trend toward the disintegration of imperial, continental, and national arrangements—what is called separatism, decentralism, or, to use a supposedly derogatory term, balkanisation. But in a sense we do not necessarily need to wait until then, however near that "then" is, because at least one form of the bioregional society is already taking shape, in the nascent separatist movements that have come into being in almost every corner of the globe within the last generation. They, too, represent an organic, inevitable, response to the disintegration of the contemporary order, a growing centrifugal force as industrialism spins more wildly about. As a global phenomenon, the current rise of these movements is something quite without precedent in history; it is, according to Eric Hobsbawm, "the characteristic nationalist movement of our time" and "an unquestionably active, growing and powerful socio-political force." An exhaustive elaboration would be exhausting, but it should be enough to note only the most active movements just within Europe, the continent where it might have been presumed that nations were the oldest, strongest, and most cohesive: there are the Bretons, Corsicans, Occitanians, and Alsatians in France, the Catalonians, Andalusians and Basques in Spain, the Welsh, Scots and Cornish in Britain, the Sicilians and Tyrolians in Italy, the Walloons and Flemish in Belgium, the Latts, Lithuanians, Estonians, Ukrainians, Georgians and a variety of Asians in the Soviet Union, the Turks and Greeks in Cyprus, the Croatians, Bosnians, Macedonians and Montenegrins in Yugoslavia—and that, I remind you, is the bare surface.

It is truly remarkable. The undeniable trend of these last forty years has been not to larger and more consolidated arrangements, but, everywhere in the world, to smaller and more decentralised ones. In the words of Harold Isaacs, "What we are experiencing is not the shaping of new coherences but the world breaking into its bits and pieces . . . We are refragmenting and retribalising ourselves."

And what is so interesting in this amazing process is the clear expression of the bioregional idea. For though it has long been acknowledged that the cultural aspects of these separatist movements are grounded in their special regional histories, from which they take their obvious and cherished differences of language and dress and music, the fact is that their political and social characters are every bit as rooted in the long, intimate, and knowledgeable association with their particular bioregion and its history. And the truths these movements embody, the apparently unquenchable truths, are in every case the product of the land they hold sacred.

### Desirable Visions

In treading upon the insubstantial ground of the future we take certain risks, and we must face the fact that the word "utopian" has become an epithet, a chastisement, for those who would dream of things that never were and imagine that they still might be. Yet it

is a necessary part of any political construct that it offers an image of the future that can be regarded as positive and liberatory and realistic and energising. This bioregionalism succeeds in doing.

For what the bioregional vision suggests is a way of living that not merely can take us away from the calamities of the present, the diseases of our quotidian lives, but can provide its own indwelling enrichments and satisfactions, a widening of human possibilities. Imagine, if you will, the joy of knowing, as we can imagine from the scholarly record, what the American Indians knew: the meaning of the changes of the wind on a summer afternoon; the ameliorative properties of everyday plants; the comfort of tribal, clan and community ties throughout life; the satisfaction of being rooted in history, in lore, in place; the excitement of a culture understandable because imminent in the simple realities of the surroundings. Imagine a life primarily of contemplation and leisure, where work takes up only a few hours a day—an average of less than four, according to the studies of nonliterate societies—where conversation and making love and play become the common rituals of the afternoon, and there is no scramble for the necessities of life because they are provided regularly, equally, joyfully and without charge. Imagine a life—and here I am paraphrasing an anthropologist's description of a California Indian tribe—where people feel themselves to be something other than independent, autonomous individuals . . . deeply bound together with other people and with the surrounding nonhuman forms of life in a complex interconnected web of being, a true community in which all creatures and all things can be felt almost as brothers and sisters . . . and where the principle of non-exploitation, of respect and reverence for all creatures, all living things, is as much a part of life as breathing.

However enchanting that image might be, the bioregional vision is even more important in that it actually has an air of the practical, the do-able, the achievable: it has the smell of reality about it.

For one thing, the idea of the bioregion is accessible to people, all kinds of people, for as Kevin Lynch notes in his *Managing the Sense of a Region*, "our senses are local, while our experience is regional." Lee Swenson, an early bioregionalist, has reported that when he took his bioregional slide show across the country it didn't take long for his audience to come up with some rough consensus about the territories they lived in that pretty well matched any ecological definition of their bioregions. If true, that suggests the process of organising around this issue, especially among those outside of the usual constituencies for social change, is made much easier.

Then, too, bioregionalism joins—or at least has the potential to join—right and left (or perhaps more precisely, it ignores right and left), and thus unite the communard with the NRA hunter, the homesteader and the conservationist, the antinuclear activist and the antipowerline farmer. The concern for place, for the preservation of nature, the return to such traditional American values as self-reliance, local control, town-meeting democracy—these things can ally many different kinds of political people, in fact they have a way of blunting and diminishing other and less important political differences.

Bioregionalism also has the virtue of gradualism, in that it suggests that the process of change—or organ-



ising, educating, energising a following and of reshaping, refashioning, recreating a continent—are, like the overarching processes of Gaea herself, not revolutionary and cataclysmic but, like the drift of the continents on their tectonic plates, steady, slow, continuous, regular and inevitable. One does not imagine bioregional civilization taking place by revolutionary decree—no matter whose revolution—or even, in truth, by legislative or administrative fiat. If one had to dictate or legislate the bioregional future it would never happen, because it would be resisted and sabotaged as crazy and utopian and impractical and un-American; it is only by the long and steady tenor of evolution that people will ease themselves into such a society as the alternative futures gradually come to seem senseless and the bioregional prospect becomes the only sane choice.

And finally, the bioregional vision does not demand elaborate wrenching of either physical or human realities. It does not posit, on the one hand, the violent interference with nature that so many of the scientific technofix visions of the future do—those for example, that ask for icebergs to be floated into deserts, or the Great Plains to be given over to concentrated nuclear power plants (it does not, for that matter, have anything to do with nuclear fission, the single most unnatural project humankind has ever devised), or rockets full of people to be fired millions of miles away into space colonies around the sun. And it does not imagine, on the other, the creation of some kind of unlikely and never-before-encountered superbeings as do so many of the reformist and radical visions of the future—those for example that promise "a new socialist man" without motives of greed or self-interest, or that plan by education or religion or therapy to create a populace living in aquarian harmony without human vices. On the contrary, bioregionalism insists on taking the world "as it is"—and people, as I have indicated before, as they are.

I hope I do not suggest with all of this that the bioregional project is blind to the chances of failure—or is unmindful of the pains that might attend the accomplishment of its ends. I am not suggesting sanguinity or quiescence or detachment or passivity, just because I am suggesting hope and desirability. I mean merely to underscore that element of the project

that speaks to the Biblical admonition: "Where there is no vision the people perish."

Lewis Thomas concludes his fascinating *Lives of a Cell* with this observation:

"Viewed from the distance of the moon, the astonishing thing about the earth, catching the breath, is that it is alive. The photographs show the dry, pounded surface of the moon in the foreground, dead as an old bone. Aloft, floating free beneath the moist, gleaming membrane of bright blue sky, is the rising earth, the only exuberant thing in this part of the cosmos. If you could look long enough, you would see the swirling of the great drifts of white cloud, covering and uncovering the half-hidden masses of the . . . It has the organised, self-contained look of a live creature, full of information, marvellously skilled at handling the sun."

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**Looking up at the skyscrapers of New York, during the height of the oil crisis, Fritz Schumacher remarked, "I wonder how many people will want to climb to the fortieth floor when there is not enough electricity to run the elevators?"**

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And just one year later, in 1975, the British atmospheric chemist James Lovelock described in the magazine *New Scientist* a perception of the world that had come to him and his colleagues one day:

"It appeared to us that the Earth's biosphere is able to control at least the temperature of the Earth's surface and the composition of the atmosphere. *Prima facie*, the atmosphere looked like a contrivance put together cooperatively by the totality of living systems to carry out certain necessary control functions. This led to the formulation of the proposition that living matter, the air, the oceans, the land surface, were parts of a giant system which was able to control temperature, the composition of the air

and sea, the Hp of the soil and so on as to be optimal for survival of the biosphere. The system seemed to exhibit the behaviour of a single organism, even a living creature."

And out of this new perception Lovelock and colleagues created a whole new scientific hypothesis on the nature of the biosphere. Or should I say a very old hypothesis? For when they went in search of a name for this hypothesis they sought out William Golding, the novelist. And what did he suggest, immediately? As Lovelock writes: "He suggested Gaia—the name given by the ancient Greeks to their Earth goddess."

