

# The New Ecologist

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The Misuse of  
Alternative Energy

Vietnam's Other War

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have False Teeth

Asbestos Pollution

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# Editorial

## The Windscale Inquiry



The Windscale Report is out. "I find it cogent and persuasive," says Peter Shore, Secretary of State for the Environment. "It is unthinkable that we should adopt in this country a policy of reprocessing for nuclear fuels unless we are reassured of the continuing safety of our people. I believe that the Report does reassure us on this paramount issue." Shore obviously reflects a large body of establishment opinion. *The Daily Telegraph*, in its leader, praised the report for its commonsense — for putting nuclear power in perspective. Its only criticism was directed at Shore for having passed the final decision over to Parliament. "This looks too much like a sop to the emotive opponents of the scheme. The issues have been debated fully enough by now."

Few objectors expected Mr. Justice Parker and his assessors, Sir Frederick Warner and Sir Edward Pochin, to turn down the application for the THORP reprocessing plant: that much had become apparent in the closing stages of the Inquiry — and some would say even before it began. But on the basis of the evidence they presented, they expected some limits to be placed on BNFL's plans, particularly with regard to spent fuel being reprocessed for other countries. Instead their case has been peremptorily dismissed. Indeed, Parker seems to have swallowed BNFL's arguments hook, line and sinker: the report positively reeks of its PR. He even indulges in some of the company's renowned red-herrings: plutonium is relatively harmless, he tells us, because one can sit on it if one is wearing a stout pair of jeans. Unfortunately lungs do not wear jeans, stout or otherwise.

Throughout the report, vital questions are begged, expert witnesses from the objectors (never BNFL) are dismissed with disdain, and complicated issues are treated as if they were clear cut. Of Colin Sweet, who testified on the economic costs of reprocessing, he simply says: "I need say no more about his evidence other than that I found it unconvincing." There is no justification given, no argument put forward — he does not even tell us what Sweet's evidence was: it is rejected out of hand. Despite the contentious nature of

much of the scientific data presented, Parker pronounces *ex cathedra* on controversial issues. He accepts, for example, that there is considerable dispute over Dr. Alice Stewart's data on the biological effect of low level radiation, and stresses that the proper place for the debate is 'the forum of science'. He states that "if her conclusion is valid it would seriously affect the whole picture". Yet he then goes on to declare that some of her crucial figures are "clearly wrong" and that he has been able to satisfy himself that "algebraically" the answer she gave under cross-examination was "untenable". Indeed, whenever uncertainty over data arises he consistently finds in favour of BNFL. Energy conservation and the role of alternative energy sources are hardly considered because their contribution is "of necessity uncertain". Yet BNFL's claims regarding the fast breeder programme are taken as gospel — even though no commercial reactor has yet been built. Equally he takes as read that the technical problems of waste disposal, and particularly vitrification, will be overcome. Parker clearly does not think that in cases of doubt the onus of the proof should rest with the instigators of change.

Four years ago, Parker and Sir Frederick Warner reported on the Flixborough disaster. Since then, as Ralph King points out in this issue, grave doubts have been expressed on the conclusions that they reached. Crucial factors appear to have been overlooked, and grey areas turned into black and white — similar failings are now apparent in the Windscale Report.

Enclosed with this issue is our own assessment of the evidence of the Windscale Inquiry which counters Mr. Parker's manifestly biased report. Anyone sifting through the mountain of evidence that had accumulated by the end of the Inquiry, will discover to his astonishment the extent to which Parker's prejudices have coloured his judgements. We cannot accept such cavalier treatment. We demand an independent assessment of the evidence.

Nicholas Hildyard



# ROUND-UP

## *From the Sublime to the Ridiculous*

The sublime nuclear industry has had its share of the ridiculous. Probably nothing will cap the multi-million dollar fire started by a candle at Browns Ferry in Alabama, in which the control system of two giant reactors was completely burnt out. The report in January of the lash-up job at the Hinkley Point number one Advanced Gas Reactor (AGR), in which firehoses were hastily linked to the mains water supply to bypass a shattered pipe, have a certain piquancy. Potentially it was an ugly situation: the pipe's proper function was to carry seawater for cooling carbon dioxide gas in the primary cooling circuit; incongruously too, the same pipe was connected to the emergency back-up cooling systems. Both were therefore knocked out simultaneously.

We hear now — the news having been released more than six months after the event — how Mr. Percy Arlett, the maintenance superintendent of the Hinkley Point AGR, retained his sang-froid during the emergency. 'No-one was hurt, there was no escape of radioactivity and damage to both the fuel and containment vessel was avoided . . . We think the incident shows that the reactor is safer than we would have expected,' was Arlett's blunt comment.

Well, well . . . some years ago, when driving hard along the Massachusetts turnpike, I was rounding a bend when there in front of me was a hefty chunk of wood. A wrench of the steering wheel, but to no avail, we smashed into the block. The car began to reek of petrol and I limped it to the side of the highway where a cautious inspection revealed a severed petrol pipe and a flood of fuel spurting harmlessly over the hot engine. Luck? Or the intrinsic safety of the internal combustion engine?

Clearly it would be folly to take much notice of Mr. Arlett's logic about the safety of the AGR. What is surely revealing is that a basic design fault, using the same pipe for both normal operation and for emergencies, should ever have been allowed. What is the role of the Nuclear Installations Inspectorate (NII) if not to foresee and prevent such fundamental faux-pas? And what might have been the consequences at Hinkley Point if the reactor had been running for years with ageing, highly radioactive fuel in its core, instead of having been newly commissioned? Notwithstanding immediate shutdown, the residual heat build-up from spontaneous radioactive decay becomes

considerable once the reactor fuel has been subject to a long 'burn-up' in the reactor core. Under those circumstances, the one hour and a half to rig up fire hoses may have just been a little too long. And what happens now? Will Mr. Arlett and other AGR maintenance men have to keep the firehoses handy as a back-up of back-up emergency cooling systems? Or will the NII wake from its slumbers and start insisting that the cooling system be wholly re-designed for all AGRs.

Without waiting for a verdict on BNFL's planning application for a thermal oxide reprocessing plant at Windscale, Anthony Wedgewood Benn has now ordered two more AGRs. The estimated cost of the two is £1300 millions, which on original estimates makes them ten times more expensive (neglecting inflation) than the AGRs ordered in the 1960s. Colin Sweet, of the Polytechnic of the South Bank, reckons that the two new AGRs will cost considerably more than the estimates, once delays in construction and capital interest have been taken into account. Inevitably, the AGRs will add to the cost of electricity.

Costs aside, it was surely undemocratic of Benn to have opted for the AGRs. Early on in the Windscale Inquiry, Conningsby Allday, Managing Director of BNFL, voiced his concern over spent oxide fuel (used in AGRs and light water reactors) being kept for periods of more than ten years without reprocessing. Should there be a failure in the fuel cladding, 'then remedial measures on a massive scale would be required in the absence of adjacent reprocessing facilities'.

BNFL and Mr. Wedgewood Benn cannot have it both ways. They cannot on the one hand proceed with nuclear power with the consequent generation of spent fuel, and on the other claim that the long-term storage of such waste without reprocessing may be risky. Was Mr. Allday being deceitful at the Windscale Inquiry in suggesting that there was some risk associated with keeping fuel for long periods without reprocessing? Or did he and Wedgewood Benn know in advance the decision about the new reprocessing plant at Windscale? Indeed the decision to order two more reactors, or any nuclear reactors, before the outcome of the public Inquiry over Windscale was known makes a farce of the whole affair.

Peter Bunyard

## *Sweet Nonsense*

This booklet, produced by the British Sugar Bureau, contains the greatest conglomeration of pseudo-scientific rubbish the present writer has seen for many years, together with all the fallacies known to Aristotle, from the suppression of what is true to the suggestion of what is false. Moreover, it is written in the condescending tone of one patting a small child on the head and saying 'Big Brother knows what is good for you'. Those who composed it obviously had a very low opinion of the I.Q. of the average reader! This production has only one purpose, of course; to increase the sales of white sugar. It is mere propaganda which at times borders on science fiction.

It would need a book to expose all the errors the booklet contains, but here are a few examples of the type of brain-washing to which the reader is subjected.

All through the booklet the word 'sugar' is identified with sucrose, when any O level schoolboy knows that sugar, in Nature, is a rather complex mixture of fructose, glucose, lactose, sucrose and other simple molecules. White sugar is a man-made product which is as synthetic in its own way as the saccharine which has replaced it. Unless we start from this principle we shall never find the correct answer to the various questions proposed in this booklet.

This publication goes on to tell us that sugar (sucrose in this case, remember) has a valuable place in our diet because it is a carbohydrate easily assimilated and enables the body to replace lost energy quickly. It provides more calories at a lower cost than do most other foods. Leaving aside the last statement for the moment, we may comment on the others. The first, dealing with the easy assimilation of white sugar is extremely controversial. The metabolism of white sugar is very difficult when compared with that of the natural sugars or even honey, and the rate of assimilation is not merely lower, but is also accompanied by fermentation in the intestines and the production of a possible severe infection by *E. coli*.

Both the pancreas and the liver have to work overtime to break down white sugar, while they have little or no difficulty in dealing with the natural sugars, which are monosaccharides in a compound form which the human metabolism can deal with easily. If any member of the British Sugar Bureau doubts the

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truth of this he has only to submit to an intravenous drip of Nature's compound on the one hand and dissolved white sugar on the other. If he lives after the second one he will know the difference, and if he does not, at least he will have been a martyr to the cause of white sugar!

The answers in the booklet to the questions concerning obesity could only give rise to ribald laughter if the subject were not so serious. We are told, blandly, that sugar has no special fattening quality and that, in order to lose weight, no particular nutrient should be eliminated from our diet. This is a typical example of the kind of deception repeated time and again in this booklet, and one's first reaction is simply: "Tell that to the marines, or to the fatty next door, who knows perfectly well that it is his sugar intake which is mainly responsible for his condition".

However, to be more scientific, any expert in nutrition knows that there is one fundamental factor in all slimming diets which are harmless to the organism, namely, the elimination of *refined* carbohydrates in all their forms, while at the same

time including in that diet other carbohydrates below the level of the needs of the body. In these circumstances the presence in the food intake of these low-calorie carbohydrates (for example, one small boiled potato) acts as a trigger mechanism. The body needs more than it is getting and so turns on its own resources — the body fat — and consumes it. The statement in the booklet that, in such circumstances, the body will use protein for energy purposes is simply not true. We can, and should, eliminate white sugar in all its forms (jam, puddings, cakes, pastry, canned fruits, sweets etc.) to our own advantage.

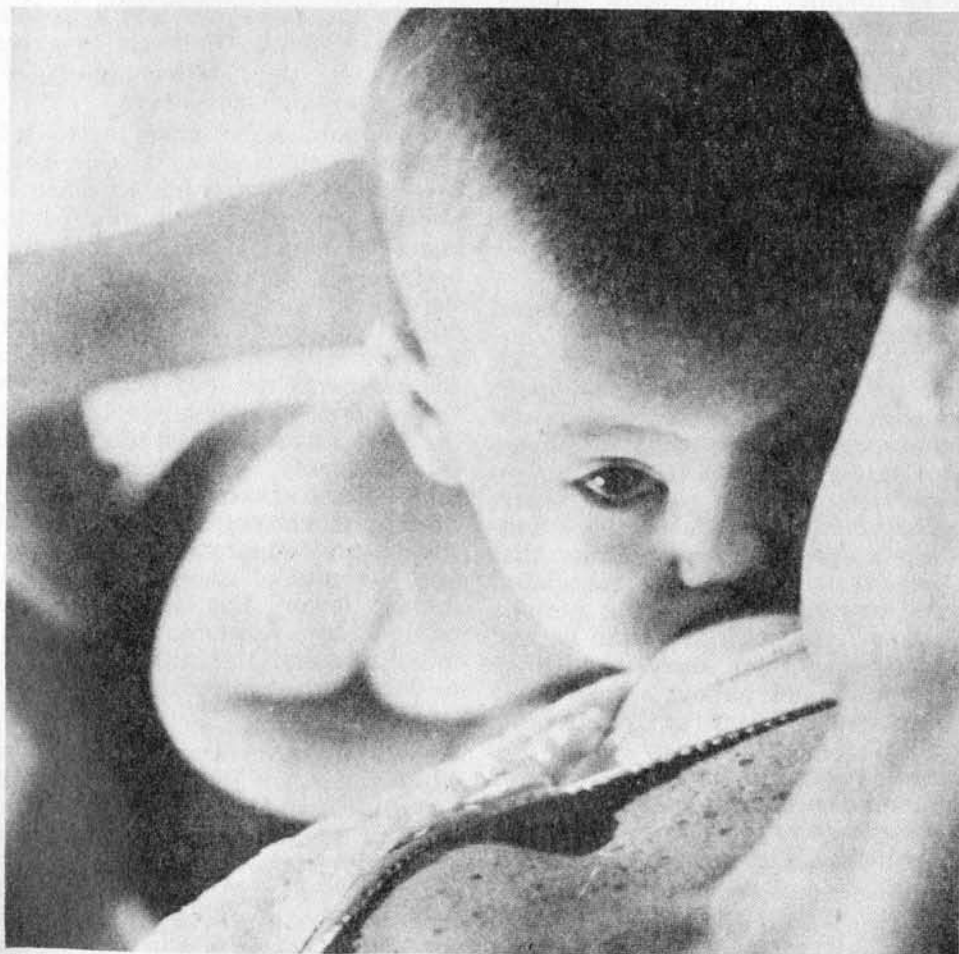
The most blatant error in the booklet is to raise the question of the connection between white sugar and dental caries. It would have been better to keep quiet on this subject, for many reasons. However, one must admit that the Sugar Bureau has done its best to counter the evidence against white sugar by suggesting that other carbohydrates may be involved, and that the risk can be reduced by oral hygiene and fluoride. Some dentists may fall for

the latter, but only very few will agree with the former, because it is now established, without any reasonable doubt, that white sugar is the main, if not the only, cause of dental caries.

It is worth emphasising the fact that this booklet poses questions which were drawn up by the very people who were going to reply to them. This is playing with loaded dice. Things might have been very different if others had been allowed to propose the questions. In that case we would have found included such subjects as the influence of *all* the refined carbohydrates (especially sugar) on *E. coli* infections of the intestines, on periodontal diseases and on the lipid balance in body metabolism.

This publication was conceived from greed for more sales, born in deceit for that reason, and is destined to promote the ill-health of many of the unwary, especially of our children. One can only wish that it had never been born, above all in the light of the principles of preventive medicine.

David L. Greenstock



## Breast feeding—a horrifying dilemma

Questions about the presence of dangerous chemicals in breast milk were first raised in 1951, when DDT was found in the milk of nursing women: nineteen years later, the U.S. based Environmental Defense Fund sponsored newspaper advertisements warning that an ounce of breast milk contained such a high concentration of DDT that it would be illegal to transport it from State to State. Today, the situation is so bad that mothers are increasingly faced with the horrifying dilemma of whether the risks of contaminants in their breast milk outweigh the well-known benefits of breast-feeding their babies.

Writing in *Environmental Action* (vol. 9, no. 15), Deborah Baldwin has catalogued the extent of the problem. 'In a 1975 nationwide survey of 1436 women', she writes, 'the Environmental Protection Agency found a frightening assortment of agricultural and industrial toxins, many of them belonging to a particu-



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larly persistent group of chemicals, the chlorinated hydrocarbons. Dieldrin a potent carcinogenic pesticide appeared in the milk samples at levels seven times higher than those recommended by the World Health Organisation as an 'acceptable daily intake' for adults. The average levels of PCBs was ten times higher than the maximum level recommended for infants by the Food and Drug Administration. The EPA reported that 99 per cent of all American women have detectable levels of PCBs in their breast milk, and, warns the EDF, nursing infants are exposed to almost 100 times the amount ingested by adults on a body-weight basis.

Recent research by Dr. Patrick O'Keefe, of Harvard's Department of Chemistry, has revealed the presence of dioxin in samples of breast milk taken from the North West United States, where the herbicide 2,4,5-T has been widely used. The latter has been shown to be toxic at extremely low levels: Dr. James Allen, a pathologist at the University of Wisconsin, reports that with diets containing as little as 500 parts per trillion, primates experienced loss of blood cells and 'more than a 50 per cent mortality' due to haemorrhaging.

'There are toxins everywhere', says Stephanie Harris, whose book, *Birthright Denied: the Risks and Benefits of Breastfeeding* came out last June\*. 'They are unavoidable . . . Cows lactate constantly, so there's a continual recycling of environmental contaminants. Women on the other hand lactate only once or twice in a lifetime.' The problem of breast milk contamination is compounded by the fact that many chemicals, including PCBs, travel through the placenta and affect the health of the foetus.

Diet can play a significant role in reducing the intake of common pesticides and toxins: the EPA, for example, found that levels of pesticides among vegetarian women were as low as one-third to one-half the national level. Even so, the dangers of contamination do not disappear: the risk of breast cancer for the mother, or cancer for the child are still present. 'Under normal circumstances,' says Stephanie Harris, 'We would certainly recommend breast feeding. But these are not normal days.' There could be no more searing indictment of modern society.

\*Available from: The Environmental Defense Fund. 1525 18th St. N.W. Washington DC 20036. USA. Price \$1.50

## Floundering in a dirty sea

The breakdown of the Monaco Conference on the future of the Mediterranean, emphasises the difficulty of getting significant international co-operation on environmental matters. So long as the nations involved are committed to the idea of perpetual growth, the problems of pollution will not be capable of realistic solution.

At the Barcelona Conferences of 1975 and 1976 (Barcelona 1 & 2) the Mediterranean Action Plan was approved. Sixteen of the coastal states attended either one or both of the meetings and signed agreements and protocols. In February this year three of these protocols became international law when they were ratified by Spain, Tunisia, Monaco, Malta, Lebanon, France and Yugoslavia. One commits Mediterranean countries to protecting the sea from pollution; another outlaws the dumping of dangerous pollutants from land sources, shipping and aircraft while a third deals with co-operation in combating massive oil spills in the sea.

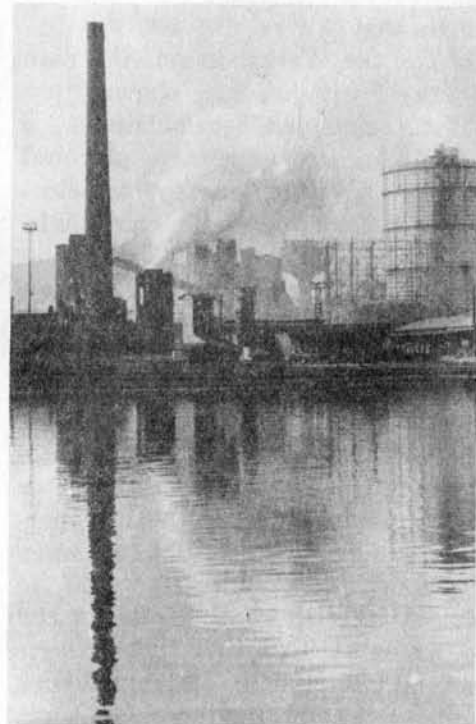
Hopes were high that at Monaco in January this year, progress would be made towards agreeing further protocols dealing with the clearing up of existing pollution, off shore oil drilling, and the sharing of the economic burden of realising the Mediterranean Action Plan. None of the Mediterranean countries doubt the need for action; there is no disagreement on the facts nor is there any lack of environmental conscience — only Syria did not approve the Barcelona Convention — so what went wrong?

It has been widely reported that the conference foundered on the old rocks of discord and divergence of interest between the rich states of the northern Mediterranean and the poor states of the south — between the developed and developing nations. But the real disease, of which these are only the symptoms, is the dedication of all the countries to the ideal of continued industrial and economic growth. The proposition is enshrined in the curiously named Blue Plan, which far from being a plan is simply a research and advisory body. Thus it is committed to the totally contradictory proposition that the clean up of this historic sea must be achieved *within the framework of economic and social growth*.

When the developing nations of the Southern coastline expressed suspicion of all controls that might prejudice their long term plans for

industrial development, a predictable stance of sympathy and tolerance was automatically assumed; no one stood up and told them that this way lies their certain ruin. When they complained that, since their seas are less polluted than those of France, Spain and Italy, it is unreasonable to expect them to conform to the same rules, they were assured that they could go on industrialising at least until their dirty water reaches the same measure of pollution as the 'acceptable' levels laid down for the whole sea. (At present much exceeded by the industrially developed countries.) The rich countries, meanwhile, although agreeing to the long term proposals in principle, flatly refused to accept the share of the financial burden proposed in UNEP's document on the economics of converting plans into actions.

The Mediterranean dilemma reflects the global situation that has been discussed in *The Ecologist* over the last seven years. Certainly more countries are now aware of the dangers of environmental degradation; certainly more people become involved, every day and every week and every month in the battle against pollution and its attendant ills; certainly greater international co-operation is being achieved than might have seemed possible some years ago — but the tragedy is that so long as national governments remain committed to the growth ethic, all this effort represents only the icing without the cake.



# The Wrong Alternatives

Renewable energy sources have certainly captured the imagination. Governments in Europe, the United States, Japan and elsewhere have been channelling more funds into their development. At the same time those seeking alternative lifestyles see in the whole range of non-fossil, non-nuclear energy, the answer to their ideological belief in the magic trio of renewability, recyclability and of keeping the earth's ecology intact.

It is doubtful whether any energy source, conventional or otherwise, will be available to power industrial society in the near future. But even if we have abundant energy, society's problems will not be solved. It is not the quantity of energy available but the use we make of it that matters.

Alternative energy will not stop industrial pollution, land dereliction or social disintegration: swapping one power source for another without restructuring industrial society will solve nothing.

Alternative energy clearly has an important role now and in the future; but to ask whether the sun, the wind and the waves can replace all the energy currently supplied by fossil fuels is to pose the wrong question. We must ask instead how these resources can be most effectively used to facilitate the changeover from an industrial to a post-industrial society.

Andrew MacKillop and Peter Bunyard here examine two of these alternatives.

## A Tsunami of Wave Power by Andrew MacKillop

When it comes to rediscovering old research ideas — abandoned in the past for important, as well as trivial, reasons — and steadfastly ignoring real opportunities for deploying effective and proven policies and technologies, our energy mandarins appear to be as happy as the waves are eternal. This does not mean that waves are not energy-rich: as the Workshop on Alternate Energy Strategies has shown from "first principles" calculations, a 10-20 kilometre long wave powered float, converting energy to electricity at 33 per cent efficiency might yield 1000 MW<sup>1</sup>. While this is no more intrinsically impressive than the fact that an average suburban roof intercepts around 100,000 kWh of direct solar energy per year, the magnitude, novelty and regional connotations of wave power have triggered a band-waggon that now looks unstoppable. Other advantages can easily be trotted out: wave energy is renewable; it would be converted offshore, thus offering the slim chance that the multi-billions poured into offshore oil technologies will not become rusting scrap when

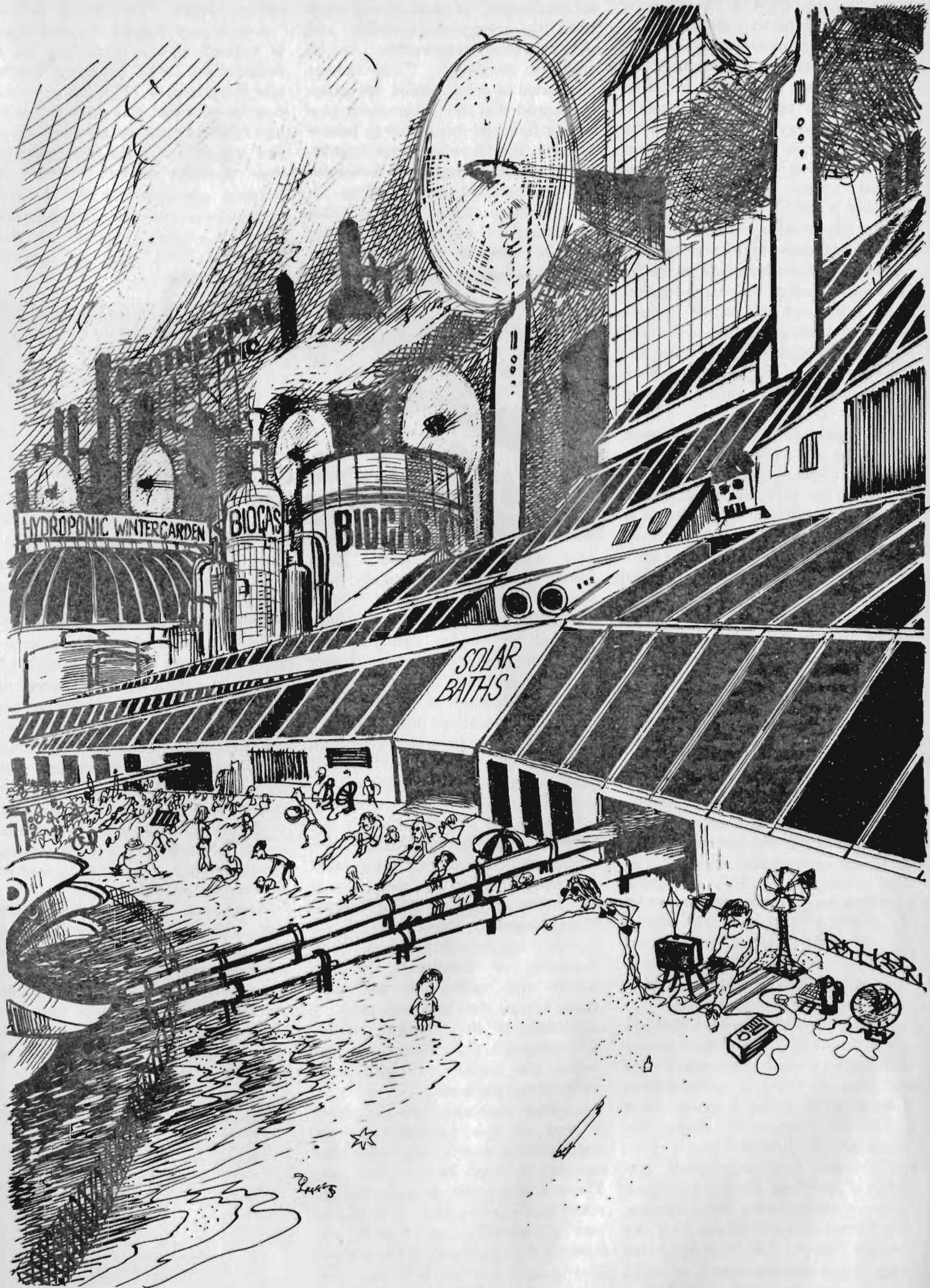
the North Sea oil and gas bubbles finally collapse; wave energy has greatest potential along the Western Islands chain, where population is low, and the few votes at risk can be ignored; the upper limits on wave energy development are very high; it would give most output in winter, when energy demand is greatest; the technology involved would be large scale, complex and capital intensive — and thus could only be attempted by established power engineering corporations; and last but not least it would be Britain's very own piece of "technological sovereignty" in the renewable energy business.

So it is that in just three years wave energy has come up from nowhere to capture the second-biggest slice of the Department of Energy's very slim research and development funding in renewable energy sources. In 1977 the Department announced that it would receive £2½ million funding for a Research and Development programme of about 2½ years,<sup>2</sup> second only to the funding for solar energy, (which is £6 million spread over four years) and vastly greater than all other

funding to the renewable energy sources. Layers of credibility have been added to the concept of wave energy — which has yet to run a string of fairy lights, let alone a power station — by sombre pronouncements from Government sources of its gigantic possibilities. For example Dr. J.K. Dawson, Head of the Government's "energy think tank", the Energy Technology Support Unit (ETSU), had this to say about it: "The amount of energy available is impressive. If one assumes conservatively an extraction efficiency of 25 per cent, about half the present UK requirement for electricity might be met in installations extending about 600 miles if the most favoured sites were used".<sup>3</sup>

Dr. Dawson's conversion efficiency figure might be "conservative" — and no one can argue this technological point when no single wave machine bigger than Edinburgh University's Stephen Salter "duck" prototype (a few hundred watts) has been built — the glibly dealt figure of 600 miles of such machines is surely anything but "conservative". In his statements on





"Come here this instant, or the Wave Power Generators will get you."

wave energy ETSU's Dr. Dawson has been careful to introduce some grounds for plausible denial, along with the euphoria. As he puts it: "It is by no means clear what would be the optimum method for transmitting the energy ashore",<sup>4</sup> and he underlines this by further admitting that even the *form* of transmitted energy — for example whether it will be electricity, hydrogen, compressed air, or maybe ready packed hot-water bottles for granny — is under question. And while he is able to report on the many Government agencies and research groups active in this apparently-new technology, he also adds that: "some 350 wave power devices have been patented in the UK during the past 100 years".<sup>5</sup>

My argument is that the greatest advantage of wave power to our Government-business energy mandarins is the fact that no tiresome and "old-fashioned" examples of it exist — and thus an unrestrained fantasy vision of a wholly "new" billion pound high technology energy business can be erected. This Promethean vision fits so much better into the official vision of the future than all the other renewable energy sources — it allows for *more* centralisation, *bigger* cities, more of everything. No tiresome questions of how smaller scale and more decentralised energy sources can be tacked onto or conversely, change our large scale centralised society need be asked of wave power. Even more important, the technology can be scaled upward and upward — at least in theory — which when added to ETSU's *incredible* forecasts for the growth of British nuclear power, as in their "Linear Reference Scenario" for the Department of Energy,<sup>6</sup> implies at least a *tripling* of electricity generation by 2025.

It is no wonder, therefore, that the most unrestrained advocates of the plutonium economy have taken time out from sneering at conservation and renewable energy to praise wave power. For example W. Miller, the Chairman of Britain's most pro-nuclear area electricity board, the South of Scotland Electricity Board — in his paper to the Royal Institution Forum *Nuclear Power and the Energy Future*,<sup>7</sup> had time to glowingly detail the massive potentials and "engineering and environmen-

tal challenges" of wave power while belittling energy conservation and the non-wave renewables. As he said, on insulation: "The fervent advocates of conservation are quick to suggest that the Government give strong financial incentives to householders. But there are more important demands on the money available, for the national good". Thus he could dispose of the "fervent" idea that using *less* energy might be any kind of national energy solution.



*It is no wonder that the most unrestrained advocates of the plutonium economy have taken time out from sneering at conservation and renewable energy to praise wave power!*

And while saying that "Solar panels . . . would certainly save some energy", he added "Solar energy is not expected to reduce demand for energy sufficiently to make an impact on the energy resources problem". The fervency of his own advocacy of wave power, which took up about one-half of his paper, is laughable when we realise that *no* wave power devices yet exist, while insulation, solar power, and wind power — all of which he just dismissed in a few lines — are proven, available immediately and much cheaper than nuclear power! One conclusion we can make is that the vision of vast concrete booms, strung together like chains of up-turned supertankers, and with hundreds of thousands of grid pylons and cables slashing from them across the Western Isles, is appealing to the "mega builder-technologist" that lurks so close below the surface of our energy officials and planners.

Another conclusion we can draw is that all this euphoric fantasy about wave power is only acceptable because of North Sea oil and gas. These will provide at least twenty years supply of energy, even at the vast production rates that are forecast for the early 1980s, and so they permit energy fantasies that supposedly "mature" in around

twenty years. The rationale of "more energy is good — much more is better" took a pounding as a result of the OPEC price and blockade measures of 1973, but we can now be sure that it is alive and well and fully returned to power. Only a few things can shake this massive and wasteful conceit, with its outright contempt for the natural environment, greater self-reliance (through energy saving) at the household level, and the age-old

traditions and natural beauty of the Western Isles. They include a sharper downturn in the world economy, which is increasingly likely as our trade partners suffer intensifications of the post-OPEC recession, because they have no fortuitous North Sea energy to use as insulation from reality. Also, there is at least a chance that either a more oil-conserving regime will gain power in Westminster (though we must admit this is most unlikely), or that the SNP — with its commitment, at least in 1975,<sup>8</sup> to conserving North Sea oil — will gain power in an independent Edinburgh.