So—after all, there seems no doubt about it. The earth, the biosphere, is alive, a living creature, one and visible, containing within itself all living creatures. Like any living entity it can be stressed, or injured, or diseased, as it surely is now. But it will live—of that we can be sure, one way or another, and it will resettle itself, restore itself, with humankind or without. It behoves us, as nothing in the long history of humankind I believe has so far behoved us, to come to this literally most vital understanding and, before it is too late, give up those demonic practices that threaten our fundamental forms of existence and ultimately our existence itself. We must make the goddess Gaea our lives, even though that may be, as John Todd has suggested, a change of consciousness as profound and as wrenching as that which accompanied the origination of agriculture some 10,000 years ago. But then, what other choice, really, do we have?

**Kirkpatrick Sale** is an author, lecturer, and Trustee of the E.F. Schumacher Society. His work *Human Scale* is an important companion to Schumacher's *Small is Beautiful*, documenting and substantiating the concept of decentralised living, working, playing and planning units. He is currently at work on a book about *Bioregionalism*.

Mr Sale is interested in establishing a Decentralist Centre that would collect the papers and publish the works of E.F. Schumacher and other human scale philosophers. Write Mr Sale at 113 West 11th Street, New York, NY 10011 should you be willing to help further this initiative.

## Cranks have their Uses

Leopold Kohr tells this charming little story in his foreword to MaxNeef's book *From the Outside Looking In: Experiences in 'Barefoot Economics'*. (As pointed out on p 140, Max-Neef is a winner of the 1983 Alternative Nobel Prize.)

"Some 800 metres higher up the mountains from my sturdy little inn lives Josef Haid, an old schoolfriend from my Salzburg days. He looks back on a career as a prestigious business consultant who turned the fortunes of not a few companies from a downhill slide to new heights of success. But what he considers his real life's work is not his worldly achievement but a small volume of thoughts entitled *On the Side of Life*. When his secretary typed it, she begged him 'for heaven's sake' not to let it transpire to his clients that he was the author. 'They will believe you are a crank' she said, which brings to my mind my late great friend Fritz Schumacher who, when asked whether he was not often considered a crank, replied: 'Yes, but I never minded, because a crank is a tool which is simple, small, inexpensive, economical, efficient and'—added the author of the subsequent international bestseller *Small is Beautiful* — "it makes revolutions."

Edward Goldsmith

## Untimely Death of Two Ecologists

Earlier this year we were appalled to hear of the brutal killing in Shropshire, near her home, of Hilda Murrell, the famous English rose grower. For many years Miss Murrell, who was 78 years old, has worked indefatigably to make the environment a better place, fighting desecration and the remorseless spread of industrialisation into the countryside. In the last few months of her life, and despite her considerable age, she became determined to give evidence at the Sizewell B PWR public inquiry, now nearly at the end of its second year, against what she considered to be the gross irresponsibility of the nuclear industry in producing wastes for which there could be no safe solution. Miss Murrell, educated at Cambridge University before moving into the family rose growing business, had already drafted her evidence when she was murdered, and her nephew, Robert Green, formerly of the Royal Navy, will take her place when the inquiry reconvenes in September.

Her evidence, carefully and skillfully argued, does not mince its words in castigating government and nuclear industry reports for their advocacy of a dumping policy in the face of considerable ignorance as to the consequences. She cites the 1976 Royal Commission's Report on Environmental Pollution in which it states unequivocally "... there should be no commitment to a large programme of nuclear fission until it has been demonstrated beyond reasonable doubt that a method exists to ensure the safe containment of long-lived, highly radioactive waste for the indefinite future..." But ever since that Report, as Murrell points out, the nuclear industry has rushed from one idea to the next for getting rid of waste, without thinking for a moment that it is the entire enterprise that is misbegotten. Meanwhile a quarter of a ton of plutonium and a host of other

deadly radionuclides have found their way into the Irish Sea.

Miss Murrell concludes in her evidence that "The inescapable burden now inflicted in posterity imposes a straight moral choice, which was not faced in the beginning but which must be faced now. Even a desperate need for energy would not justify creating these worst of all pollutants whose control for merely a few centuries (in the case of High Level Waste) we cannot guarantee, far less that of the long-lived actinides which are forever. We have not even a moderate need for this technology, never mind a desperate one.

"This is a failed and dying industry, which is a major liability and should be closed down. The fact that plans can be made for adding to it shows an unbelievable degree of irresponsibility and stupidity in all concerned."

The other death, equally shocking, was of another *Ecologist* subscriber, Professor David Cusack of the University of Colorado. Cusack, whose article *Quinoa—Grain of the Incas* appeared earlier this year in *The Ecologist* (Vol 14, No 1, p 21, 1984). He had been attending a conference on South American indigenous crops in Bolivia. The conference over, he went to visit some 11th century ruins high in the Bolivian Andes, at Tiawanacu, some 45 miles away from La Paz, along a dirt track. There he was shot and killed by an unknown assailant, the motive for the murder, as was that of Hilda Murrell, remaining a mystery.

Dr Cusack, who at the time of Allende's downfall was in Chile, about which he later wrote a book, was best known as an agronomist and became particularly interested in food growing possibilities in the Andean highlands. He quickly came to appreciate that many of the indigenous crops, and especially quinoa, were not only particularly suited to the high altitude dry climate of the Andes but were of excellent nutritious value. Such crops had been in retreat first as a

consequence of the Spanish conquest of the 16th century, and later as a result of the emphasis on high yielding 'Green Revolution' wheat.

In 1981 David Cusack founded the Sierra Blanca Associates, a Colorado-based non-profit corporation, which was established to help raise the status of crops such as quinoa both by promoting their use in their countries and habitats of origin, but also by carrying out experiments on the transfer of such crops to new environments — to Colorado for example — the purpose being to help create a wider, more commercial market, and also if possible to improve the germplasm for increasing the crop's versatility.

As it happened, Cusack achieved success with growing and marketing quinoa in the United States without ever living to know it. Indeed, after two years of experimental plantings in Colorado's San Luis Valley, quinoa was introduced in a health food shop in Boulder. It sold out within one day, the day before Cusack was shot.

Cusack's work with the Sierra Blanca Associates will continue, Dr John McCamant from the University of Denver taking over as chairman and president.

Just before he died Cusack wrote a few lines on the Inca site he was visiting.

"Noon, Tiawanacu. Just for a moment I write a few lines here at this legendary birthplace of civilization, where several thousand years ago the progenitors of the Incas built a stone city and a gateway that opens directly to the sun at each equinox. I'm struck by the attitude and vision of grandeur. I stopped on the hill overlooking the fortress.

"The land, the clear sky and floating clouds, the wind through the dry grass, the cracked red earth and the monoliths of a distant past, so like the ranch over the Petrified Forest of my youth, I feel very peaceful here. Time stops."

His last words were "... "Autumn, soon winter. The wind spirit whispers to me au revoir."

Peter Bunyard

## Waves and other clean energy

The British wave energy programme is about to bear fruit. The £15 million of taxpayers' money, the six years of dedicated work by teams of scientists, professional engineers and civil servants are now to prove their value—for Norway. That country's Department of Energy, together with a leading manufacturer of water turbines for hydro-electric schemes, are together embarking on the construction of the first wave power station. It will be a magnet for countries which are burning expensive, imported oil to make electricity. It will provide Norway with a thriving export industry as well as a source of clean, nonpolluting, renewable energy.

British wave energy researchers will not direct their bitterness towards Norway. But they will feel growing anger over Britain's failure to provide support for their efforts and to go ahead with the building of prototypes of the main devices. We drew back at just the point where Norway is proceeding.

Our people are doing their best to help Norway in the battle with nature. Her model has been tested in the Cockerell wave tank near Southampton. That tank cost us £500,000. It was 'opened' officially in September 1980 by Mr John Moore, then Energy Under-Secretary, who used the event to answer an allegation by me that the Government was trying to shut down the wave energy programme by cutting its funds. Not so, he said. "Whatever other problems our wave energy researchers may face, lack of Government support will not be among them." Within 18 months, Government support had virtually ended.

The testing was carried out by Dr Brian Count, head of the CEBG's wave energy team. He spent five weeks in Norway as consultant to the project. Another British adviser was Dr David Evans, Reader in Applied Mathematics at Bristol University and inventor of the Bristol Cylinder, one of the devices killed off by Nigel Lawson during his brief and disastrous period as Energy Secretary.