At present, however, we are stuck with a Department of Energy than can smugly proclaim that its love affair with wave power is "rational", because it fits the future we are told we must have. With little hope for rapid changes of research priority, it appears that we will just have to roll with the tide, or waves.

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8. How Much Oil? SNP, August 1975.



# The Coal Equivalent Mentality by Peter Bunyard

Britain, Europe, Asia, the Middle East, Japan and Australia — practically every country under the sun now has meetings and exhibitions on solar energy. Clearly the sun is finding its way back into our consciousness as something more than a tanning agent for millions of tourists. But does the sun really have a future in an energy-hungry society? Or is it little more than an esoteric power source for those who can afford to buy their energy independence with the installation of avant-garde gadgetry?

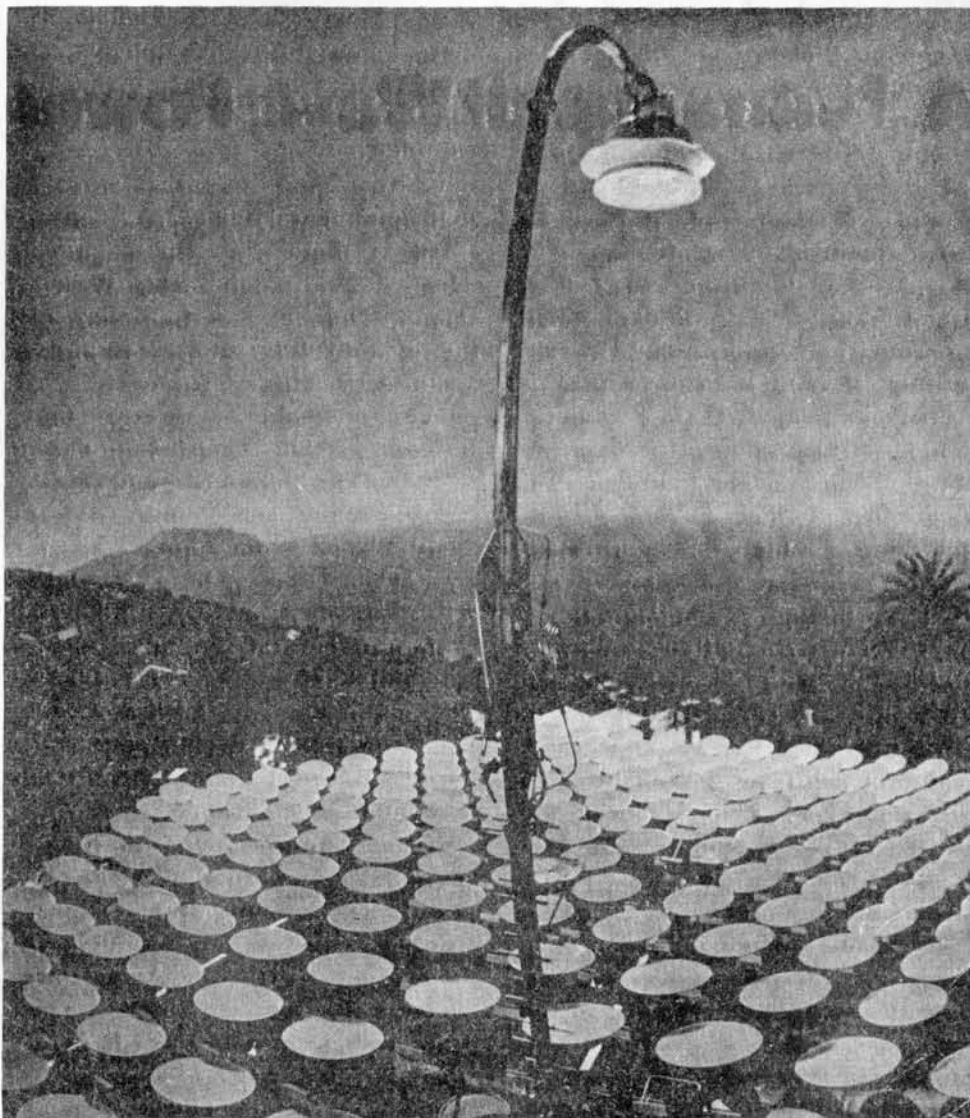
Equating good with solar energy and bad with nuclear power has indeed become fashionable among conservationists as well as scientists, members of parliament and the occasional energy planner. Increasingly incredible ideas are being bandied about which claim that alternatives will salvage industrial society: we hear of solar farms in the desert, tens of thousands of giant windmills straggling the hill-tops, energy plantations, huge constructions out at sea for capturing wave-power and solar satellites fifty kilometres across, which beam the sun's energy in microwave form down to the earth.

With solar power plants giving a five times better return on energy invested than nuclear ones, it is not necessarily the technology that is wrong, but the scale and intention of present government programmes. France, for example, is a leader in solar energy, having had a solar power furnace working at Montlouis in the Pyrenees since the late 1940s, and one, on a somewhat grander scale, at nearby Odeillo since the late 1960s. In fact the Odeillo plant has been pushing up to 64 kilowatts of electricity into the French national grid since November 1976, which makes it a first of its kind. The electricity board of France, L'EDF, now has plans to build THEM I, a solar power plant of 3.5 megawatts, to be completed by 1980. After that it will construct a 10 megawatt solar plant. What is indicative is the land area required

for a relatively tiny plant. The biggest solar plants conceived of today will be more than a hundred times smaller in generating capacity than a 1000 megawatt nuclear plant. Yet they will take up 40 times more space (though it should be said that, once built, they need no infrastructure to supply energy: nuclear power plants, on the other hand, need uranium mines, transport systems, reprocessing plants, fuel fabrication and waste disposal sites.) Each Frenchman, should he live in the sunny South, would need something like 50 square metres of collecting mirrors to provide him with his present electricity supply, and to furnish 10 per cent of France's electricity would mean 1200 solar

power plants, each with a 10 megawatt generating capacity, covering an area of land not less than 300 square kilometres. It surely stretches credulity to suppose that the French government will bring such a programme into being. Much more likely, it will put almost all its eggs into the nuclear power basket, with a few undersized ones dedicated to a handful of solar power plants integrated into the southern landscape.

In the United States something of a debate has been going on among scientists as to what might be the optimum size of such plants. Two Princeton physicists, Robert Williams and Frank Von Hippel, declare that a solar power plant



Solar Power Station outside Turin.

much over 10 MW(e) would take on preposterous, unworkable proportions, while Professors Alvin Hildebrandt and Lorin Vant-Hull believe that solar power plants capable of generating 200 MW(e) are all in the realm of the possible. Nor do they have any qualms about the dimensions of a big solar plant: a 100 MW(e) plant would need a tower 260 metres high faced by a field of some 20,000 heliostats each 6.4 metres by 6.4 metres, spread over an area of about 3.5 square kilometres. Just what a 200 MW(e) plant would require in heliostats and land hardly bears thinking about.

For Britain, solar power is obviously not a viable option, far more likely, as Sir Martin Ryle suggests, it would have to opt for wind or wave power. All that is needed, says Sir Martin, are several hundred miles of wave machines and some 10,000 windmill sites, each machine having blades 40 metres long.

To be fair to Sir Martin, he was proposing that we had no need for nuclear power: renewable energy resources could do the job. The trouble with all these schemes is that they will never, ever get off the ground, for the simple reason that they depend on centralised agencies, like the CEGB, to put them into practice. For the CEGB the idea is too banal, ironically because it is so radical. Imagine it having to tell its employees to cast off their radiation gear, stop designing nuclear power stations and instead start erecting windmills. Indeed it is not the government-backed organisations which so far have come up with the goods. It is resourceful private individuals. Sir Henry Lawson-Tancred, for example, with the help of the local blacksmith, has erected a handsome 30 kw windmachine at Aldborough in North Yorkshire, and in Denmark the Tvind colleges have put up a windmachine capable of generating 2 MW. Both Sir Henry's windmachine and that of the Tvind colleges are pushing some electricity into their respective central grid systems, and the danger is that such initiatives will fall between two stools: on the one hand, they will fail to serve the communities where they are built, and on the other they will make a negligible con-

tribution to the centralised power supply.

Here, perhaps, is the nub of the problem. In all these schemes, what we are seeing is the outcome of measuring all potential energy resources in terms of a common single unit like coal-equivalents. Everything is added up — in coal-equivalents — to see if it meets requirements, and when it does, it is greeted with a sigh of relief from the planners and a nice cheque from the Treasury for funding research and development. In fact the coal-equivalent mentality demands that the energy replacement, whether sun, wind, wave, water or indeed nuclear power, takes over all the functions of previous energy forms. Even though governments are setting up schemes to combat more obvious energy wastage, like Wedgewood Benn's proposal to insulate all Britain's council houses, their main concern is to assure energy supplies to meet projected demands for the end of the century and beyond. Instead of looking at the renewable energy sources to hand to see how society can best adapt to their use, the establishment views alternatives only with an eye to their keeping industrial society going.

It is very important that we clarify what we want from energy. Trying, as we do now, to squeeze renewable energy resources into the industrial strait-jacket is full of pitfalls. First, should renewable energy resources be seen to fail, then nothing, not even the most fervent environmental considerations, will prevent the scramble for nuclear power. Second, if they succeed, their promotion in the industrial cause will be nothing less than a carte-blanche for industrial society to proceed in the general direction in which it is going. It is surely hypocrisy to acclaim renewable energy resources as somehow superior to fossil fuels and nuclear power on moral grounds because they do not of themselves pollute to anything like the same extent, while at the same time advocating their use in an industrial society. It is not the energy which pollutes but the ends to which it is put.

To suggest that renewable energy resources could ever power the industrial society is exceedingly

questionable, even with full government backing. Can we expect such energy forms to run our big steel industries, our chemical plants, to fuel our cars and aircraft and to provide us with electricity for all our household gadgets? It is a tall order. In such a society, we will not be able to tolerate windless days, calm seas or clouded skies, the scale of our requirements will be too great. And even though the quantity of renewable energy coursing across the earth each year amounts to thousands of times more than we presently consume in all our industrial under-takings, when it comes to the actual collection of energy we find an enormous discrepancy between theory and practice. Thus the notion of having fuel for our cars, trucks, farm vehicles and aircraft looks rather ludicrous in the light of real figures. For example, according to R. Morse of CSIRO, just to provide one half of Australia's transport needs, in the year 2000, necessitates chopping down 13 million hectares of timber each year and converting it into liquid fuels. The double of that, 26 million hectares, is an area the size of Britain. Just how Britain could manufacture its own biomass fuels is beyond comprehension.

It is surely an inescapable fact that renewable energy resources make little sense when pitched into the roaring furnaces of industrial society. They will only really serve us when they are applied to the needs of reasonable sized communities, whether farms, villages or coherent urban areas.

The danger is that only the affluent will be able to afford energy independence. Certainly the concept of the zero-energy house with its sophisticated storage facilities, heat pumps, computerized control, heat exchangers, triple glazing, nth degree insulation, its windmachine and flat-plate collectors is somewhat offputting for those of meagre means. Indeed to live in a home where the doors and windows can never be left open, and in which the design of the house has become wholly subservient to limiting energy consumption to the barest minimum would be anathema to most of us. We might as well live in insulated boxes.



# Superior Pollution

## Asbestos in the Great Lakes

by  
James Harding

**Attempts to stop asbestos pollution in Lake Superior have been continually frustrated. By juggling with technical data government scientists have obscured the wider implications, and have justified inaction. Vested interests will continue to out-manoeuvre local objections until a unified policy is implemented.**

Just as we start to become aware of the collective health dangers of a particular environmental toxin, we are confronted with another toxin and another danger. Always in search of a sensational issue, the media latch onto one environmental issue, deal with it dramatically and superficially, and move on to another. There is the very real possibility that this society will consume environmental crises the way it consumes resources.

The best antidote we have to this fragmentation and withering of environmental consciousness is a perspective which grasps the societal and environmental forces that are at play within any one issue. Any environmental issue is only a *single* issue if we analyze it out of its actual societal and environmental context.

I want to show the advantage of such a structural and historical handling of environmental issues by discussing the health hazards of asbestos in drinking water. A year ago this issue received a great deal of attention in the local media and a short-lived community group, People To Clean Up Lake Superior, was organized to protect the population. Today we hardly hear about the possible health danger, and though both levels of government, under public pressure, have said they will speed up the construction of a filtration plant, asbestos continues to go into Lake Superior.

### Selling and Dumping Asbestos

The major use of asbestos today is in the construction industry. In the U.S. alone in 1972, 338,400 tons of asbestos was used in the manufacturing of siding, shingles and pipe for construction purposes. Tiles, paper, brake linings, clutch facings, gaskets, packing cases, insulations, textiles and felts brought the U.S. total to nearly 800,000 tons.

The increase in the use of asbestos on a worldwide scale is even more astonishing. In 1953 there was almost no asbestos-cement pipe in use. By 1960 there was 600,000 miles of such pipe in use and by 1972 the total had risen to 1,500,000 miles.

The attractiveness of this material is its tensile strength, light weight, lack of corrosiveness, fire and heat resistance, and smooth finish which, in the case of pipe, lowers the resistance to pumping. *But the very things that were good for industry have proven to be harmful to our bodies.* The sickness, cancer and suffering of thousands of asbestos workers is finally being documented and exposed. So, too, is the complicity of many industry-paid researchers in trying to cover up the health risk to asbestos miners, insulation workers

and the families of workers in the industry.

This belated recognition of the health hazards of asbestos, can never undo the industrial genocide that has already occurred. Perhaps, though, it can teach us some necessary foresight about other environmental health controversies. For example, the danger of asbestos to people not directly employed in the industry is not yet generally acknowledged. The use of asbestos as a panacea in the construction and automobile industry means that every person in North America is now in contact with the cancer-producing substance.

Even if officials were correct in saying that there is not a serious health danger from the widespread use of asbestos, what about the fibres that have been dumped into the natural environment as "waste"? We can get a picture of the extent of this pollution if we look at dumping by Reserve Mining, which has a large taconite processing plant on the shore of Lake Superior at Silver Bay, Minnesota.

Reserve Mining, a subsidiary of Arco and Republic Steel, has been operating its plant since 1955. Over the last twenty years, it has been dumping 67,000 tons of taconite tailings into the lake every day. A large proportion of these tailings, which include a form of asbestos called cummingtonite amphibole, sinks to the bottom of the lake. By 1973, after eighteen years of this mindless dumping, the result is a sediment bed which stretches twelve miles out and fifty miles along the lake shoreline.

It is frightening that industry has been allowed to pollute Superior at this rate, unchecked. But we have told only part of the story. It has been estimated that 20,000 tons of the tailings dumped each day actually remain suspended. Because of the miniscule size of asbestos fibres, there is a tendency for many of them to be carried into outlying areas of Superior by strong currents. Thus, what started as a tragic pollution of a huge bay has become the degradation of a massive fresh water lake.

Attempts by progressive governmental officials and environmentalists to shut down Reserve Mining have continually been frustrated. As early as January, 1969, the U.S. Department of the Interior recommended that Reserve not be allowed to discharge taconite waste for more than three more years. In that year there was conclusive proof that the wastes from Reserve were harming the lake organisms necessary for fish life. In 1970, however, Reserve was given a conditional three-year revalidation of its dumping permit.

## Political "Science"

To pretend that there is an absolute difference between science and politics, and simply appeal to the "experts", actually *decreases* the objectivity of any particular analysis. This was shown very clearly by the role of the Ontario Ministry of the Environment (OME) during the asbestos controversy in Thunder Bay. Their role, in a nutshell, was to try to obscure the debate over possible health hazards of drinking asbestos through a technical debate over numbers and methods. And their handling of the numbers game was itself questionable.