The Norwegian device is an Oscillating Water Column standing on the seabed on the shore. It looks remarkably like the invention of the National Engineering Laboratory. The power take-off is through a Wells Turbine, the invention of Professor A.A. Wells and a team at Queen's University, Belfast.

The distinctive Norwegian contribution is the addition of two "harbour walls" which reach out into the waves and help to capture more of their energy. This should increase the efficiency and thus reduce the cost of electricity from the device. It will have an installed capacity of 350-400 kW and will cost probably less than £500,000. Plus of course the £15 million which we spent on the "learning curve" then threw away.

No-one is suggesting that the Norwegians, who enjoy good personal relations with the British wave energy teams, have done anything improper. That allegation is directed solely at the British Government.

The Norwegian wave energy station will be on an island off Bergen, starting across the North Sea towards Torness and Sizewell and drawing the same water. And it could well be generating electricity before we have even received the Inspector's report on the Sizewell Inquiry which is now moving inexorably towards completion of its second year. It is providing a goldmine of information.

For instance, the CEBG's evidence on the renewables includes a table showing the "firm power" that can be obtained from a wind farm compared with Sizewell B. With 1,210 wind turbine generators each of a rated power of 2.5 megawatts, we should receive 890 MW compared with 900 MW from Sizewell B. A mere 10 MW of fossil fuel plant is needed to make good the difference.

The CEBG's research into wind power is impressive—but it is confined to on-shore wind farms and rests on the argument that there is not enough space in Britain—Sir Waltar Marshall has said that 1,000 machines of 3 MW size would be needed, spread over 300 square



The Norwegian device, sitting in a gap blasted in the rock on the shore of an island off Bergen. A Norwegian artist's illustration of what it will be like.

miles, to match a power station. But what about off-shore? For this, we have confined our research to discussions with the International Energy Agency which has the appeal that it has never produced a single watt.

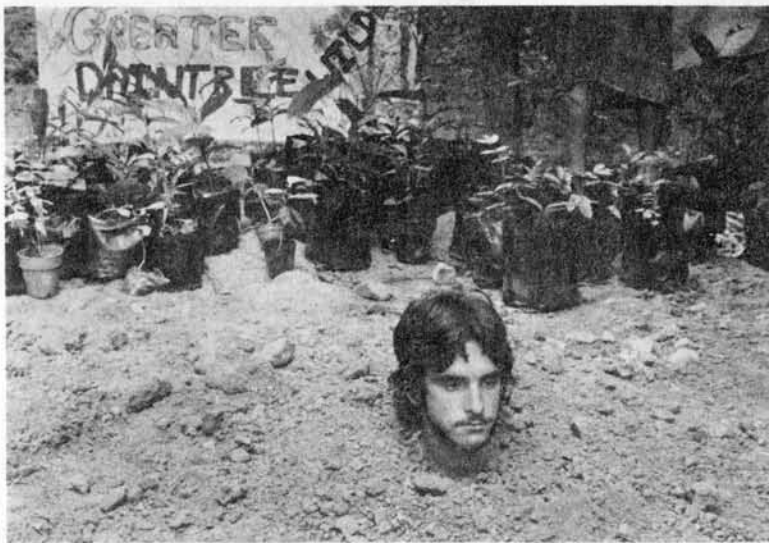
Another British asset is geothermal energy. There are millions of gallons of scalding hot water swirling around in an underground lake beneath Southern England. The CEBG offered the grounds of Marchwood power station so that the Department of Energy could drill for it. After £2 million had been spent, and the hot water had been found in abundance, the CEBG broke the news that it had no use for the hot water because it was closing Marchwood, which was oil-fired and therefore too expensive to run. Now, with the coal strike going on, the oil-fired power stations are being re-activated but they will have no "free" hot water because of the short-sightedness of the CEBG. The Department of Energy has since evened the score by offering money to the city of Southampton to drill for hot water under a civic centre—and then pulling back when problems arose. Hot water from the Hampshire Basin and six other sites would weaken the case for nuclear power, which is based on the argument that the uranium is cheap, while coal and oil are expensive. Reduce the cost of heating the water and you reduce the case for nuclear power...

David Ross

(Author of *Energy from the Waves*, Pergamon)

# In Defence of Daintree

## Australia's Tropical Rainforest



This photograph, taken by Peter Mitchell during last December's action, is of a blockader buried directly in the bulldozer's path. One of his ankles is chained to a concrete slab buried at the foot of the hole. He will have to be removed before the dozer can proceed.

Once more, conservationists are gathering in Australia's far north to prevent bulldozers from moving back into the coastal lowland tropical rainforest wilderness. In December 1983, a small number of conservationists gathered for a spirited defence of this forest. They physically blocaded the local council's bulldozers in a series of actions which confounded both workers and a strong contingent of police.

The month-long direct action campaign witnessed 40 arrests while conservationists successfully utilised the resources of the natural environment. They locked themselves high up in the trees, buried each other up to their necks in the path of the machinery, and suspended themselves from ropes between trees marked for felling. Police were forced to employ rescue equipment and a lot of hard work to extract and arrest the demonstrators. Hostility was succeeded by incredulity as police swung from trees and dug protestors out of the ground.

When the rains started in earnest, creeks flooded the access routes. One critical section of the track took on the appearance of a muddy football field in the late stages of a match as the environmentalists, wet, muddy and slippery, successfully brought the dozers to a halt.

The police then stated that they would be returning in six hours with reinforcements and helicopters. That was six months ago, and the blockade of logs at the start of the new scar in the forest still stands. The chains with which the protesters bolted themselves to trees or to the earth, are rusty but ready for use. The weather has cleared and the council has stated their intention to resume work on the road. Sixty to eighty conservationists have set up camps at both ends of the proposed road and more are arriving daily.

The proposed road is only the thin end of the wedge regarding development in this splendid Greater Daintree wilderness. The Queensland Forestry Department

has plans to log virgin rainforest as access becomes possible. Tin miners are working nearby. Real estate developers (who have been carving similar lowland rainforest into two acre residential blocks nearby) are anxious to expand their activities.

The forests of the Greater Daintree are refugia for many species like Bennets tree kangaroo—rare, endangered, endemic. Their habitat is suffering accelerated destruction although much of the flora and fauna is undescribed and awaits study.

Botanists regard the area as a living museum. Studies of fossilised pollen show that the forest has inhabited the region continuously for over a hundred million years, undisturbed by volcanic activity or incursions by the sea. Before continental drift broke Australia apart from Antarctica, South America, Africa and the rest of Gondwanaland, the forests of Greater Daintree existed, indeed the presence there of the most primitive of all flowering, fruiting plants, lead scientists to speculate that that region may have been the birthplace of flowering plants upon the earth.

The continued existence of the rainforests beyond the first few years of the next century is in doubt unless action is taken immediately. In Australia as in the rest of the world, lowland tropical rainforest is the richest, most diverse and most threatened rainforest type.

Australia, as the only developed country to contain tropical rainforest, has the moral duty to show the way to those poorer nations which will have to take steps to preserve their tropical rainforests if the genetic future of the earth is to be maintained.

*John Cohen and John Seed*

If you are interested in more information about this issue or in finding out about the world rainforest action network which is now forming, write to the Rainforest Information Centre, Box 368 Lismore, N.S.W., Australia.

# Eucalyptus: The Controversy Continues

In August last year, farmers from Karnataka, South India, marched en masse to a nursery at Holatalli and pulled out all eucalyptus seedlings inserting tamarind seeds in their place.

Five days later, another group of farmers from Neginahalla village in Koratagere Taluk moved into a forest nursery at Buddhigavi and pulled out eucalyptus saplings.

In both instances, the local population turned out to support them when the farmers were arrested by police.

From these first few grass-root protests against the Indian government's afforestation projects using eucalyptus species, a movement similar to the Chipko has sprung up in the Western Ghats of Karnataka—the 'Apiko'.

The State Farmer's Association in December 1983 served an ultimatum to the Tanata Government to immediately stop planting and distribution of free eucalyptus seedlings to farmers.

"If the Government fails to concede our demand, we will start uprooting eucalyptus trees", Association Convener Professor MD Nanjundaswamy warns.

This rallying of farmers emerged from the ensuing debate on issues related to social forestry as a strategy for providing the people with their requirements for fodder, timber, firewood and green manure, while arresting the deepening ecological crisis.

For various reasons, the species most used

in India's social forestry programmes has been Eucalyptus.

Eucalyptus plantations is now the main supplier for pulp-based industries.

Eucalyptus plantations are not confined only to India. According to the FAO 1981 report on 'Forest Resources of Tropical Asia', the Eucalyptus species are the most common fast-growing hardwood species for industrial purposes, mainly for pulp and paper in plantations in the region, including India. Among the countries using the eucalyptus are Burma, Philippines, Papua New Guinea and Malaysia.

What makes India different from these countries is that farmers, villagers and scientists are increasingly aware that Eucalyptus plantations deplete water resources, soil fertility and increase soil erosion.

Two Indian scientists deeply involved in the issue claimed that the large-scale expansion of Eucalyptus monoculture on food producing land in India was a failure both as social and agro-forestry.

Vandan Shiva and J Bandyopadhyay said that it failed at the social forestry level because it bypassed the objectives of improved satisfaction of the basic needs and increased community participation—the core of social forestry.

"It failed at the agroforestry level because instead of being a support for agriculture, farming of Eucalyptus for industrial raw material undermined agriculture and food production.

"We must not forget that social forestry was offered as a solution to the problems created by commercial forestry. Reducing it to another purely commercial affair may succeed in solving the resource crisis in the pulp-based industries while completely negating its proclaimed objectives and accentuating the food crisis," they asserted.

Well known plant scientists, Hall, Barnard and Moss in their book 'Biomass for Energy in Developing Countries' take the stand that "In case where land is scarce, agroforestry systems have too much to offer. Agroforestry involved the intercropping of trees with field crops, a practice which can allow food and fuel to be produced from the same land.

"The crops must be chosen carefully so that they complement rather than compete with each other. Eucalyptus, for example, is not a good agroforestry species due to its high moisture demand and its tendency to produce toxic substances", they added.

While Indian scientists agree with these findings, Indian government officials on the other hand stressed that "there is yet no evidence to show that Eucalyptus affects the environment".

Vandana and Bandyopadhyay content the policy is no surprise when politics overtake scientific arguments. They say, "It is a matter of national shame that our foresters are indiscriminately propagating Eucalyptus without being accountable for its social-economic or ecological fallout."

While scientists and government officials lock horns with each other, farmers and villagers turn to practical action—uprooting Eucalyptus saplings.

*Appen Features F5/84*

## Pinus & Eucalyptus no answer

In order to meet the increasing demand for paper products and the pressing need for fuelwood, the Sri Lanka Government has implemented a massive afforestation programme which consists of large scale Pinus and Eucalyptus plantations. This policy was based on research conducted in other countries. Whether plantations of Pinus and Eucalyptus have met the criteria of other nations does not help us. Sri Lanka possesses her own unique climate, soil, water, flora and fauna which render research done elsewhere useless. What matters is that any government afforestation programme fulfills the needs of the people here. I question the ability of Pinus and Eucalyptus monocultures to do this.

I have spent some time discussing with villagers the changes the planting of these monocultures have wrought in their lives. The first point mentioned by everyone was the lack of water in the area since these monocultures were planted. Water is of vital importance to every farmer; the amount of it determines that the farmer will have enough income to see him and his family through until the next harvest.

These villagers attributed the lack of water to the Eucalyptus trees which suck up water and thus cause a drop in the water table, the source of water during the dry periods. Has any research been done on our Island to check this out? How can we grow enough food to feed our people if we do not have enough water? It is rumoured that Eucalyptus begins to return water to the soil after 20 years. Even if this is so, of what use is it to us if the trees are cut before this time? Can we afford 20 years of drying up? A farmer having 40 years of experience has gone so far as to attribute the present lack of rainfall to Eucalyptus. He says that these trees have changed the climate as they do not attract the rains as do the native species. Here is yet another area in which research needs to be done.

The villagers also pointed out to erosion as being a major problem. How effective Pinus and Eucalyptus are at preventing the loss of precious top-soil is debatable. Many villagers said that there has been slightly less erosion in comparison to Patna grasslands since these plantations have been grown. To them this small gain has come from great cost. The alleopathic nature of Pinus and Eucalyptus have rendered the soil less fertile. Are there not any endemic, quick growing colonising species of trees which could be planted instead? Could not a few rows of such species control erosion just as well or better than plantations of Pinus and Eucalyptus? These rows could serve as shelter belts allowing local species to take root in their shade and benefit from the rich organic matter they shed. As more trees grow, erosion would be lessened further and soil fertility would actually be increased. Soil insects would decompose the leaf litter, making nutrients available to the plant. Native soil insects are incapable of decomposing Pinus and Eucalyptus organic matter.

There are many varieties of fine endemic fruit, timber and fuelwood trees; would not an afforestation scheme incorporating a high diversity of endemic species serve the needs of our people better? Those with whom I spoke saw forests of a variety of native species as most useful to them and to their land.

One farmer describes the Pinus and Eucalyptus monocultures as a "green desert". I am asking if our Government has fully and carefully considered the issue of afforestation; has research been done in Sri Lanka to support the establishment of Pinus and Eucalyptus plantations as the best means to ensure the health of our people and the health of our land, where our future and our children's future is at stake? Quick solutions and easy answers often prove themselves illfit to the problem when considered in its totality.

*Mahinda Fernando*

# The Liberation of Life\*

by Charles Birch and John Cobb

Reviewed by Warwick Fox

As its subtitle suggests, *The Liberation of Life* by Charles Birch (Challis Professor of Biology at the University of Sydney) and John Cobb, Jr. (Ingraham Professor of Theology and Director of the Centre for Process Studies at the School of Theology, Claremont, California) is a work of extraordinary breadth. Birch and Cobb are concerned with nothing less than the liberation of life in both theory and practice: theory because the authors are concerned with reinvigorating the ways in which we think about life from the molecular to the cosmic level; and practice because they are urgently concerned with the liberation of social structures and human behaviour that would both flow from and encourage such a changed way of thinking.

The philosophical inspiration for Birch and Cobb's challenge to what the embryologist and theoretical biologist C.H. Waddington has referred to as the Conventional Wisdom of the Dominant Group, or COWDUNG for short, derives from the difficult, neglected but rewarding "philosophy of organism" of Alfred North Whitehead (1861-1947). Moreover, the book is dedicated to the distinguished American philosopher Charles Hartshorne who has himself been greatly influenced by Whitehead. It was Hartshorne, for example, who, amongst many other insights, suggested that the "pathetic fallacy" (the so-called 'fallacy' of attributing feeling to 'things') should be "balanced against the possibility of a 'prosaic fallacy': supposing the

world to be as tame as our sluggish convention-ridden imaginations imply."

Clearly, if the purpose of this book, its substantive breadth, and its philosophical grounding are anything to go by then we are dealing with a work that opens up and changes one's vision of the world. And that is precisely Birch and Cobb's design.

The authors believe that "in the end, our conceptual environment, not science and technology, will determine the future" (p 10) and, further, that "if we can liberate the concept of life we might better be able to liberate life itself" (p 68). Their first two chapters therefore consider our conceptualisations of life at the levels of the cell, the organism and the population, and in terms of modern evolutionary theory. The import of these chapters is to demonstrate the necessity for an ecological understanding of living and evolutionary processes. It is empirically incorrect and philosophically unprofitable, they argue, to attempt to understand the behaviour of molecules, organisms or populations in the absence of their interrelationships: "at each level ecology is the most important category for considering the phenomena" (p 42). Hence, Birch and Cobb's insistence that we think of these three levels of existence in terms of 'molecular ecology', 'organismic ecology', and the more familiar 'population ecology'. This refusal to conceptually abstract the organism out of the interrelationships that constitute its environment naturally leads to the view that "evolution should be seen ecologically through and through" (p 4). Birch and Cobb argue further that such an understanding of evolutionary processes must make room for 'purpose' as a

third explanatory factor in the evolutionary story—the other two being Monod's 'chance' and 'necessity', referring to the roles of mutation and natural selection respectively. The purpose to which Birch and Cobb subscribe, however, is not that of a cosmic destiny (à la Teilhard de Chardin) but rather that of the individual organism in an open-ended evolutionary process.