It was technical work that actually precipitated the Thunder Bay controversy. A water sample taken by Dean Ross of Lakehead University in February, 1975 and another one taken by researchers from McMaster University in 1974 suggested that there were 14 and 20 million asbestos fibres per litre in the tap and lake water respectively. When these studies got publicity, the Ministry responded by referring to its own most recent sample, taken in April 1975, which showed a much smaller asbestos count of 87,000 fibres per litre.

The questions have to be separated to gain any clarity in this dispute over numbers. On the one hand there was the dispute over the total amount of asbestos in the Thunder Bay water. On the other hand there was the dispute over the source of the fibres. On both counts Ministry officials played an unprincipled role. Not only did they refuse to take the Lakehead and McMaster figures seriously, they also tried to discount that the source of much of the asbestos was the Reserve Mining plant across the border. One Ontario official stated on a local television station that "none" of the amphibole fibres that come from Reserve Mining were in the local water. The Ministry regional representative was quoted as saying that only seven of these fibres had been found in the OME tests.

The environment official may have been right in saying that the Ministry had not located many amphibole fibres, but he was not telling the whole story. The 1975 International Joint Commission (IJC) Report shows that as far back as October 24, 1973 there were 2.1 million amphibole fibres in a litre of water taken off Thunder Bay. The Ministry Regional representative was quite aware of these figures, for he referred to them in writing at a Thunder Bay City Council meeting several months before the asbestos controversy began.

The Ministry officials were also unprincipled on the question of the total amount of asbestos in the water. The same IJC Report indicated that the average for all samples taken prior to July 1, 1974 was .54 million amphibole fibres in a litre of Thunder Bay lake water. Even this average was much higher than the 87,000 fibres reported for the April, 1975 sample. Yet officials continually tried to leave the public impression that very few samples had been taken, certainly not enough to say anything definite.

## Tricky Statistics

The Ministry tried yet another strategy to undermine the credibility of the dangerously high asbestos levels found in the Lakehead and McMaster studies. In co-operation with the Thunder Bay City Council and the Medical Officer of Health, the Ministry flew in a senior civil servant from Toronto. On September 25, 1975 the City Council held what they called an "informative session" with Dr. G. J. Stopps, Senior Health Consultant for the Ministry.

At that evening session Dr. Stopps talked off the cuff about

how we all had to take risks each time we went out on the street, and how there was no proof that drinking asbestos presented a health hazard. His reassuring and seemingly authoritative comments had the intended effect, for the next morning the headline in the Chronicle Journal was "Gov't MD Sees No Sign of Asbestos Danger." The position taken by Dr. Stopps was that since Thunder Bay's rate of gastrointestinal cancer was not higher than the Ontario rate, there was nothing to worry about. The fact that his figures only went up to 1970 should have been reason enough to suspect his conclusions, especially since asbestos-related illnesses have been shown to have a long latency period. But the very idea that you can definitely state there is no possible relationship, with only a general comparison of two average populations, is totally erroneous. This statistical trick has been used over and over again by industrial researchers to obscure occupational health hazards.

Dr. Stopps referred to one such erroneous industrial study to substantiate his own argument. That study, done at McGill University in 1971, examined 11,000 Quebec asbestos workers and concluded that the mortality rate of this group was not very different from that of the total Quebec population. Though this may have been true, as it may be true that Thunder Bay has no more gastro-intestinal tract cancer than Ontario as a whole, it is also true that asbestos can remain latent for twenty-forty years. And epidemiological studies done by Dr. Irving Selikoff show a definite relation between airborne asbestos and lung cancer in people who have worked with asbestos for many years.

Before he came to the Ontario government in 1971, Dr. Stopps was assistant director of Dupont's Haskel laboratory in Delaware, where he downplayed the health hazards of lead additives in gasoline. In the Ministry of Health he continually minimized the health danger of methyl mercury in the English-Wabigoon river system in northwest Ontario. What is especially shocking is that after playing his questionable role on mercury issue, Dr. Stopps became a Professor of Preventive Medicine at the University of Toronto.

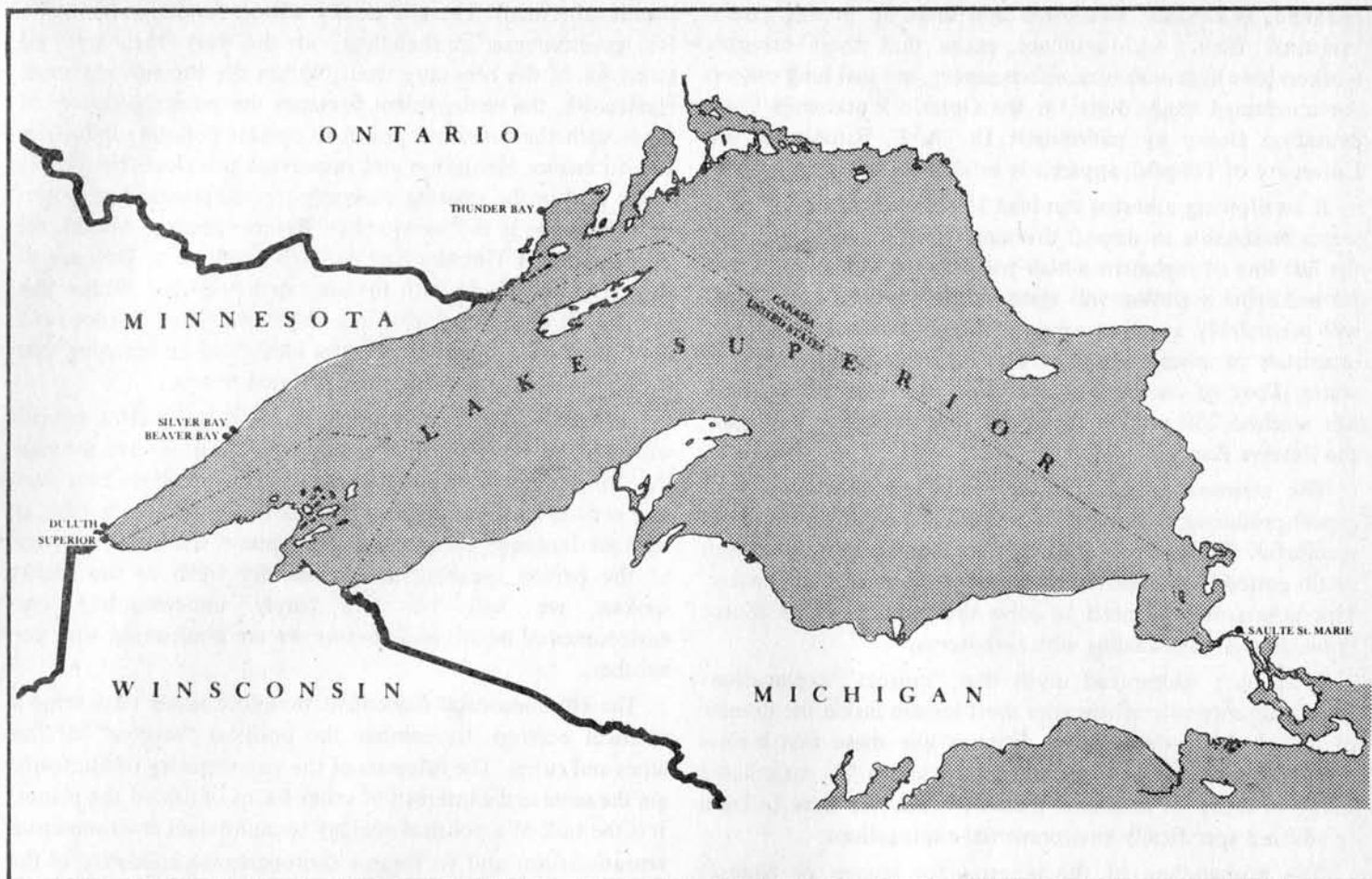
## Bad Smells and Wrong Priorities

The Thunder Bay City Council seemed not to be interested in factual information either. But polluters tend to stick together, and the Corporation of Thunder Bay is one of the greatest polluters of Superior. While present and past mayors have talked glibly about the great northern environment, the sports paradise of Ontario, they have also allowed Thunder Bay sewage to go directly into the lake, mostly untreated.

Thunder Bay is the only major city on Superior without full primary sewage treatment. Most have secondary treatment. Ironically, the asbestos controversy began to make local people aware of the city's role in the pollution of Superior and of local drinking water. In response to growing public pressure the city finally announced that it would expand its primary sewage system. But the proposed additions would still only be 50 per cent effective with solid waste matter.

The city had higher priorities than safeguarding the health of local residents. Council was more interested in a proposed airport expansion to ensure the growth of Thunder Bay as the commercial hub of the northwest resource hinterland. Airport travel (seventy per cent of which is for business transactions) and not complete sewage treatment (which directly affects the population as a whole) was the city's clear concern.





The response of the city to the potential hazard presented by asbestos and other pollutants was continually cosmetic. Residents had been complaining of bad tastes and smells in the drinking water long before the asbestos issue was even raised. And city officials knew about the condition of the drinking water resulting from their own untreated sewage and nearby industrial pollution.

Back in January 1973 the city engineer had written that the "water quality at Bare Point Intake (on Lake Superior) has been found to exceed Ministry permissible water supply criteria with respect to bacterial counts and phenol . . ." The source of the phenol, which comes from distilled coal tar and is very toxic, was an Abitibi pulp and paper mill which dumps its wastes not far from the intake for Port Arthur ward water in Thunder Bay. In the same memo the city engineer admitted this by saying that: "a heavy load of industrial waste is dumped into the lake not far from the Bare Point intake."

The dispute over safe drinking water, then, was not over the source of the problem but over the solution. If the city was itself breaking health standards it was unlikely that it would put pressure on local or U.S. industries to meet them. So the city engineer proposed that the local water be chlorinated to overcome the bad smell and taste.

#### Hazards in Food and Water

It has been shown, with thorough epidemiological studies, that airborne asbestos can cause asbestosis (fibre damage to the lungs and shortness of breath); pleural calcification (insoluble calcium in the lung linings); lung cancer; and mesothelioma (cancer of the chest lining and abdominal

cavity). But government and industry still disclaim that ingesting asbestos has the same deleterious effects. And the logic they use is strikingly similar to that used years ago to deny the effects of airborne asbestos.

There is some direct evidence that ingesting asbestos is a serious health hazard. In Japan, a high rate of stomach cancer has been linked to asbestos in the talc used to dust rice crops. Experiments with rats and primates have shown that large amounts of asbestos in the diet can cause malignant tumours in the kidney, brain, lymph-nodes and peritoneum. Experiments with rats have also shown that smaller asbestos fibres can penetrate the digestive tract and accumulate in the brain and tissue surrounding the small intestine.

None of the evidence is about human health hazards. Clearly there is the need for epidemiological studies on humans who have ingested asbestos. Dr. Irving Selikoff began such a study in Duluth in 1973, but no such studies have been undertaken in Thunder Bay. It has been irresponsible of government officials to downplay the health hazard from drinking asbestos without even investigating the problem directly.

#### Ideology and Public Policy

The most glaring recent example of the commitment of health officials to piecemeal, after-the-fact research is their refusal to relate the health hazards of inhaled and ingested asbestos. Our bodies, after all, do not work the way overspecialized "experts" try to understand our health problems. Our respiratory and digestive systems work as an organic unity, not as isolated, mechanical functions. Half of the asbestos which is inhaled by workers in this industry, for

example, is actually swallowed and ends up in the gastrointestinal tract. And evidence exists that these asbestos workers have high rates of stomach cancer, not just lung cancer. An unreleased study done for the Ontario Workmen's Compensation Board by pathologist Dr. A. C. Ritchie, of the University of Toronto, apparently establishes this relationship.

If swallowing asbestos can lead to stomach cancer, then it seems reasonable to suspect drinking it can do so as well. But the last line of argument which will be used by the apologists for industrial pollution will again be the numbers game. They will predictably say that asbestos miners swallow far greater quantities of asbestos than can be ingested through drinking water. They of course don't mention that asbestos in water has reached 250 million fibres per litre at Beaver Bay, near the Reserve Plant.

The attempt to establish arbitrary safe limits for such cancer-producing pollutants as asbestos has not, however, been successful. The Selikoff studies, for example, show that even small periods of exposure increase the chances of cancer. This points out the need to solve the problem at its source rather than always dealing with symptoms.

There is a widespread myth that "correct" explanations for environmental controversies must remain inside the domain of the physical sciences. But disputes like these that involve economic and political relationships cannot be articulated solely in terms of technical measurements. We have to learn to advance specifically environmental explanations.

The mishandling of the asbestos (or sewage or phenol) problem is clearly not understandable in terms of individual shortsightedness or incompetence. To reduce it to the level of personalities would be a strategic error for the environmental

health movement. There is clearly a more fundamental reason for governmental mishandling, in the very ideology and structure of the economy itself. Within the present economic framework, the environment becomes the private property of those with the economic power to operate polluting industries and to ensure legislation and inspection practices that favour them. Within the existing economy, for all practical purposes, Lake Superior is the backyard of Reserve Mining, Abitibi, the Corporation of Thunder Bay and other polluters. They are all relatively free to do with the Lake as they please. Within this framework there is a lot of talk about individual freedom and the public good but these worthy ideals end up meaning that the public has the right to drink polluted water.

This subversion of the health of the Lake and the people who depend on it will not be overcome until we see through the bureaucratic and professional apologies that we hear over and over from government and industrial officials. As long as we take language for granted and assume that the authority of the person speaking determines the truth of the words spoken we will be left barely understanding one environmental health issue before we are confronted with yet another.

The environmental movement therefore needs to develop a political ecology to combat the political "science" of the elites and rulers. The interests of the vast majority of humanity are the same as the interests of other forms of life on the planet. It is the task of a political ecology to counteract environmental sensationalism and to forge a thoroughgoing solidarity in the struggle for personal, collective and environmental health.

Reprinted from *Alternatives* Winter 1978

The Wadebridge Press Announces:

## **THE STABLE SOCIETY: ITS STRUCTURE AND CONTROL: TOWARDS A SOCIAL CYBERNETICS**

by

Edward Goldsmith

There is much talk of a steady-state or stable society. Few however have considered what this really implies.

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The author hopes that this book will stimulate a new approach to the study of human societies — one that might be referred to as 'Social Cybernetics'.