Having given the reader a strong taste of ecological thinking in the realms of biology and evolutionary theory, Birch and Cobb proceed in their third chapter to the philosophical heart of their argument. Herein is contained an illuminating exposition and critique of the primary established 'models of the living': the dominant mechanistic model (organisms are, or can be thought of as if they are, complex machines—this remains the Conventional Wisdom of the Dominant Group); the vitalistic model (organisms differ from machines in that they possess some mysterious life force or vital spirit); and the emergent evolution model (organisms differ from machines in that they possess properties which have mysteriously 'emerged' during the course of evolution e.g. the emergence of consciousness). To these models Birch and Cobb contribute their own which they call, naturally enough, the ecological model.

The problem with vitalistic and emergent evolution models of life, Birch and Cobb argue, is that "they leave the mechanical model unchallenged in its sphere . . . (that is, these models) . . . show that livingness and mentality are not properties of machines, but they do not explain how they come to characterise organisms" (p 79). The ecological model, in contrast, challenges the

\*Cambridge University Press 1981, 353 pages. £22.50

mechanistic model in its own sphere: "An ecological model of living things, in distinction from a mechanistic model, is one which pictures the organism as inseparably interconnected with its environment" (p 80). Now, on first reading, this observation may appear reasonable but trite, and not as much of a problem for the mechanistic model of life as the authors suppose. However, this is to miss the profound implications of the ecological model as developed by Birch and Cobb against the background of Whiteheadian 'process philosophy'. The genuinely radical aspects of this elaborated ecological model can best be approached as follows. Our normal way of conceiving the world (which the authors refer to as 'substance thinking') is to think of entities (or substances) as existing relatively independently of one another. Relations between entities so conceived are referred to in philosophical terms as 'external relations'. This is because entities are thought of as existing independently of their relations and then entering into relations. Existence precedes relations, if you like. An entity's relationships are thus conceived of as 'external' to it not so much because they are considered to be 'outside' it as because they are *not* considered to represent constitutive or necessary aspects of the entity's character or existence; they are considered to be secondary to the entity's existence rather than essential to it.

It is precisely this 'substance thinking' formulation of the world, this 'normal' way of conceiving the world, that Birch and Cobb seek to undo. When they say that "the organism is inseparably interconnected with its environment", the key word is inseparably. They specifically mean that the relations of the organism are constitutive or necessary aspects of its character or existence. Moreover, this holds for any entity, whether living or not, since from the perspective of the ecological model existence means relations. Thus, in the philosophical terminology exploited by these authors, the ecological model views an entity's relations as 'internal' to it since "the idea of an internal relation is of a relation which is constitutive of the character and even the

existence of something" (p 88).

With this elaboration of the ecological model, it is a short step to the realization that internal relations can only characterise events (or processes), not substances (or things), since the latter are by definition understood in terms of independent existence. It follows, argue Birch and Cobb, that "the shift from the mechanistic to the ecological model cannot fully occur apart from the more difficult shift from substance to event thinking" (p 87). The following quote should shed considerable light on what Birch and Cobb are getting at here:

"Even when one thinks of an event one is still too likely to bring from substantialist habits of mind the notion of something self-contained and self-sufficient. If so, one will have failed to attend sufficiently to the evidence, whether from physics or biology. An electromagnetic event, for example, cannot be viewed as taking place independently of the electromagnetic field as a whole. It both participates in constituting that field as the environment for all the events and also is constituted by its participation in that field. In abstraction from that field it is nothing at all. It does not have independent existence and then relate to the field. It is constituted by the complex interconnections which its place in the field gives to it. The same is true when the event in question is the functioning of a gene, a cell or a rabbit. This functioning does not exist in itself apart from its total environment and then relate to the environment. It is a mode of interacting, of being affected and affecting" (p 86-87).

By way of the ecological model, then, Birch and Cobb seek to introduce us to a 'process' conception of the universe. According to this view, we are deluding ourselves if we continue to see the world as consisting of self-contained and self-sufficient things/entities/substances. Instead, we must view the entire cosmos as an infinitely complex matrix of interrelated events. Things, so-called, are in actuality enduring societies of events.

It should be clear by now that the implications of the ecological model are anything but trite. To some, however, they may appear to run so much against the grain of reasonableness as to be absurd. Yet, as it happens, the ecological model

proposed by Birch and Cobb is so far entirely consistent with the view of the ultimate nature of the physical world proposed by some of our leading physicists. For example, David Bohm, Professor of Theoretical Physics at Birbeck College, University of London, understands that quantum theory leads us "to a new notion of unbroken wholeness which denies the classical idea of analysability of the world into separately and independently existing parts . . . Rather, we say that inseparable quantum interconnectedness of the whole universe is the fundamental reality, and that relatively independently behaving parts are merely particular and contingent forms within this whole" (In F. Capra, *The Tao of Physics*, Fontana, 1976 p 141-2). Or consider Capra's summary of the 'bootstrap' hypothesis of Geoffrey Chew, Chairman of the Physics Department at Berkeley: "In the new world view, the universe is seen as a dynamic web of interrelated events. None of the properties of any part of this web is fundamental; they all follow from the properties of the other parts, and the overall consistency of their mutual interrelations determines the structure of the entire web" (ibid p 302).

### Dual Aspect of Nature

If we accept this 'seamless web' view of the universe then it is clear, as Birch and Cobb demonstrate in their fourth chapter, that our traditional bifurcations of reality into the 'human' and the 'natural' and into the 'living' and the 'non-living' must collapse. Moreover, the collapse of these dualisms is all the more complete if we also accept, as Birch and Cobb are inclined to, the arguments of Bohm, Hartshorne, Whitehead, and others, suggesting that it is reasonable to consider all things, whether living or not, as endowed with some form of subjectivity. Thus, every 'thing' can be considered as possessing both an objective and a subjective aspect. In a couple of his better known phrases, Whitehead put the kind of view Birch and Cobb are arguing in this manner: "The aboriginal stuff, or material, from which a materialistic philosophy starts is incapable of evolution . . . (hence) . . . Biology is the study of the larger organisms; whereas physics is

the study of the smaller organisms" (*Science and the Modern World*, Fontana, 1975 (originally 1926) p 133, 128). Here we enter into the development of a sophisticated panpsychism or view of *Mind in Nature*—to quote the title of a 1977 collection of essays edited by Cobb and Griffin and which, incidentally, contains contributions from leading biologists, geneticists, philosophers, physicists, and zoologists.

Given an underlying continuity between all living things (and, indeed, between life and non-life), it follows that the human treatment of other living things, which "has heretofore been directed in large part by assumption of utter discontinuity" (p 140) must be thoroughly revised. In their fifth chapter, Birch and Cobb therefore set about the task of furnishing a more appropriate 'ethic of life'.

In developing the ethical implications of their ecological model, the authors first indict the dominant traditions of secular Western ethics, and modern economic theory along with them, on charges of anthropocentrism—or human chauvinism. They correctly argue that the two most influential systems of normative ethics, utilitarianism and Kantian categorical ethics, both imply in their consistent application "that everything other than the human is appropriately considered only as means to human ends" (p 150). Modern economic theory, too, "is based on the same assumption" (p 150).

In contradistinction to these anthropocentric theories of value, Birch and Cobb argue that the realisation that all entities are both objects and subjects brings with it the realisation that all entities are both means to the ends of others *as well as ends-in-themselves*. Couched in more philosophical language, we can say that nonhuman entities do not merely possess instrumental value (that is, they are not valuable only to the extent that they are of *use* to humans), they also possess intrinsic value since their experience (or subjectivity) is of value to *them*. Hence, Birch and Cobb's ethic of life: act so as to maximise richness of experience in general which includes the richness of experience of the nonhuman world.

180

The concept of richness of experience is borrowed from Waddington who argued that "the general anagenesis of evolution is towards what may crudely be called richness of experience" (p 145). Birch and Cobb agree that the concept is a crude one but are nevertheless persuaded that "even in its crudest form it offers us considerable practical guidance" (p 154). Specifically, the injunction that "one should promote richness of experience wherever possible" (p 164) enables us to expand our moral horizons to encompass the nonhuman world while at the same time avoiding the extreme position advocated by Albert Schweitzer, for example, that all life is of equal value. Rather, we must recognise that capacity for experiencing varies between different types of entities, and that intrinsic value varies accordingly. Thus, argue Birch and Cobb, "the intrinsic value that can be attributed to the subjective experience of events at the sub-atomic, atomic and molecular levels is so slight that for practical, and therefore ethical purposes, it can be safely ignored. The same is true of mere aggregates of events such as rocks" (p 152). Intrinsic value is then held to increase with cellular organisation in plants, and to increase correspondingly with increasing central organisation and nervous system complexity in animals.

#### **Killing: Where does Morality start?**

If we accept this view, which can to some extent be considered as moral philosophy catching up with the biological news, then we must be prepared to grant that animals of comparable nervous system complexity to humans also possess comparable intrinsic value. It is therefore arguable, for example, that the killing of a cetacean is the moral equivalent of manslaughter or homicide depending on the circumstances surrounding the crime. In this regard, Birch and Cobb readily accept that "porpoises make claims upon us beyond those made by tuna and sharks" (p 155) and argue, for example, that the lives of porpoises are more important than the *financial* welfare of those Japanese tuna fishermen who slaughter porpoises because they compete with them for tuna. But in terms of dis-

mantling our anthropocentric attitudes, the authors do not press home the more telling, if hypothetical, comparison, that is: given our knowledge of their relative nervous system complexities, do we have *any* grounds for considering porpoises as having less intrinsic value than the Japanese fishermen themselves or, more generally, can we differentiate the moral worth of cetaceans and humans?

Other questions regarding relative worth also arise from the richness of experience argument. For example, while a mountain has unquestionably greater instrumental (or use) value to all forms of life than, say, a single-celled plant or a worm, we must, according to Birch and Cobb's criteria, ascribe greater intrinsic value to the plant or the worm. This follows because capacity for experiencing and therefore intrinsic value, is not a function of the *number* of events that constitute an entity (even though all have a subjective aspect) but rather a function of the *level of organisation* of these events. On this reasoning, a mountain, like a rock, is a "mere" aggregate—albeit a mighty big aggregate—of sub-atomic, atomic and molecular events, whereas the events constituting the plant and, especially, the worm possess a higher level of central organisation, which confers a greater capacity for experience. However, I suspect many would intuitively want to protest that there are important differences between a rock and a mountain and, further, that a mountain is in some sense of greater value than a plant or a worm *irrespective* of its use value to humans or the many other forms of life it may support. Does this protest reflect the illogical nature of our intuitions or the incompleteness of Birch and Cobb's ethical system? The authors could no doubt argue that our intuitions are led astray by our inability to truly separate the mountain's use value from what we like to think is its intrinsic value. They may be right. On the other hand, mystics, mountaineers and television viewers might still want to insist that, quite apart from even their aesthetic use to us, the most organically lifeless of snow-covered mountain peaks nevertheless have a life or power of their own that confers great intrinsic worth. It is at

this point that the rational intellect runs into what Theodore Roszak has referred to as the 'rhapsodic intellect': it is here that the words of the scientist must end and the silence of the mystic begin.

But despite the debates over relative value that arise from this as from any other ethical system, Birch and Cobb's elaboration of their richness of experience ethic provides us with an arguably more complete, more defined, and more practical set of obligations towards other humans, nonhuman life and the biosphere itself than do other recent attempts to extend our moral universe out from its anthropocentric base. The authors remain aware, however, that "thought at this rational ethical level does not capture the full meaning of life. Human beings are more deeply moved by the way they experience their world than by the claims ethics makes on them" (p176). In their sixth and final chapter devoted to the liberation of our conceptions of life, the authors respond to this challenge by embarking on an admittedly speculative discussion of their grounds for trusting Life—spelt here with a capital L to refer to the principle of life or the ground of life rather than life in any of its particular manifestations.

### Faith in Life

Any discussion of faith in Life is bound to be deeply personal, to involve "the depth of your being, of your ultimate concern, of what you take seriously without any reservation" (p 176-7) as the German-US theologian Paul Tillich has said. In Birch and Cobb's case, their grounds for trusting Life are developed within the context of a 'process theology' that is strongly influenced by Hartshorne, Tillich, Wieman and, especially Whitehead. Even so, there are many points in the discussion that might just as easily have been inspired by the very different languages employed in Heidegger's writings or the *Tao Te Ching*:

"Trusting Life is not a passive stance. It is not simply letting Life do its own thing within us. Yet it is sharply opposed to our ordinary images of activity as well. It is the renunciation of control. But that renunciation is itself an acting. To open ourselves to others and to allow challenges to enter into our

experience is a kind of action. To let our defences go and put ourselves in the position to be transformed is a kind of action. To resist the temptation to make of the new synthesis achieved by Life, an end which limits the further working of Life, is a kind of action. The person who is most alive is not passively waiting for something to happen but alertly participating in that happening" (p 186).

The practical upshot of Birch and Cobb's trust in Life is that, in being open to Life, "the human calling is to respond to Life here and now so that life on this planet may be liberated from the forces of death that now threaten it" (p 202). The Zen practitioner, eco-philosopher, and Pulitzer prize-winning poet, Gary Snyder, has expressed this calling in remarkably similar terms: "The real work", says Snyder, is "to check the destruction of the interesting and necessary diversity of life on the planet so that the dance can go on a little better for a little longer" (*The Real Work*, New Directions Books, 1980 p 82). Clearly, from the viewpoint of a planetary concern, it matters little from which direction one draws one's spiritual strength, but greatly that it be drawn.

Expressing their own response to 'the human calling', Birch and Cobb devote their four remaining chapters to the liberation of life in practice. The first of these is addressed to a variety of ethical issues that arise from our increasing ability to biologically manipulate human life. Here the authors' central concerns include the allocation of scarce medical resources, the manipulation of human experience (via electrode implantation, psychosurgery, chemicals, and psychological conditioning—including television), negative and positive eugenics, cloning, and genetic engineering. Many of the controversial questions arising from these issues are directly confronted and positions are argued for on each that are consistent with the ecological model and the ethics implied by it. However, one need not necessarily subscribe to this model to find the authors' treatment of the issues examined both sensitive and sensible.

By contrast, the argument of Birch and Cobb's final three chapters depends very heavily upon one's

openness to an ecological understanding of life—particularly since the authors' conclusions here run at right angles to mainstream social, political and economic thought. These chapters concern not the biological but the economic and political manipulation of human life, and their thrust is to advocate the necessity for a "just and sustainable world"—as Birch has previously done in *Confronting the Future* (Penguin, 1976).

It follows from an ecological understanding of life, the authors argue, that there are limits to the quantity and quality of 'goods and services' provided by the earth:

"The earth is finite in three aspects: it has a limited capacity to produce new resources such as timber, food and water, it has a limited amount of non-renewable resources such as fossil fuels and minerals, and thirdly it has a limited capacity for providing its free services for the maintenance of the life-systems such as its pollution absorption capacity . . . These three limits determine the (earth's) capacity to carry people . . . Yet economic systems the world over operate as though the problems of injustice would be solved by letting everyone, rich and poor, grow in wealth together. To fail to recognise that the carrying capacity of the earth sets limits is to live in a fool's paradise" (p 242, 247).

Living in such a paradise, we daily see Garrett Hardin's *Tragedy of the Commons* being played out upon the global stage: "The history of ecocatastrophes is the history of the human race ignoring limits and replacing sustainable societies with unsustainable ones. The singularity of this generation is that it is doing this on a global scale" (p 243). Birch and Cobb present an impressive array of evidence for this point of view from the distressing abundance which exists, and cogently argue against those who persist in the belief "that industrial society is very much on the right track and that more of the same—continued economic growth—is all that is needed to usher in the technological golden age" (p 253). In contrast, they conclude that "if there is to be ecological sustainability and social justice on this earth there can be no question but that a new social and economic order is required" (p 251). This new order would reject the ideology of unlimited economic

growth, or what other authors have called the 'Cowboy Economy' or the 'Frontier Ethic', which currently dominates the thinking of developing and industrial societies regardless of political complexion. Instead, the aim must be sustainability within an ecological context: "Traditional economic systems that encourage growth aim to maximise the throughput of goods and materials, whereas in a sustainable state it would be minimised" (p 244). Economics (etymologically: management of the household) must be seen as subsidiary to ecology (study of the household).

Beyond this, an ecological model of economic development would emphasize a variety of features that focus on enhancing the richness of experience of humans and other life-forms both present and future. Such a model would preclude by its very nature, however, "the formulation of a static blueprint for a future Utopia" (p 273)—the value of diversity and the fact of change being among the first lessons to be learned from ecology. Against this background, then, the authors conclude by elaborating their ecological model of economic development as it relates to the role of women, energy, agriculture, transportation, and urbanism. In each case, the emphasis is on the mutually dependent goals of social justice and ecological sustainability. The reader who is genuinely persuaded by Birch and Cobb's arguments here will have embarked upon a lifelong exploration of the meaning of the authors' advice that "frugality is no impediment to richness of experience" (p 173). Or in the words of the Norwegian ecophilosopher Arne Naess, one's lifestyle will be "simple in means but rich in goals and values".