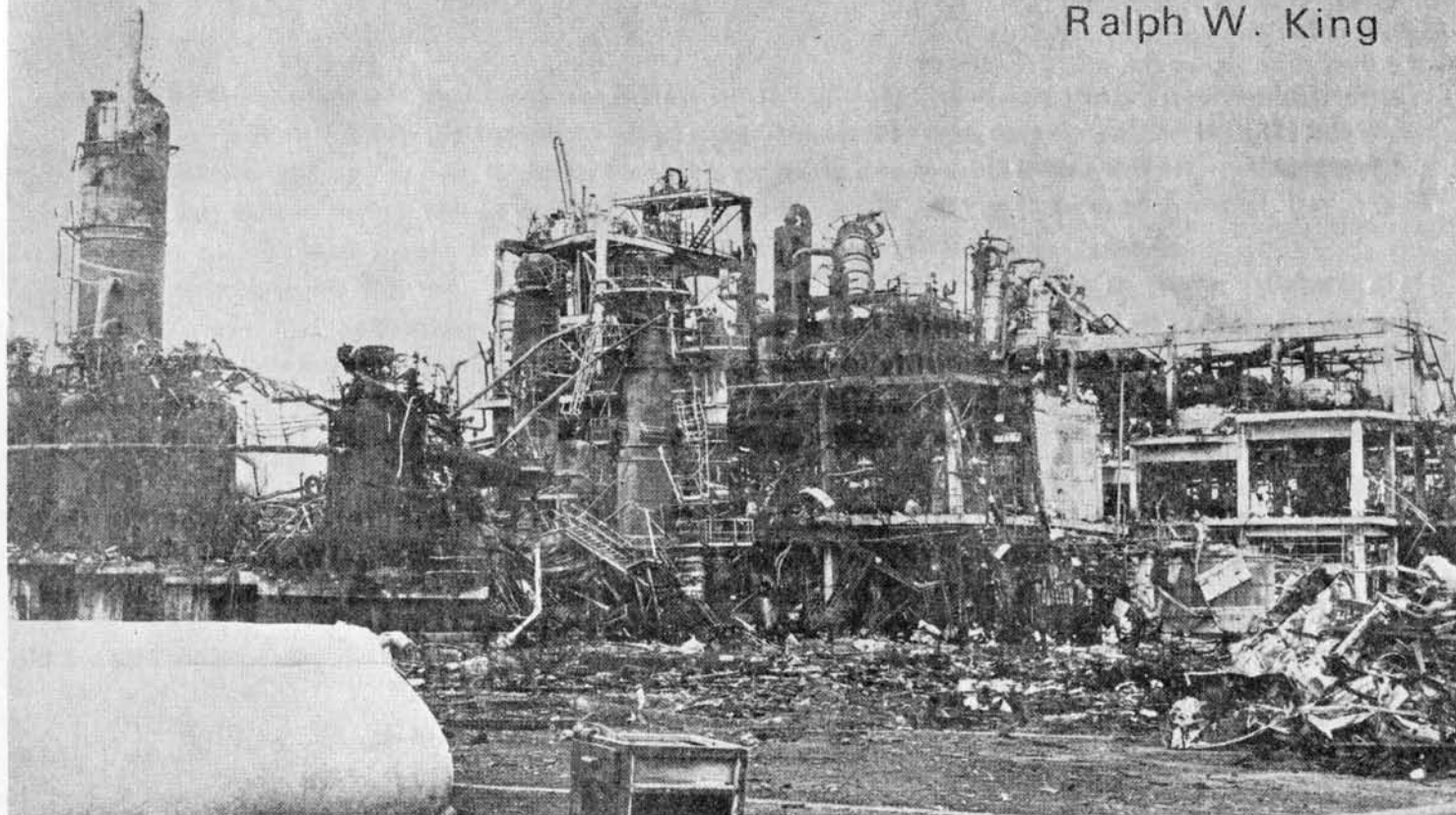
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# Why public inquiries have false teeth

Ralph W. King



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**In June 1974, an explosion wrecked the Nypro chemical plant at Flixborough. Did the Public Inquiry, headed by Mr. Justice Parker and Sir Frederick Warner, take all the relevant factors into account? Do these massive exercises in public relations have any meaningful effect on future policy?**

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I was involved from shortly after the Flixborough disaster until the start of the Inquiry as one of Nypro's technical advisers, charged with investigating the cause of the disaster which occurred on the afternoon of Saturday June 1st 1974. It was a fascinating assignment though fraught with problems. It led to so many disagreements with my colleagues and officials representing Nypro (UK) Ltd. that I was obliged to withdraw, though

continuing to watch the course of the inquiry from time to time from the sidelines.

In August, 1974, after a particularly unpleasant incident in which I believed I had been sacked, I went to have a chat with Sir Frederick Warner. What I told him is of far less relevance than what he told me. "It's just like you King", he said, "to fall out with your client over the disaster, and it's why you will never get on in the world". He then went on to tell me that he and his staff believed that the failure of the bridge pipe and bellows assembly resulted from a pressure rise caused by the ingress of steam or water into the reaction system. I left feeling somewhat deflated because I had other ideas.

At that time I saw no reason to accept what Warner had said regarding the role of water. If he were right, he should be able to prove his point, since he had virtually the entire technical resources of the country to call on, whereas I could get no support for a proper examination of my own theory. To solve the riddle of the Flixborough

disaster, all possible explanations had to be examined impartially and scientifically.

Since I did not support the hypothesis endorsed by Nypro, I had little involvement in the Inquiry, but spent much of my spare time developing and testing my own ideas and modifying them in the light of hard facts. By May, 1975, I had been forced to reject some of the original features, and to admit that water, favoured by Warner nine months earlier, had played a key role in an internal pressure rise which caused the disaster. But instead of the broad general theory that Warner had put forward I had a fairly detailed step by step picture of exactly how this happened — where the water came from, what happened to it during the initial hours of start up on June 1st, 1974, and how it came to cause a sudden pressure rise in the plant, sufficient at least to have ruptured the unsound bridge pipe assembly, and probably to have ruptured it even if it had been soundly designed and constructed. A logical chain of events which made disaster virtually certain was beginning to emerge. I

had been prompted to do this by the uneasy feeling that the participants in the Inquiry were 'barking up the wrong tree'. Somehow I had the clues which if properly interpreted would prove the key to the disaster. It became a compulsive activity from which I could not escape.

I remembered the two Comet disasters at Rome airport in 1954. The investigations which followed the first one failed to bring the metal fatigue problem to light. It was only after a second similar disaster that the true cause was established.

These feelings hardly endeared me to my former colleagues or client by whom I was regarded as a defector. It seemed to me that they had become slaves to the 'adversary principle' prevalent in litigation, which is entirely inappropriate to the objective investigation into technical causes of any accident, large or small. This point was well made during the Inquiry by Professor Ubbelohde in a letter to the *Financial Times*,<sup>1</sup> and has since been taken up by Dr. Mecklenburgh in a critical but constructive paper on the conduct of inquiries into disasters in the process industries, published in the *Chemical Engineer*.<sup>2</sup>

#### The Court's Report and the Role of Water

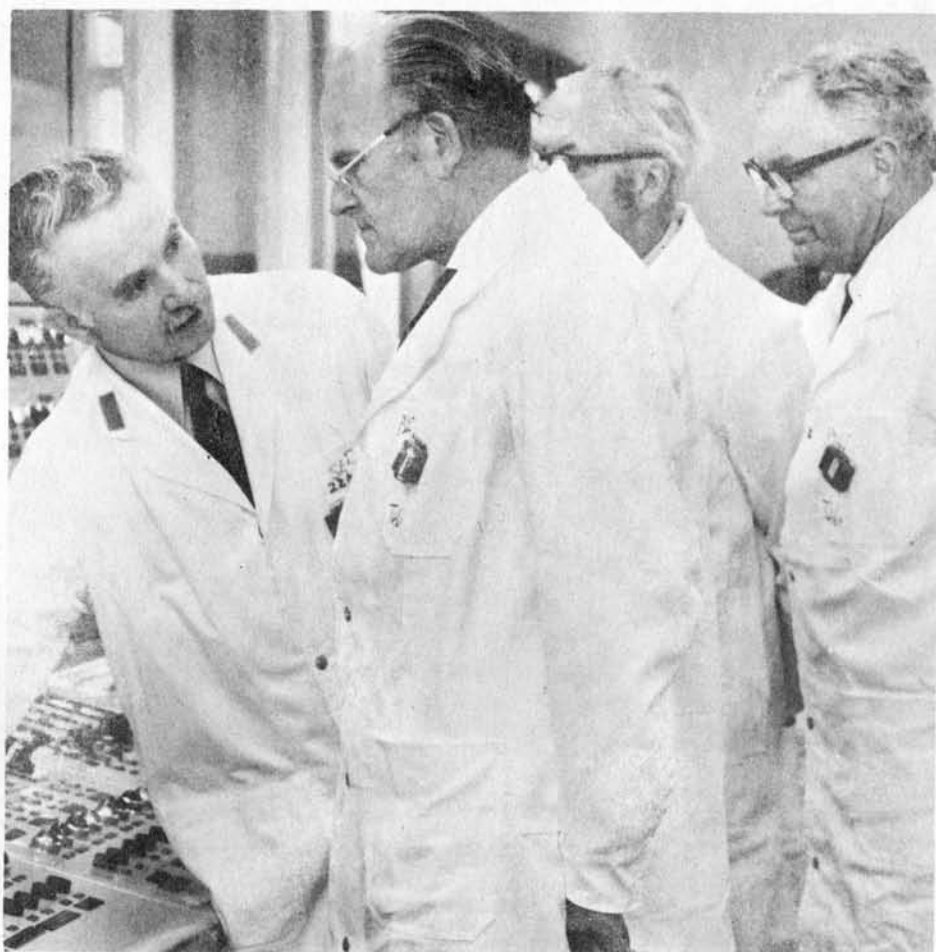
The official report, published in May, 1975,<sup>3</sup> fails to mention the presence of water in the system or the removal of the stirrer from No. 4 reactor in January 1974, as possible or even contributory causes of the disaster.

"During the course of our investigations the possibility of a sudden rise in pressure during the final shift due to some internal incident was considered. We were able to exclude all of the possible internal incidents suggested. Of them we would mention only two:"

(1) "the possibility of the rapid decomposition of an accumulation of peroxides in the system:" (this in fact had been the basis for my early ideas)

(2) "the possibility of the operation of a nitrogen purge having occurred."

"As a matter of probabilities we exclude both and we mention them specifically only to show that



Mr Justice Parker at Windscale

they have not been overlooked. There was some evidence before us to suggest that either could theoretically have occurred, but we were satisfied that both were unlikely."

Further, the flow diagram of the cyclohexane oxidation plant given in the Report, curiously omits two items of equipment which would have played a key part in the ingress of water to the reaction system, the water separator S2522 and the reboiler E2521.

The Report however admitted that there were some gaps or improbabilities in its own explanation.

"We therefore conclude that rupture of the assembly within the temperature/pressure relationship which could reasonably be expected to have occurred in the last shift is a probability albeit one which would readily be displaced if some greater probability to account for the rupture could be found. The only other possibility suggested was the 8 inch hypothesis."

Despite the absence of any reference to the role of water in the Court's Report, in its account of the events on June 1st which preceded

the disaster it mentioned several events which were themselves circumstantial evidence for the presence of a considerable quantity of water in the reaction system, as the plant was being started up. What has happened to Warner's views which he held in August 1974, about the role of water? I called on him again and found him strangely bashful on the subject. However he drew my attention to his firm's second report to the Court of Inquiry which I had not previously studied, and in particular to appendix VII.<sup>4</sup> Nearly the whole of this report deals with the general possibility of an internal pressure rise in the plant caused by the presence of water. The report shows calculations made both by Cremer and Warner, consulting engineers, and Dutch State Mines on the quantity of water required in the reaction system on June 1st to give a pressure rise of 1 kg/cm under the conditions prevailing at the time of the disaster. There was a fantastic difference between their results. Dutch State Mines claimed that 6.3 tons of water were necessary; Cremer and Warner's calculations showed that only between 200 and 300kg were



needed. The report was submitted in support of evidence but not actually given in evidence.

I had earlier in developing my own ideas on the role of water, come up against Dutch State Mines' figure of 6.3 tons, and quite independently of Cremer and Warner had reached the conclusion that it was rubbish. My own calculations gave a figure of the same order as Cremer and Warner's, although the actual calculations both of Dutch State Mines and of Cremer and Warner were demonstrably unsound since they violated Gibbs Phase Rule.\*

Faced with this conflict of views between their own technical advisers and Dutch State Mines the Court appeared to have dropped the issue and passed on to examine other arguments which they could more readily understand.

It was curious to find that the staff of Cremer and Warner who had been involved in the investigations still believed that water played an essential role in causing the disaster. Dutch State Mines, however, continued to deny either that the removal of the stirrer or the settlement of water which followed had anything to do with the disaster.

I could not escape the conclusion on studying Cremer and Warner's second report to the Court of Inquiry that they had for some reason 'pulled their punches'. Sir Frederick advised me, since I apparently had a plausible explanation for the disaster which was entirely missing from the official Report, to work it out systematically step by step and if it still all fitted together, to offer it for publication. This I did, and the explanation was published as a paper in *Process Engineering* in September, 1975.<sup>5</sup>

Mr. Jas, vice president of DSM, who previously had resisted all suggestions both from Cremer and Warner and myself that the disaster was likely to have been caused in this way, was sent a copy of the paper before publication. His first reaction was to telephone me from Holland, congratulating me on the work, and saying "this time King you have hit the nail on the head".

The essential steps in the explanation were as follows:

\* The number of phases in a system plus the number of degrees of freedom is equal to the number of different kinds of molecular components plus 2.

(1) There was water in the reaction system comprising C.2544 and reactors R.2521, 2522, 2523, 2524 and 2526 as the plant was being started up on June 1st. This was inevitable, since C.2544 contained 40 cubic metres of packing through which water had been passed during the shut down, and which would not drain completely. There was also in all probability some water in reactors 1 to 4, perhaps left from the previous run, which could not be drained.

(2) During the initial stage of circulation, the water was transferred in suspension in cyclohexane to reactor 4 where it settled, since the stirrer had been removed in January 1974.

(3) During further circulation the temperature of cyclohexane in reactor 4 rose to about 155°C with a layer of cooler water below.

(4) The temperature of the water rose until the interface between the water and cyclohexane reached 145°C. At about this point, the mixture of water and cyclohexane at the interface started to boil, since the mixture has a much lower boiling point than either water or cyclohexane. This caused the rest of the water layer to mix rapidly with a larger amount of cyclohexane above it. The whole mass then boiled rapidly, like a cup of water poured into a pan of frying oil. There was a rapid rise in pressure and liquid was thrown violently against the cover of the reactor and into the bridge pipe assembly which ruptured.

The explanation was supported publicly by the editors of *Chemical Age*, *Process Engineering* and *The Engineer*. An editorial in the last magazine called for a re-opening of the public inquiry.

I visited Mr. Jas in Holland just before the article was published. There were several other unsatisfactory features concerned with the Flixborough Inquiry which I wanted to discuss with him and although our discussions were frank I would not call them friendly. But in talking of the Inquiry and why the hazard I had highlighted had not come to light in the course of it, he made one memorable comment. "There are those in your country", he said, "who understand Dutch State Mines' problems."

## Linking Events

The disaster on June 1st was preceded two months earlier by a near disaster on 27th March when a large vertical crack appeared in the mild steel shell of No. 5 reactor whilst the plant was operating, with hot cyclohexane inside it, under much the same pressure as on June 1st, the day of the disaster. When a split occurs in the side of a large pressure vessel containing a superheated hydrocarbon liquid, this commonly results in complete rupture of the vessel with escape of the hydrocarbon into the atmosphere and its ignition and explosion. A number of such explosions have occurred in the U.S. and elsewhere, particularly following accidents involving LPG road and rail tank cars; they are known as 'BLEVEs'. It seems clear that on March 27th, the plant was depressurised and shut down only in the nick of time.

This incident was investigated by Dutch State Mines and samples of the split reactor wall were sent to Holland for metallurgical examination. The report on this failure did not reach Nypro until after the disaster. It stated unhesitatingly that the crack was caused by "nitrate stress corrosion", this being considered full and sufficient explanation for everyone, and I do not recall any other cause being considered. I also do not recall a single British member of Nypro's staff being satisfied with the explanation. I certainly was not happy with it.

The samples of metal tested were taken not from the centre of the crack in the highly stressed region near the large branch on the vessel where the crack almost certainly originated. They were taken from near the ends of the crack. Now the crack was clearly spreading while lagging was being removed from the outside of the vessel on March 27th to discover the origin of the leak, and water, slightly contaminated by nitrates, was being sprayed on the outside of the vessel and lagging as the crack was being uncovered. It appears from evidence given in Court that the crack spread through the areas of metal which were removed for examination whilst the lagging was being removed and whilst water was being sprayed on it. Thus while the examination may

have showed that the spread of the crack through these areas could be ascribed to nitrate stress corrosion, it tells us nothing about how or why the crack originated.

The Health and Safety Executive were later to issue a Technical Data Note which made the same point — although without specific reference to Flixborough. "It is important to appreciate," they wrote, "that cracks may exhibit the characteristics of nitrate stress corrosion towards their tip, but not at their origin. In such cases, the real cause of the cracking could be fatigue or some other phenomenon, and the presence of nitrate cracking is almost irrelevant since the failures may occur even in the absence of nitrates." <sup>6</sup>

The Court of Inquiry accepted Dutch State Mines' belated explanation for the crack in the side of No. 5 reactor as their own, without question, and so far as I know without any proper independent examination.