In addition to its thoroughness, the thing that sets Birch and Cobb's argument for a just and sustainable society apart from similar arguments or pleas is the re-evaluation of our concepts of life upon which it is based. But this is not to say that one need necessarily be convinced by the conception of life advanced by the authors in order to endorse their preferred vision of society. Indeed, there are at least three major 'thought hurdles' at which one might balk with respect to Birch and

Cobb's re-evaluation of our concepts of life: (i) conceiving of events, not entities, as the primary reality; (ii) conceiving of events as internally related to, or constituted by, their environment (i.e. other events); and (iii) conceiving of events as possessing subjectivity or, in Whitehead's telling phrase, as 'drops of experience'. However for those whose reading of the evidence or whose philosophical inclination serves to carry them over these hurdles, Birch and Cobb's societal vision will follow quite logically. Essentially, this is because their 'liberation' of the ways in which we think about life leads directly to their 'richness of experience' ethic, and from this can be derived most (if not all) of the features that would characterise a just and sustainable society.

In this fashion, *The Liberation of Life* is a compelling and challenging journey 'from the cell to the community' by way of the central problems of our age. In making this passage, Birch and Cobb successfully demonstrate that ecological thinking is not only appropriate at all levels and in all areas but also that it is necessary if we, and the other life-forms to which we are internally related, are to continue to think for much longer. As Lewis Mumford has said: "All thinking worthy of the name must now be ecological".

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## Books

### A poor state to be in

**STATE OF THE WORLD 1984, A Worldwatch Institute Report on Progress Toward a Sustainable Society, by Lester R. Brown and others. W.W. Norton, \$15.95.**

1984 has been a date of ill-omen for as long as most of us can remember. And yet here we are, half-way through it already, and it really seems no worse than any other year in the late 20th century. But a year of such gloomy associations seems a good time to ask the questions, just where do we stand, and should we be optimistic or pessimistic about future prospects for the human race? *State of the World 1984* answers the first question with a level-headed and authoritative array of facts and statistics. As you may have guessed, we're in a mess, and it's getting worse. Pessimism, then, is an understandable response; yet 'the problems we face are of our own making, and thus within our control... Even without any further advances in technology every major problem can be solved, every major human need satisfied.' Only the awareness and the will are lacking: and if this book could be made compulsory reading for leaders and decision-makers everywhere, it would surely provide them with both.

The present volume is intended to be the first of an annual series, one of those hybrid publications which combine the meatiness and depth of a book with something of the topicality of a magazine. As such, it seems to me a wholly admirable aid to the busy amateur who wants to keep abreast of the world environmental crisis. I found that it brought me up to date on a number of problems. In particular, it made me realise just how much the global situation has changed in the last few years. When *The Ecologist* started, way back in 1970, one of its major themes was the impossibility that post-war economic trends could continue much longer. They didn't:

seldom, indeed, can a prophecy have been fulfilled so speedily and completely. The oil price rises of 1973 and 1979 made nonsense of all previous economic thinking: future historians may see them as a turning-point in world history as far-reaching as the Black Death or the fall of the Roman Empire.

Lester Brown explains how the post-war boom was only made possible by oil prices so low that oil could virtually be regarded as 'a free good.' This cheap oil 'pushed back many of the traditional resource constraints on growth'. For example, it made possible vastly increased fertiliser production, which to some extent concealed the growing shortage of farmland. World output of goods and services grew at a rate of five per cent annually for a quarter of a century—long enough for most people, even the 'experts' who should have known better, to start thinking of growth as a permanent feature of economic life. The fact that it isn't does not yet seem to have penetrated the consciousness of many of our politicians, who still talk blithely of 'when the economy gets back to normal', little realising that normal is precisely what the economy has got back to.

The oil crisis is old hat now, of course: everyone knows about it, even if its full implications are taking years to sink in. The fashionable crisis from now on, if this book is anything to go by, will be topsoil. In the USA, the only country where the matter has been seriously studied, over a third of all arable land is losing soil at more than a sustainable rate. And the problem is much the same elsewhere, cutting across all differences of national income and ideology. The estimates quoted—23 billion tons of soil lost each year from the world's three billion or so arable acres—are on a scale which numbs the brain. Try thinking of it as three pounds of soil from every square yard of cropland, all over the world. This alarming wastage was both caused and concealed by agricultural methods based on cheap oil: now, with the ever-rising costs of fuel and fertilisers, the 'quiet-crisis', as Brown describes it, may soon be impossible to ignore. There is clearly no single solution to this problem: but I was interested to learn that up to one-third of US cropland is now farmed under the minimum-tillage system. This, the agricultural equivalent of the no-digging methods advocated by many organic gardeners for decades past, is being adopted by farmers to save fuel, but has the additional (and ultimately far greater) advantage that it conserves soil too.

I have no space to discuss every topic covered by this book; a list of the remaining chapter headings will give some idea of its scope—Stabilising Population, Protecting Forests, Re-

cycling Materials, Reassessing the Economics of Nuclear Power, Developing Renewable Energy, Reconsidering the Automobile's Future, Securing Food Supplies, Reshaping Economic Policies. In each chapter, the statistics and broad general surveys are spiced with the sort of titbits of significant detail which stick in one's mind, to be brought out later to illustrate an argument. In the USA firewood now supplies twice as much energy as nuclear power; manufacturing an aluminium can takes energy equivalent to enough petrol to half-fill the same can; by 1983 twelve European countries had reached equilibrium between births and deaths; South Korea has replanted with trees an area two-thirds that given to rice, the country's staple food crop . . . I could go on and on. *State of the World 1984* is like a hard-cover 250-page issue of *The Ecologist*: it has taught me a lot, and I look forward to seeing what its team of authors have to tell me in 1985.

Nicholas Gould

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## Economics outside the human domain

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FROM THE OUTSIDE LOOKING IN: Experiences in 'Barefoot Economics', Manfred A Max-Neef. Foreword by Leopold Kohr. Dag Hammarskjöld Foundation. 1982.

Manfred Max-Neef is a Chilean economist who was recently awarded the Alternative Nobel Prize. This little book is largely devoted to a description of his work in revitalising the economy—and hence the society—of a small town in Peru, an activity he refers to as "barefoot economics". In essence, Max-Neef's strategy involves working within the informal or 'invisible economy' whose output does not figure in the gross national product, and which, as a result, is of little interest to either politicians or conventional economists.

Max-Neef realises full well that the problems which face us today are very profound. "I am convinced" he writes, "that the total crisis which threatens us, our world and even our biosphere, does not have its 'final cause' (*causa finalis*) in planning faults, nor in the incompleteness of social, political and economic theories, nor in the limitations of one ideology or another. All of these, although not exempt from responsibility, are only 'efficient causes' (*causa efficiens*) of the situation.

The matter goes much deeper. I believe *causa finalis* flows from the very essence of our culture or, in other words, from what one might call 'the original myth' on which our culture has been built."

If our culture gives rise to destructive behaviour, it is because it accentuates man's domination over nature and, unfortunately, this notion underlies conventional economic wisdom.

Economics, like most of those disciplines into which academic knowledge is at present divided, has sought to increase its respectability by aping the methodology of science. In this way it is "mechanistic in the same strong sense in which we generally believe only classical mechanics to be." "This", Max-Neef points out, "is borne out by the works of Jevons (1835-1882) and of Walras (1834-1910)—English and French respectively—who tried to find analogies with classical mechanics. Irving Fisher himself (1867-1947), as all economists know, was involved in an effort worthy of a Swiss watchmaker, when he completed the construction of a particularly ingenious and intricate device, the purpose of which was to demonstrate the purely mechanical nature of consumer behaviour. The Law of Say (1767-1832), which has had such an important influence on liberal economic thinking ('production generates its own purchasing power'), is equally mechanistic. The notion of 'Homo Oeconomicus' is undeniably so and, finally, Marx's diagrams of economic reproduction . . . are bound by the same limitation."

Unfortunately, economists have in recent years become all powerful. As Max-Neef writes; "Their discipline—despite Lord Keynes' warning to the effect that the importance of economic problems *should not be overestimated* with the result that matters of higher and more permanent significance are sacrificed to its supposed necessities—suddenly became the magic science: the one to provide the answers to most of the pressing problems affecting humanity. Its practitioners, newly endowed with this unexpected power to exercise their influence over enterprises, interest groups and governments, swiftly and proudly took for granted their new role as inaccessible and powerful sorcerers. It soon followed that economics, originally the offspring of moral philosophy, lost a good deal of its human dimension, to see it replaced by fancy theories and technical trivialities that are incomprehensible to most and useful to none, except to their authors who sometimes win prizes with them."

Max-Neef talks of his early years as an economist working for a large institution involved in development. "After a number of years, the enthusiasm and optimism with which I had worked as an economist for several international

organisations, gave way to a growing uneasiness. To continue being engaged, whether as a witness or as a direct participant, in efforts to *diagnose poverty, to measure it and to devise indicators* in order to set up a statistical or conceptual threshold beyond which a percentage may reveal the numerical magnitude of those to be classified as the extremely poor: and then to participate in costly seminars and even costlier conferences in order to communicate the findings, interpret the meaning of the findings (my God!!), criticise the methodologies behind the findings, express our deep concern (often during cocktails) for what the findings show, and, finally, end up with recommendations to the effect that what must urgently be done is to allocate more funds for further research into the subject to be discussed again in other meetings—made me feel at a certain point that I was happily participating in a rather obscene ritual."

One of the main problems with the international development agencies is that they are not primarily seeking to solve the problems of the people whose welfare they are supposed to assure, but rather to please their political masters from whom their funds are derived. As Max-Neef writes, "The reigning principle is the same as in a shop: the customer is always right. And the customer, remember, is the government." He goes on to comment: "... to assume goodwill on the part of governments to really improve the lot of the invisible sectors is naive. Most, if not all, have more urgent priorities such as, for instance, building 'damn big dams', as someone once put it. The invisible sectors are treated as expendable sectors. It is assumed that they can wait, and must wait. They will get their turn once the country has become economically strong."

Hence Max-Neef's decision to leave 'suede-shoe economics' (he doesn't use the term) and become a 'barefoot economist'.

Indeed, he is convinced that the 'invisible' economy must be revitalised in order that it can function as independently as possible of both central government (which is invariably indifferent to its fate) and of the formal economy. As he puts it, "If national systems have learned to circumvent the poor, it is the turn of the poor to learn how to circumvent the national systems."

Max-Neef's efforts to revitalise the invisible economy of Tiradentes, a small town in Peru—on a 'barefoot' budget—appears to have been largely successful. He does not regard this as surprising. "So much can be achieved when thinking and acting small," he writes. "After all, *smallness is nothing but immensity on the human scale.*"

Edward Goldsmith

## Revealing Statistics

**ENVIRONMENTALISTS: VANGUARD FOR A NEW SOCIETY,** Lester W. Milbrath, State University of New York Press, (price not given.)

With a title like this, we might expect a fervent warning that we ought to take heed of the modern-day prophets of doom or else suffer the consequences of our ailing civilization's path toward destruction. In fact, although Lester Milbrath notes a comparison between environmentalists and the priests and wise men of primitive societies (both claim the power to foresee impending disaster), he makes an important distinction: in his opinion modern society does not look to the environmentalist as *widely recognised infallible prophets*.

But rather than simply restating the state of the world, or trying to find new heroes, as many others have done at different positions on the scale between pessimism and optimism, Milbrath decided to ask the people themselves. Researchers from Berlin, Bath, and Buffalo formed the International Institute of Environment and Society to embark upon a three-nation comparative study of environmental beliefs and values. A questionnaire was prepared to test public perception of a broad range of environmental topics, with questions ranging from "humans must live in harmony with nature in order to survive. Agree or disagree? (-3 to +3)" to "Is it easy or difficult for you to find a recycling station near your home?" The tabulation and analysis of the results make up the body of the book. Though there are a lot of numbers here, it makes for fairly easy reading, providing an ample supply of statistics to back up its statements.

Studies were conducted in 1980 and 1982, with future investigations planned at regular intervals. Although there is some discrepancy between the techniques and samples used in each country, noticeable patterns already appear between time and place. (These will doubtless take clearer shape with successive surveys):

"Generally, highest levels of trust were accorded to scientists and technologists but environmentalists ran a close second. The public in Germany and England trusted environmentalists more than scientists.

The idea of limits to growth is almost universally accepted in Germany, widely accepted in England, but continues to be highly disputed in the United States. This idea is so contrary to the belief and

behaviour patterns that have dominated public life in America for 200 years that people will steadfastly resist the idea until events force them to recognise it."

Patterns like this can be traced throughout the book with a little effort from the reader. There are statistics to back them up, together with the device that obtained the data, the questionnaire itself. You can try it on your friends, and examine every step of the process. In the end, you must draw your own conclusions.

But Milbrath has not shirked the responsibility of providing a schema to contain all this information. He chooses to represent the various "postures toward the environment" on a two dimensional graph, plotting upon an "advocation of social change" axis and a values axis that opposes material wealth and a safe environment (not an obvious polarity, but supported by the data). Upon this plane he plots the full range of perceptions of the environmental problem, from the rearward—capitalists who still support the dominant social paradigm, to the *vanguard*—environmental reformers who see total reorganisation as the only way out; yes, all prophets please go to the upper lefthand corner. This arrangement shows why the environmental debate diverges from the traditional left-right opposition politics, as echoed by the slogan of Germany's Green Party: "we are neither left nor right, we are in front." Similarly, it shows how socialist and communist reformers can choose to ignore the issue of nature, as they are firmly embedded in the dispute over distribution of material wealth.

Hence this book confirms environmental theory through the opinions of the people, across the spectrum of occupations and beliefs. It is neither pessimistic nor optimistic, but a simple statement of the facts. The final chapter asks the hardest questions, those that would not appear on any questionnaire. "Would we recognise a fundamental change if we were living in the midst of it? ... Assume for a moment that the environmentalists are right and the system cannot be maintained, that we will experience crisis after crisis and eventual breakdown. Can we, then, realistically expect that we will quickly relearn and take corrective actions to extricate ourselves from our predicament? Can we expect that people will be foresighted, optimistic, creative, and cooperative as we struggle to find our way in a crisis situation?"

No easy answers. Statistics show, however, that enough people are ready for suggestions.

David Rothenberg

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## CALL FOR PAPERS

International Conference on ARCTIC WATER POLLUTION RESEARCH:—Applications of Science and Technology, will be held at Yellowknife, Northwest Territories, Canada from 28 April to 1 May 1985. Deadline for submission of abstracts (maximum 250 words) of papers to be considered for presentation is 1 September 1984. For details write to: K. Charbonneau, Conference Services Office, National Research Council of Canada, Ottawa, Ontario K1A 0R6, Canada.

## MISCELLANEOUS

ECOLOGIST BACKNUMBERS from 1970 to December 1977 available free of charge except cost of postage or carriage. Write to: Miss A. Glyn-Jones, 5 Pound Close, Topsham, Exeter, Devon EX3 0ND.

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The Soil Association of South Australia are organising The ADELAIDE FESTIVAL AND CONFERENCE from 1-4 November 1984 in Adelaide, Australia. This year's theme is 'Healthy Food from Healthy Soil'. Write for details to Hon Secretary, Soil Association of South Australia, Inc GPO Box 2497, Adelaide, SA 5001, Australia.

A seminar RURAL DEVELOPMENT AND CONSERVATION—New Approaches, will be held in conjunction with Landscape Research Group from 5-7 November 1984 at the Peak National Park Study Centre. For more information contact Peter Townsend, Principal, Losehill Hall, Castleton, Derbyshire S30 2WB.

## COURSES

VIITTAKIVI INTERNATIONAL CENTRE invites you to the following course:—6 Nov 1984 - 24 May 1985 Winter Course. The courses are held in Finnish and English. Write for details to: Viittakivi International Centre, SF-14700 Hauho, Finland.

The CLIMATIC RESEARCH UNIT at the University of East Anglia is offering a short course on 'Understanding Climate' from 23 April to 29 June 1985. The course will be based in Norwich, U.K., and the closing date for applications is 15 December 1984. Further details from Dr T.M.L. Wigley, Director, Climatic Research Unit, University of East Anglia, Norwich, NR4 7TJ, U.K.

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