"The cracked reactor R2525 initiated the sequence of events which led to disaster. Examination of the crack by expert metallurgists showed that the crack had been caused by nitrate stress corrosion. The corrosion was created because nitrate treated cooling water had been used in the past to dilute small leakages of cyclohexane from the plant."

This seems to be another instance where the Court were prepared to accept questionable statements from Dutch State Mines on blind trust, without any critical assessment. It was one of the matters I discussed with Mr. Jas during my visit to Holland in August, 1975.

If the crack in No. 5 reactor was not started by nitrate stress corrosion but by something else, then the Court had to account for two and not one, major unexplained failures in the reaction system, happening within the space of little over two months. Sometimes the solution to two similar events is easier than one, since one is prompted to look for a common cause or prior event. The removal of the stirrer from No. 4 reactor in January 1974 was the prior event. There is less evidence to link this with the failure of No. 5 reactor in March than with the failure of the bridge pipe in June,

although I am satisfied that the connection was very likely. Still it remains somewhat of a '*post hoc propter hoc*' argument. Had the Court not been so timid, a much tidier and more logical picture might have emerged.

### General Criticisms

My first and main criticism of the Court is simply that it failed in its main objective of establishing the cause of the disaster, and pointing out the lessons which could be learned from it. This easily happens in an Inquiry of this nature where it may not unfairly be assumed that few besides the Court and its advisers are truly objective and have an interest in reaching the truth, while they are surrounded by parties consisting mainly of bureaucrats and big business whose main object is to prevent their errors and omissions from being found out. In such a case the Court is rather like the blindfolded child in a game of 'blind man's bluff'.

It seems clear to me that the Court placed far too much emphasis on the role of the faulty bridge pipe assembly as the cause of the disaster, and ignored a host of other factors at least equal in importance. My personal belief is that under the conditions prevailing on June 1st, 1974 — the disaster would have occurred anyway whether the bridge pipe was sound or faulty. And what would the Court have made of the disaster had it occurred on March 27th? Would they meekly have swallowed the story that it was all because of nitrate stress corrosion?

Altogether, the outlook for strict impartiality and an earnest desire to get to the bottom of things in the Windscale Report seems rather bleak. The Inspector and his advisers must have been faced with much the same, bureaucratic pressures as they were at Flixborough, and there seems little reason to think they will be more successful in resisting them. I would like to finish with a quotation from: *The Acceptability of Risks*<sup>7</sup>, which requires no further comment from me.

"As a nation we are well aware of the dangers of a bureaucracy creating a world of its own administrative concepts and then wielding power by forcing the affected

public to conform. Although it is widely known that power corrupts, we are as a society less well aware that impotence also corrupts, especially when it is linked to responsibility. An inspectorate that cannot enforce its requirements must either confess its impotence or conceal it from view. In the latter natural course, the inspectorate denies all cases of abuse except for the most flagrant: and in doing so becomes implicated in their continuation. Thus a weak inspectorate is pushed towards identification with those who create the risks, to the detriment of those who experience them. Though the agents may be honourable men, and quite aware of their dilemma, nonetheless they may be powerless to influence an inherently corrupt situation.

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### Retrospect

On the day they played the  
film backwards  
bombs and their victims  
reassembled  
green mountains grew out of  
Coca-Cola cans  
forests out of the Sunday  
Supplements  
lakes from the neon  
advertisements  
whole landscapes out of cars.  
And the sound-track grew so  
quiet  
you had to begin to listen.

Michael Tanner



# Food from the locust plant

by David W. Greenstock

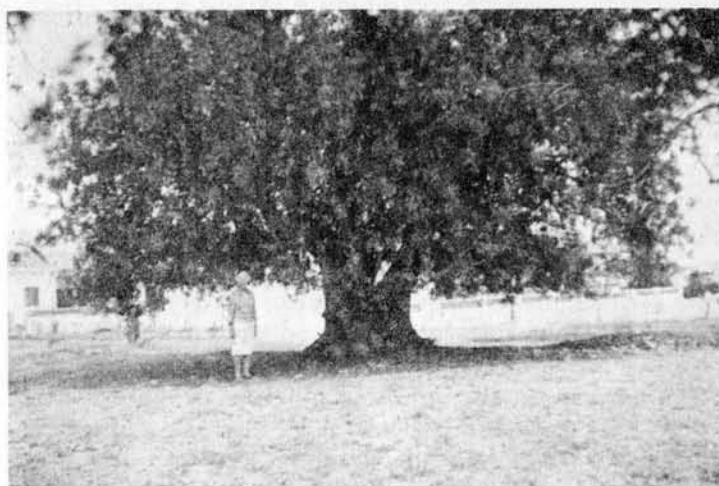
The problem of what is known as the protein gap in the under-developed countries is still with us, in spite of all the efforts made in various ways to solve it. The failure can be attributed to many basic causes, among them the introduction into those countries of European foods, especially the over-refined carbohydrates, and foreign feeding habits which can do more harm than good, together with a short-sighted and mistaken attitude of mind towards the problem. We have forgotten that the European mind works in an entirely different way from that of the inhabitants of these countries, because the basic philosophy is different.

The under-developed countries need to be taught how to stand on their own feet where nutrition is concerned and, as far as possible, this should be done at a local village level. In a word, their primary need is the "know-how to increase food production, together with the introduction of new crops, adapted to various regions and climatic conditions, with a high protein value; rather than aid in terms of money or tins of European food, most of which is "creamed off" long before it reaches the poor for whom it was intended.

The flight from agriculture to the large towns and industry, one of the many causes of inflation, will only be brought to a halt by a programme of aid which puts the farmer on a level with industrial workers, but strictly on a village basis. As a long-term policy, this is essential, because people cannot eat cars, radio or television sets. It is also good politics, because the people who give least trouble in terms of strikes, wage demands and so on are the farmers — they have too much to do! Until we realise that in these under-developed countries, the rural population at the village level is the most important, our aid to those countries will always fall short of their real needs. It may be impossible for us to put the clock back in Europe by bringing about a migration from industry and the large towns back to agriculture, but at least we can prevent our mistakes from being repeated in the under-developed countries.

## A Tree for Poor Soils

This paper describes an experiment which has proved successful in the poorer districts of some regions in India and in two South American countries, always on a strictly village level. The idea behind this experiment came to us some 15 years ago, when our Research Department was invited to visit the Tarragona



An 80yr old Carob in Southern Spain

area of Spain. During this long visit we were able to inspect many farms in the area, and one thing attracted our attention — the extensive plantations, on the poorest possible soil, of a large tree, *Ceratonia siliqua*, which gave a high yield of edible pods every year, with little or no attention.

The local farmers told us that the tree was invaluable to them, because it was the only plant (except for a few tough weeds) which would grow and even prosper in the poorest of soils, even on rock slopes, and that the income from the sale of the dried pods was sufficient to justify these plantations. The meal made from the pods was highly appreciated as an important element in the combined feeds for animals, and also the finer flour could be exported to other countries.

A detailed study of the tree shows clearly its preference for warm climates where the temperature does not drop below zero. This study was also fascinating, because it revealed that the locusts eaten by John the Baptist in the desert were most probably not the insect, but the pods of *Ceratonia*, which is sometimes called the "locust bean". The same can be said of the husks mentioned in the Parable of the Prodigal Son as food for swine, as can be seen from St. Jerome's translation. Perhaps for this very reason the pods are called "St. John's Bread" in some countries.

So far as soil conditions are concerned, the tree, once established, makes few demands. It will grow and prosper in the worst possible soils, provided they have sufficient lime in them, even among rocks, where few other plants can survive. It does not like clay soils or those in which there is excessive moisture. For this reason it gives good results on the slopes of hills, where



Young Carob with annual crop

the drainage is good and where it acts as a very effective protection against soil erosion.

The last factor is important in a country like India, where experts estimate the loss of good soil through erosion at about 6000 million tons, with the subsequent loss in nutrients such as nitrogen, phosphates and potash. Plantations of *Ceratonia* could avoid much of this and be more effective than the methods in use at the present moment and at less cost. The tree has only one serious enemy, a noctuid moth, *Zeuzera oesculi* L. whose larvae burrow into the wood and can kill the tree within a few years.

This evergreen can grow to a height of over 50 feet when fully developed. It will not grow in areas where the winter temperature falls below zero for any length of time and in countries or areas where the summer temperatures are very high, it is important to site plantations on slopes or at high altitudes. For example, the tree will grow and prosper in Africa in places where it has been planted at altitudes of over 800 metres. If it is sited relatively near the sea, the tree will benefit greatly and will produce more pods.

#### Seeds in a Bamboo Cane

The propagation of *Ceratonia* is reasonably simple. There are several methods usually employed and each one has its supporters. Some prefer to sow the seeds in groups of three directly on the site where the tree is to spend the rest of its life, the strongest seedling only being left to develop. Other growers employ pots of various kinds, mainly of clay or fibre, from which the tree can be transplanted after two or three years of growth. Others use a method which has come down to them over generations and which is widely used in Spain for growing many plants; the seeds are sown in bamboo canes or maize stalks, of about six inches in length, previously hollowed out and filled with fine soil with plenty of lime in it. Some cuts are made at the bottom of the canes to ensure a lateral root-run. They are then planted, either at the site the tree is to occupy or in special seed beds for later transplantation.

The trees will begin to produce after about ten years a quantity of long, edible pods, which should be allowed to mature on the tree before harvesting. The optimum moment for collecting the pods is simple to calculate — ten days after the first dry pods fall off the tree, and on a dry day.

#### Many Uses of the Carob-bean

The fruit of *Ceratonia* has many uses, some industrial, for example the production of a high grade alcohol; as a component of animal feeding stuffs and, of course, as a flour for human consumption. In the case of animal feeds, a coarse milling is sufficient, once the seeds have been removed from the pods, but in the case of flour destined for human consumption, a finer milling is better. This flour can be produced from the whole bean, from the pulp once the seed has been removed, or from the germ of the seed itself.

#### The Carob-bean Tree in India

In the India experiment we used only carefully selected seeds, the moisture content of which was checked, to make sure that no fungi would emerge

during the journey. The seeds were then submitted to irradiation, both to disinfect them and also ensure better germination. Eight kilos of seeds were sent to a reliable agent in India, who had offered his services free of charge. He was given instructions concerning the raising of the trees from seed, and their after-care.

After two or three years in the seed-beds, the young trees were planted round or near the poorer villages, as the property of the whole community which then became responsible for their care and the harvesting of the fruit when the time came.

Three main areas were chosen for the first plantations: the Gujarat State, Bagasara, and Bhavnagar which is near the sea coast and has the poorest possible soil. Since direct sowing of the seed did not give very good results, the main plantations were made from two-year old trees, cultivated in seed-beds by the pot and cane methods.

The trees grew well, with few losses due to natural conditions, the main enemy proving to be goats, which invaded one plantation with deadly results! Even in the very poor soil of the Bhavnagar area the trees grew to an average height of 19 feet in seven years with a trunk circumference of 15 inches. Six years after planting out, the trees began to fruit, giving an average crop of 20 lbs. per tree. The villagers have taken to the flour and it is now highly appreciated.

From reports it would seem that the tree produces fruit earlier in India than it does in Spain, and that the pods and seeds are slightly smaller. This may be caused by climatic and other conditions. It remains to be seen if sowings from these seeds give satisfactory results. Any scheme of this kind should aim at plantations round the poorer villages, as a patrimony under the care of the whole community. Local missionaries would be ideal agents for the distribution of the trees, together with instructions as to care and the use of the fruit produced. It seems to us that the project is worth taking up at an International level.

#### THE RESULT OF THE DIG

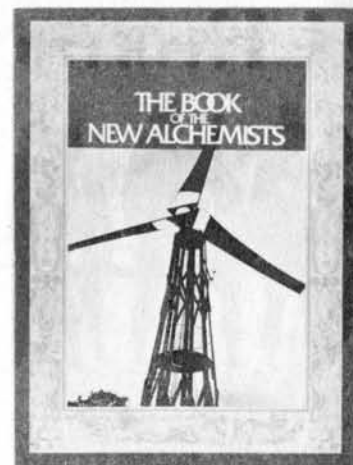
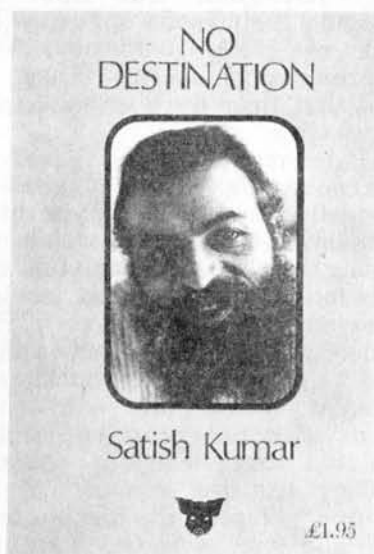
"So it finally turned out after endless years of digging and researching, that the only bones found at the Olduvia Gorge were those of fellow anthropologists, who likewise were searching for earlier evolutionary specimens. You had Neanderthals looking for Homo Erectus, Homo Erectus excavating for Australopithecus, Australopithecus probing for the early anthropoid apes, who in turn sought out the first mammals. The earliest thing they found was a tree shrew, and nobody knows exactly what it might have been looking for. Frankly by that time, nobody gave a damn."

Peter Payack

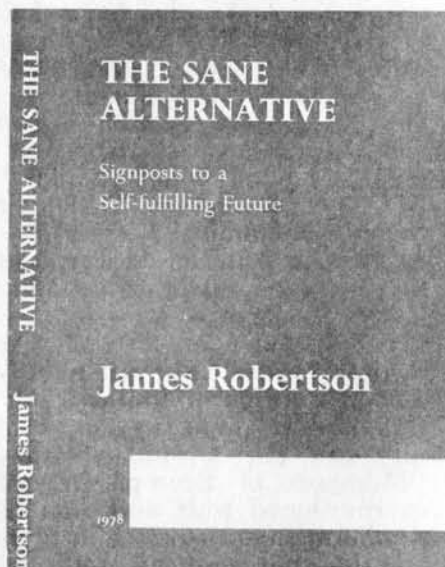




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# ECOPOLITICS



## First Birthday Party

Ecoropa, the European Ecological Action Group, is a year old. It owes its existence largely to the determination of one man, Edouard Kressman, who resigned as Chairman of Kressman and Cie, one of Bordeaux's best known and oldest wine merchants, in order to devote himself full-time to coordinating Ecoropa.

Worried by the splits that were fragmenting the ecology movement in their home province of Aquitaine, Kressman and a group of friends began thinking around the problem of uniting ecologists into a coherent political force. "Too often", he explains, "local initiatives seem to lack impact for two reasons: without strong philosophical roots, they quickly peter out; and because they are not seen as part of a wider movement, their real significance is overlooked."

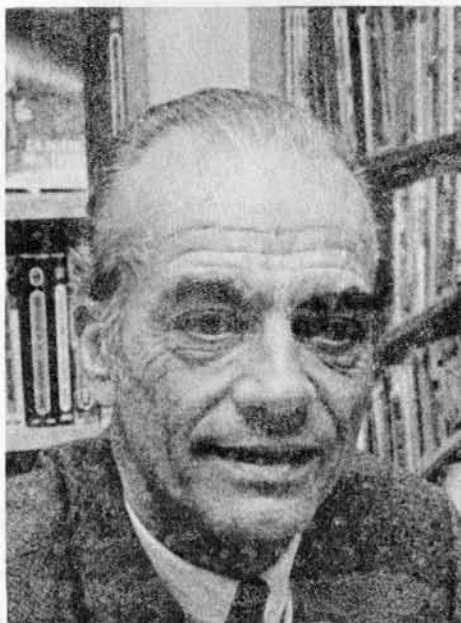
What emerged was the need for a group that would stress the *European dimension* of the ecology movement. Moreover, if ecologists are to gain serious attention, says Kressman, they need first to change their negative image. Doomwatching, often verging on nihilism, has undermined their credibility. "Ecologists have to demonstrate that *they*, rather than the establishment, represent the forces of sanity; and that it is the traditional Left and Right wing parties who have their heads in the clouds — while the ecologists are the realists."

Together with Jacques Ellul, author of *Technological Man*, Kressman sent a circular letter to all the major environmental leaders in Europe, telling them of his plans, and inviting their comments. "The Club of Rome," they wrote, "has admirably highlighted the problems facing the world: the time has come to engrave the other side of the coin — to show what can be done, and mobilise the people of Europe around a Charter of Hope." Disappointingly, few replied, and

those that did were rarely encouraging. Kressman and Ellul were banging their heads against a brick wall of group jealousies, vested interests and apathy. They were told that they were attempting the impossible.

Undeterred by such pessimism, the two sent out an open invitation to a meeting in Paris. "If you have a problem", says Kressman, "it seems sensible at least to talk about it before dismissing it as insoluble. We wanted to hear what people from widely different cultural, religious and professional backgrounds thought about the idea — to confront them with our proposal, and see whether there was any chance of getting it off the ground." To their surprise, some thirty people turned up, and such was the measure of agreement that by the end of the weekend, they had drafted a common declaration (see *The Ecologist* Jan/Feb 1977).

In the following months, Kressman committed himself to broadening the membership, establishing contacts all over Europe,



Edouard Kressman

not only in the nine EEC countries but elsewhere also. "We hope one day to break through the Iron Curtain", he says. In September, there was a colloque at Metz. Its aim was to discuss the formation of a 'Europe of the Regions' — how it would work and how it could be established. Fifty eminent Ecologists from a dozen different countries attended. Aurelio Peccei, founder of the Club of Rome, who was unable to attend owing to prior engagements, sent a telex endorsing Ecoropa's basic aims. The participants issued a further declaration accusing European governments of 'fostering the illusion that economic growth can bring prosperity, jobs and a reduction in inequalities: of imposing nuclear programmes without taking account of their disastrous ecological, social and military consequences; and of building the future of Europe on criteria and values that have totally lost their relevance and on technological expedients that we know cannot work.' They called on European governments to abandon the ideology of economic growth, and hence to repeal Article 2 of the Treaty of Rome which commits the EEC to fostering growth wherever possible. Committees were also set up to look into various aspects of the Ecology Movement and to further its cause.

Ecoropa has since become a legal institution, and although Kressman recognises that its future will be fraught with problems, he is hopeful of its eventual success. "Members of Ecoropa are often overburdened with work and other commitments: money is short; and time and language problems are rife", he says. "But the initiative has been taken, and the interest is there — indeed our message is already beginning to seep into government institutions." That seems a pretty solid achievement for an organisation that started only twelve months ago.

## Luxembourg's New Colonialists

Faced with increasing local opposition to the siting of nuclear power stations in the Fatherland, West Germany's largest power company, RWE, sought to export its problems by building a reactor at Remerschen in Luxembourg and importing electricity at extremely favourable terms. This nuclear colonialism has misfired however. Last December, an anti-nuclear veto was forced on Luxembourg's coalition government, headed by Gaston Thorn, head of the pro-nuclear Liberal Party. The veto

follows a motion for a moratorium of 'several years' on the development of nuclear power being passed, by three votes, by the Luxembourg Socialist Party at their annual conference. The decision was largely the result of the activity of CNAM, the national committee for a nuclear moratorium. RWE and other interested parties say they will campaign vigorously to have the veto overthrown. But CNAM is doubling its efforts also.

Manfred Siebker



## Friendly Fascism

In a statement to the press, the BBU, Germany's National Union of Citizens' Groups, observed that citizens' groups, as well as individuals campaigning actively against nuclear power, are subject to rising pressure on the part of government agencies. "The prosecution of opponents of nuclear power is getting more and more hysterical and verging on the absurd".

Examples of harassment:

- \* Fines imposed on people are of such a size that they threaten their material existence. Penalties to the tune of DM 5000 (about £1000) were imposed upon several anti-nuclear demonstrators, picked out of the crowd at random by the police at the Brokdorf rally.

- \* Conservation groups are denied 'non-profit' status since their activities are also directed against nuclear power. A citizen's group in Freiburg is to be denied its non-profit status retroactively (back to 1974). Another group in Westphalia, had its non-profit charter cancelled shortly after it had been granted.

- \* Persons working for State authorities are not allowed to wear an anti-nuclear badge or button. The Department of Education of the State of Hamburg has issued a directive



Increasing harassment for Germany's Anti-Nuclear body

on this to teachers.

- \* The German Postal Authority has started refusing to send letters bearing anti-nuclear slogans.

- \* Members of citizens' groups have been prevented from distributing leaflets by police training machine guns on them, and leaflets have been seized in Bremen.

- \* Increasingly the law is being stretched by the courts. Orders for

the arrest of participants in the Grohnde demonstration were issued without sufficient legal basis.

If the West German government wants to encourage terrorism, then surely this is a good way of going about it.

Lothar Mayer

## Fissioning Support for CANDU

In late 1976 the ruling Liberal Party's Director for the Ontario region — Canada's largest and most politically significant — presented Prime Minister Trudeau with a statement and recommendations that shattered the cosy image of thoroughgoing popular support to Canada's nuclear energy programmes. In his statement *The Consumer and Nuclear Energy — A Luxury We Can No Longer Afford*, Ian Connerty began with a summary of the economic, environmental and social arguments against Canadian nuclear energy, and then went on to

outline, in a 26-point series of recommendations, new policies and programmes that would spell the end of nuclear power, and the more rapid transition to a consumer society based on renewable energy.

The introduction and rationale of the 10-page statement is packed with telling statistics, many of which are the kind that simply are not available in the UK, or are only to be "guesstimated" from the irritating and undemocratic process of monitoring replies and statements piecemeal from official replies to a variety of charges from environment

and consumer groups. Thus Connerty's paper sets out the facts on how many tax dollars have been pumped into Atomic Energy of Canada Ltd (AECL), and its CANDU (Canadian deuterium-uranium reactor) programme since the atom "went peaceful" in the early 1950s: a cool \$1.3 billion, for research and development. This is then followed by the costs of building Canada's CANDU reactors — some \$1.8 billion. Yet despite this injection of over \$3 billion, which should mean that Canada obtains a significant slice of its energy from the atom, its return in 1976 was a mere 1.6 per cent of national energy. By comparison, an investment in conservation, according to the Science Council's Chairman Dr. Kates, could save the same amount of energy for one-tenth the cost. Connerty also refers to the potentials for solar energy. Even with collector systems still tending to be semi-experimental, I was able to show in a study I undertook for the Science Council in 1976, that investing \$3 billion might yield as much as 4 per cent of today's energy demand.

Connerty's document then goes on to take a hard swipe at the now fast-receding fantasy vision of "a better

## SCRAM: Mass Demonstration Planned

With the Scottish Electricity Board announcing that it plans to build ten nuclear reactors over the next twenty years, SCRAM, the Scottish Campaign to Resist the Nuclear Menace, is finalising arrangements for a mass demonstration at Torness, site of Britain's next reactor. Support for the demonstration, to be held on the weekend of May 6th and 7th, has already been encouraging: several groups, including the German BBU (see report: Friendly Fascism),

Greenpeace and the National Centre for Alternative Technology have agreed to help. "The Scottish Electricity Board," say SCRAM, "already have at least 20 per cent too much capacity. There is good evidence to suggest that their forecasts of future electricity demand are much exaggerated. In contrast to other countries, there has never been a large-scale manifestation of public opposition to nuclear power in Britain. It is time we showed our strength."

# ECOPOLITICS



electric future" that was so assiduously promoted by organisations with interests in planning, designing and building power plants. The absurdity of forecasting that 90 per cent or more of all energy used will be electric, at some conveniently distant point in the future, was given the sombre stamp of authority in the Energy Mines and Resources Ministry's 1973 document *An Energy Policy for Canada*, with a forecast that by 2050 more than 85 per cent of all energy would be electric, and of this some 90 per cent would be nuclear. As Connerty points out, a lot has happened — at least superficially — to Canadian energy policy since then. Gone is the 1973 euphoria over energy growth rates and Canada's ability to import whatever oil its wastefulness and exhaustion of home reserves should demand, to be replaced by a new political imperative of greater energy supply security in its latest policy *Strategies for Self-Reliance* (1976). But as he makes plain, nuclear energy's punters, chameleon-like, have merely traded their all-out-growth tint for the rich hue of energy independence. CANDU reactors, in vastly proliferating numbers, are now presented as trusty guard dogs that will keep vicious Arab hands from reaching deeper into the pockets of Mr. and Mrs. Joe Citizen. Even in *Strategies For Self-Reliance* (which permits itself some comment on the possibility of declining energy growth rates) Canadians are expected to pay some \$90 billion between now and 1990 to build as much as 25,000MW of new CANDU nuclear power plants.

Connerty details the many solutions to Canada's energy problems that do not involve a single atom being split. Predominantly he argues for a more coherent, generous and committed approach to conservation — which can be so very easily justified on the simplest of investment and employment opportunity grounds — and the "poor cousins" of nuclear energy, the renewable sources. In his paper he argues for a 10-year, \$300 million

research programme for solar, wind, biomass and geothermal energy, to result in a supply from these sources by 1990 that would be equal to projected growths in the nuclear power system as contained in *Strategies for Self-Reliance*.

The 26 recommendations contained in the paper are wide-ranging; but for Canadian nuclear power, encompassing such organisations as AECL, the CANDU building groups, and Eldorado Nuclear (the Government-owned mining venture that strikes uranium, not gold), Connerty has only provided a variety of different coffin nails. Some of his most noteworthy recommendations are:-

1. That AECL be superseded by a universal "Energy Corporation of Canada" to undertake the \$300 million, 10-year programme of R & D into soft energy.
2. That the Canadian Government make vigorous efforts towards exporting renewable energy technologies to underdeveloped nations;
3. That, in view of the insurance companies' refusal to accept the risks involved with nuclear operations, there by immediate proclamation of the Nuclear Liability Act with the Federal Government accepting the full extent of the risks involved;
4. That there be full public access to all internal nuclear documents of the Government and its Crown Corporations or that reasons be given why such documents must be kept secret;
5. That any director of any nuclear corporation be criminally liable if he is found guilty of misleading the Government;
6. That, in view of the fact that some nations have recently lowered radiation standards by as much as a factor of 100, a review of all standards for the definition of "safe" radiation levels should be undertaken;
7. That, in view of mankind's pollution of the global environment which may soon disastrously affect fundamental equilibria of the planetary ecosystem, the Government place a high priority on achieving a viable code of international environmental law;
8. That a new programme of Opportunities for Conservers be instituted immediately with a funding of \$150 million to create

labour intensive employment where it is most needed in Canada;

9. That the Federal Government subsidise 50 per cent of the cost of projects involving renewable energy sources undertaken by the various Provinces, up to a total equal to the subsidy offered for the first nuclear reactors in each Province.

As Connerty's statement makes plain, it is the consumer and the natural environment that always carry the can. If our own energy mandarins' incredible vision of nuclear expansion, for example the Dounreay "atom park", were ever to start becoming real the British consumer would be fleeced directly (through electricity prices) and indirectly (through taxes) in order to generate the funds. And now, because of the reality of North Sea energy, pressure is relentlessly mounting for Tony Benn to decide on which reactor type we must have for nuclear expansion plans that were quietly thrown away after the OPEC moves of 1973 and the world economic recession it triggered. It is unhappily true that to obtain some more breathing space we must hope for a deepening of the European and world recession. This (despite the frothy mouthings of Benn on how "deeply impressed" his Department is with the apparent viability of arguments for conservation and renewable energy as a temporary energy band-aid) is the *only* consideration currently respected by any major politician. Perhaps it is time for our politicians to take a leaf out of Connerty's book — *before* the North Sea Bubble has squirted its last teacup of oil...

Andrew MacKillop

## eco

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# REPORTS

## Vietnam's other war

When Ho Chi Minh declared Vietnam's independence from the French in 1945, millions of Vietnamese were suffering from malaria, tuberculosis, leprosy, polio, typhoid and cholera. Trachoma, a virus disease of the eyes which often results in blindness, was widespread, and parasitic worms like hookworm were found in almost all Vietnamese.

French statistics had shown in 1938 that Vietnam's death rate of 26 per thousand was among the highest in the world. Every year, 30-40 per cent of all the children in the country would die. Today, the picture has changed dramatically. Over the last three decades, the Vietnamese claim to have almost eradicated malaria in the North; "drastically reduced" polio, typhoid, whooping cough, diphtheria and cholera; and cut down the infant mortality rate, perhaps the most sensitive index of a society's health, to 3.3 per cent, a tenth of what it was before. The battle for a disease-free environment has, however, just begun in the South.

In 1945 medical services in Vietnam were hopelessly inadequate and disease was rife. Wisely deciding to rely on their own efforts, training their own people and using their own resources, they now have a rural health programme that could serve as a model for many other developing countries.

In 1945, the country's medical resources were pathetically underdeveloped: just 47 hospitals, nine maternity homes and 100 fully trained physicians (one for every 180 thousand people). Most of this infrastructure was based in the towns, although the people lived mainly in the countryside. Above all, the human environment was so polluted that there was little chance of remaining healthy.

The "faecal peril", as the Viet-



Blood Test for Malaria in a mountain area

namese call it, was particularly intractable. Human excretion was totally unorganised. The traditional water supply was the stagnant village pond which was shared by everyone — from men to buffaloes. But in the Vietnamese peasant's eyes, water was by nature clean. They have a saying: "All dirt is washed off by water".

Developing an adequate health system in these conditions was obviously an uphill task. A key choice had to be made: should Vietnam build up a national system of medicine, essentially by its own efforts, or rely primarily on the assistance of more advanced countries? "We have chosen the first path", said Dr. Pham Ngoc Thach, North Vietnam's first Minister of Health. "It was a political choice, not a medical one".

Experience has proved Dr. Pham right. A Western style system, for example, would have meant that before a doctor could treat trachoma, he would first have to go through several years in a medical college. The Vietnamese found that many ordinary people had a passion for medicine. "After a short course of specific training, they can become good nurses and health workers and give adequate care to patients

suffering from malaria, trachoma and tuberculosis." Hundreds of thousands of surgical operations for entropion — a complication of trachoma in which the eyelids turn inwards — have been conducted by Vietnamese village health workers after only a few weeks of training.

Furthermore, a Western-style hospital-based system would not have destroyed disease at its roots. There would have been no guarantee that a cured person could remain without disease. The old adage "prevention is better than cure" was the obvious answer for Vietnam and this too meant mass mobilisation to control unsanitary practices. The key to their health system, the Vietnamese proudly claim, is a special latrine that they developed in the early sixties, after years of painstaking research. It consists of a dry, airtight double septic-tank; one compartment is in use while the other is topped up with earth when two-thirds full, to compost the faeces into a safe and inoffensive field manure.

The war which has prevailed in Vietnam right since its birth has greatly helped to shape the decentralised structure of its medical system. The war against the Japanese and then the French in the 1940s

and 1950s was fought from the depths of the jungle. It helped the Vietnamese to gain respect for existing traditional medical systems, for locally available herbs, and for cheap, simple medical skills that could be acquired in a short time. The heavy bombings by the US Air Force in the 1960s and 1970s forced Vietnam to extend this decentralised, ever-ready medical aid service, involving as many people as possible — and created a heavy demand for surgeons.

The Vietnamese responded by teaching surgery to every type of medical personnel, including experts in tuberculosis, internal diseases, childcare and eyesight. As late as 1964, nearly all surgical operations had to be done in provincial capitals. By 1966, 90 per cent of the villages in the country had set up their own health centres, where operations were being done in underground operating rooms or in thatched huts with a parachute as a roof.

These thirty years of incessant war also led to a decentralised system of producing medicines. Medical schools, villages and private individuals alike were urged to grow their own herbs. The study of local remedies has produced a large number of herbal treatments for neuralgia, diarrhoea, rheumatism, dysentery and worms like hookworm. Dr. Pham points out that the Vietnamese have been greatly concerned that with increased felling of forests and consequent reafforestation, many wild species of herbs may disappear. The study of the curative properties of Vietnam's plants, and their selection and cultivation is now a matter of priority.

The most remarkable success seems to have been made in the treatment of tuberculosis. The Vietnamese have found that the live "BCG" vaccine is very difficult to use on a mass scale, since it needs refrigeration. By 1955, the World Health Organisation had abandoned the attempt to produce a vaccine with dead BCG, even though a dead vaccine does not need to be kept cool. The Vietnamese, however, persisted with their research. Finally, in 1960, they found that if the BCG vaccine was kept at 43°C for one month, it gave the same immunity as live BCG — and it no longer



Community Health Centre in the mountain region

needed refrigeration. By 1971, some 20 million vaccinations with dead BCG had been done in Vietnam, with extremely good results.

The BCG vaccine prevents people getting TB in the first place. But what about people who already have the disease? The standard treatment is a combination of three drugs: INH, PAS and streptomycin. In Vietnam, this proved effective but costly, and special care was needed by village-level doctors, as streptomycin can cause deafness. So the Vietnamese tried abandoning streptomycin and PAS and combining INH with injections of placenta extracts — a treatment which had proved very successful against a variety of infections in the underground resistance against the French. But this did not work against TB, until one day a practitioner of traditional medicine suggested that the injections of placenta extracts be given at the point where the traditional needles of acupuncture are inserted to treat the lungs. The method was so effective and easy to handle by village-level doctors that tens of

thousands of TB cases have since been treated with it.

The Vietnamese medical system is, therefore, marked by its efforts to mobilise every possible resource and to harness the self-help capability of the people. It is organised virtually on a war-footing, which may be the prime reason for its success. In the developing countries of Asia, Africa and Latin America, where 200 million people are affected by schistosomiasis, 200 million by malaria, 500 million by trachoma, 300 million by filariasis, 20 million by leprosy, and another 50 million by tuberculosis, this is probably just the way that health services need to be organised — as if the entire Third World was fighting a war.

Anil Agarwal

Reprinted from EARTHSCAN 1977.

\* The Bertrand Russell Peace Foundation has published a collection of articles: *Health in the Third World: Studies from Vietnam*, edited by Joan K. McMichael, UK 1976.



# REPORTS

## Risky Analysis

Risk Analysis — RA — is supposed to be a new and effective tool to guide policy-makers in the complexity of modern technology. In general it is not used to investigate a random selection of the possible or probable calamities that may result from a certain technology, but in order to lend an air of respectability to the proposals of a specific interest group. The possibilities of manipulation are inherent in the system, just as they are in the area of cost-benefit analysis. A typical example of this is that of the estimated costs of a KWh- of nuclear electricity, which ranged from five hundred dollars to twelve hundred dollars depending on the expert who did the calculation and the group he was working for. Although one may hope that sincere and objective researchers are involved in any particular project, the self-serving bias cannot be ignored and must therefore influence the public response. Because collected data can be arranged to favour certain preconceived goals, RA is always suspect.

The famous Rasmussen RA report on the safety of nuclear power showed that there is a far greater risk of people being killed or maimed in a car accident or an airline crash than as the result of an explosion in a nuclear power plant. This report was well publicised throughout the world and led to enthusiastic headlines in the press: "Nuclear Power Proven Safe!!" and so on. The nuclear industry expected it to have a reassuring effect resulting in public support for their programmes. This did not happen. On the contrary, in most western countries opposition to the nuclear power industry has actually increased, which is very puzzling to those who believed in the objectivity of the Rasmussen report.

The explanation is to be found in what one might call the *diversity of social response*. Every social group has its own goals and values which may not necessarily coincide with the goals and values of other groups.

Thus to one group, in this case those involved in the development of the nuclear industry, the one-in-ten million chance of a nuclear accident looks small and is a reasonable risk. To a second group who object to the siting of a nuclear plant in their neck of the woods, the one in ten million chance is irrelevant; if it is even possible that an explosion might ever take place they do not want to take that risk. A third group might be politically motivated. Their interpretation will be dictated by what they expect the electorate to require from the report. As a general rule each group will regard its own interpretation of the given data as the *only* right and logical one, and will disregard the views of those who see it differently, thus RA contributes to the general unease about technological secrecy.

A famous Dutch mathematician once said: "A wise judgement contains no logic". To most of us this seems a dangerous idea. We are educated in a Cartesian logic-system which teaches that we can understand the whole by analysing the parts. As a result of that assumption

RA is supposed to guide policy-makers in complex areas of modern technology; attitudes to risks depend largely on the way they are assessed, but if the wrong questions are asked the answers can be used to give an untrue overall view.

tion we select our criteria of logic based on our own intellectual stance. We therefore find it difficult to follow the logic or accept the values of a system that does not conform to our own. It is idle to expect that all groups in a plural society will be able to subscribe to a single interpretation of any given data.

Clearly there are as many truths as there are groups in society, and when the members of a group feel threatened they cling ever more tightly to their own interpretations. To defend their truth against the doubts or distortions of others they resort to an almost ritual use of pseudo-scientific words — *validation, evaluation, proof, analysis* and so on. In public debate they no

longer speak of their faith, their hopes and fears, but of their *analysis*. The result is a celebration of their own truth, leading to barriers that cannot be easily overcome. One result of this process is that RA is often regarded as a reinforcement used by a specific group to overrule the objections of other groups. In this situation RA promotes a sort of group warfare.

In the Rasmussen report it was assumed that the political and social stability essential for the maintenance of a nuclear power system obtains all over the world and will last for ever. This is not true, and is unlikely ever to be true, therefore the RA methodology is incomplete. Further, in the Rasmussen report it is calculated that people are more likely to die from motor car or aircraft accidents than as a result of nuclear failure. This is the wrong comparison: the kind of comparison that should have been made would have asked the question 'How great a chance is there that as a result of a car or aircraft accident three hundred people will die instantly, ten thousand more within three months and that the event will leave behind 1000km<sup>2</sup> of toxic land for at least five hundred years?' Not the *causes* but the *effects* should have been compared. Without such analysis the calculations lose their credibility.

When society realises that the wrong questions are being asked it feels threatened. Just as the stress factor in concrete is limited, so is the stress factor in societies; just as metals can suffer from corrosion, so too can societies. Grand designs may dazzle the eye, but if there is the tiniest flaw in the calculations disaster may follow their execution. So it is with societies. Those who apply RA can accrue short term advantage, and many decision makers do indeed believe in ritual 'figure fetishism' — but Government and industry cannot hoodwink the public for ever, and when it rebels the protest will be enormous and disruptive, witness the demonstrations now going on the world over, against the proliferation of nuclear power.

Wouter van Dieren

# REPORTS

## Malawi- a nation of Conservationists

by  
Wayne Linn &  
Anthony Netboy



Dr. Hastings Banda

Malawi, formerly Nyasaland, is a small landlocked country of some five million people of whom over ninety per cent are Africans, the rest are Indians and Europeans, mostly British. It is also a poor country the greater part of whose population are small subsistence farmers. There are some large agricultural estates owned by Government or local firms, that produce tea, sugar, tobacco and groundnuts for export.

Although ownership of land is mostly communal, nearly every family has the right to cultivate its own small plot of some four or five acres, where enough food is produced to sustain a family and provide something extra to be sold for cash to buy a few essentials; household goods, clothes, tools and so on. The people are true conservationists for they have to use their resources wisely to survive.

Dr. H. Kamuzu Banda, Malawi's Life President, was educated in the US and lived for several years in England before returning to lead his people in the bloodless revolution that resulted in their gaining independence in 1964. In spite of his reported admiration for the American way of life, Dr. Banda is keenly aware that the Western industrial system is not suitable for his people and that the good life cannot be attained by industrial-

isation and mechanisation. He is not anxious to follow the mistakes of other Third World countries by driving his own people along the road that leads to dependence on a cash economy. Although thousands of Malawians go to work in the mines, or on the large agricultural estates of Rhodesia and South Africa, on short term contracts, the aim of the Government is to provide work for most of them at home. The economy is thus based on labour intensive rather than capital intensive activities. Cottage style industries are encouraged because they keep people gainfully and meaningfully employed.

Because it is blessed with good soil and adequate water supplies, Malawi is able to feed itself despite the fact that it is rated one of the poorest twenty countries in the world in terms of per capita cash income. Over ninety per cent of the families are cultivators and only five per cent of the population live in urban areas. The main crop grown for their own consumption is maize; cassava, rice and vegetables are also grown for sale. Hand tools in the form of the panga knife and hoe are standard equipment and oxen are used as draught animals. There are no horses and very little machinery. Pecuniary incentives are relatively unimportant to the

cultivators except to satisfy basic needs. Thus a survey carried out by the Ministry of Agriculture revealed that in the cotton picking areas the growers tended to stop picking as soon as they thought they had made enough money to take care of their cash needs. The rest of the crop is left unpicked.

The diet of most Malawians is based on the food they produce, supplemented by the purchase of, for example, tea, sugar and salt. Fish and vegetables add variety to the basic food a porridge made from maize; meat is scarce and eaten only on specific occasions. Food distribution patterns are the traditional peasant type found in other continents. Markets are in the open and here the local growers and other small merchants bring their wares by bus, if they live some distance away, or by bicycle and on foot. There is a wide display of locally grown foods, but few packaged or processed items. Shoppers bring their own baskets for their purchases, and only meat and fish are wrapped. Investment in shops, processing, packaging and transport is minimal and thus the cost of food and other commodities is kept down.

An important feature in market towns is the availability of used items like cardboard boxes, cement bags and glass containers and



bottles. Used wood from construction sites can be bought for firewood. Frugality is the essence of the Malawi way of life. Not a kernel of rice or maize is wasted. Not a bone or a lettuce leaf is thrown away. If a bag of maize is accidentally spilled on the dusty ground a group will gather round and pick up every scattered grain.

The use and re-use of commodities not only stretches the supply but eliminates one of the major problems of an affluent society — the disposal of wastes. It also largely eliminates the nuisance of litter: things are too precious to be thrown away. Cans, containers and paper do not lie in the roads, nor do waste pieces of metal, broken glass or bent old nails and motor tyres. Some use is found for them all. At the saw mills the trimmings and shavings are used for fuel. Wood is the main source of heat for cooking and around some of the cities, as in Lilongwe — the new capital — forest plantations have been established to provide a permanent source of fuel wood.

Candlelight or kerosene lamps are the common form of illumination. There is little electricity owing to the limitations of the supply and distribution system; where possible man-power is preferred to mechanical power. The chain-saw, that ubiquitous tool that is rapidly deforesting so much of the western world, is not seen here. An example of their reluctance to use power-tools is seen around the public building in Lilongwe where a battalion of young men cut the extensive lawns with the traditional panga knife. Because of the wide use of domestic resources and the refusal to mechanise on a large scale there is no energy crisis.

Malawi has no known source of petroleum and its mineral output is confined to the quarrying of stone, limestone and other building materials. Unlike Israel, which is a country equally deficient in natural resources, especially cultivable land, which strives to attain a standard of living comparable to that of the US, Malawi does not rely heavily on

imports which can only be paid for by a manufacturing industry or by loans from abroad. Restrained in its dependence on imports, self-sufficient in food Malawi has so far avoided selling its present independence of world markets for the promise of future affluence.

The net impression we got from a long stay in Malawi was of the sense of respect and reverence the people have for the resources that nourish and sustain them, and especially a high regard for the human resource. Although we in the West cannot turn the clock back to the halcyon pre-industrial days of our forefathers, there is much we might learn from the Malawians. They strive to live in harmony with nature and avoid the pitfalls of increasingly substituting machines for human labour. While they are not rich in material goods they are not intimidated by western ways for they have a richness of living that most of us miss.

## Gruesome threat to rare gorillas

Although the poaching of gorillas in the Virunga Volcanoes of Rwanda and Zaire has long been suspected, it was in the first days of this year that incontrovertible proof of an illegal traffic in dead gorillas was established. In January the mutilated and headless body of *Digit*, a young male gorilla who had been well known to Dr. Dian Fossey and her team at the Karisoke Research Centre since his infancy, was discovered. It is now known that he was stabbed to death by poachers and that at least ten other gorillas have been killed in this way. The gorillas' heads and hands are taken to be sold for a paltry sum equivalent to twenty dollars, to provide gruesome trophies for Westerners, both residents and tourists, in the cities around the park.

With possibly fewer than 250 gorillas left in the park, this new threat to the population is extremely grave. When Virunga National Park was established in 1925 one of its main purposes was to provide what may be literally the last refuge of *Gorilla gorilla berengei*, the rare

Mountain gorilla. The park lies across the borders of Rwanda, Zaire and Uganda and encompasses the six extinct volcanoes of the Virunga mountain chain. Because the altitude varies from about 2,120m to 4,150m, it includes a wide variety of vegetational zones, suitable for a great diversity of animal species. There used to be



more. Poachers have already contributed to the total eradication of elephant and leopard from the park, besides taking quantities of buffalo and antelope for meat. The threat to the gorillas is the more grave because this is the only area where they survive in any number, and that is fast dwindling. In 1959 the estimated population was between

400 and 500. By 1973 it had fallen to between 300 and 350.

In recent years the park has lost 2,500 hectares (from a total of 500 km), to the UNIDO pyrethrum scheme, while the need for cattle grazing land and firewood contribute to its erosion. This, together with the impossibility of adequate patrolling of an area that includes national frontiers adds further to the survival hazards of the gorillas. It takes a female gorilla in the wild eight years to reach breeding age, and for males it is some years longer. Time is not on their side. In this situation every death counts. It is therefore vital that the culprits — the foreign buyers — be stopped in this despicable trade.

To aid the Rwanda Government in their efforts to stop further slaughter it is intended to start a MOUNTAIN GORILLA FUND. The Fauna Preservation Society has agreed to receive donations for the time being. Cheques made out to: Mountain Gorilla Fund should be sent to The Treasurer, Fauna Preservation Society, Regent's Park, London NW1.

(Compiled from information supplied by A.H. Harcourt Esq.)

# GLEANINGS

## Oh, What a Lovely Report!

The Keep Britain Tidy Group has joined forces with the Buckinghamshire College of Further Education to produce a report 'Discarded Containers on a Kent Beach' (A Kent beach, please note, no mealy-mouthed generalisations here). *Pollution*, the monthly digest, comments that it 'makes a valuable contribution to knowing [sic] the effects of pollutants in the marine environment.'

Certainly it is full of indispensable material for marine ecologists. What fresh insights they will have when they know, for example, that 'in a sample of 2,950 containers removed from 1.6 km of shorelines, 1134 were plastic, 960 glass, 739 metal and 117 paper'. That the most common items were lavatory cleansers and that analysis of 429 of these indicated that 87 per cent of them were less than three years old at the time of recovery. How controversial is the revelation that 'surface floating containers

respond very markedly to the action of the wind'. This, believe it or not, is because floating bottles are 'subject to the stress of the wind moving the surface layer of the sea'.

The report, carried out incidentally during periods of onshore winds in the winter months took (only) three years to produce and concludes that 'the diverse range of geographical origins of plastic containers suggests the source of discard to be shipping passing through the Straits of Dover,' and notes that 'enforced and improved waste disposal practices at sea would be effective in reducing inputs into the marine environment'. Who would have thought it?

The authors, Trevor Dixon, a lecturer in Environmental Studies, and his assistant, Joy Cooke, recommend that similar studies be carried out elsewhere to establish a base-line from which 'future trends in composition or abundance of containers' can be evaluated.

## Cotton Mill Picket

When Dr. Bouhuys of Emory University in Georgia sought to study Brown Lung disease in cotton mill workers, he was barred from every private mill in the state. A secret memorandum to mill owners from the executive vice president of the Georgia Textile Manufacturers Association urged them to keep the researchers out and to pressure Emory trustees to block the study. In 1969, Dr. Peter Schrag was similarly blackballed — although he eventually got into a mill on condition that he kept his findings secret. Those findings — a 12 to 29 per cent rate of brown lung in the mill — were eventually published. Shortly afterwards, Schrag lost his job with the North Carolina Board of Health.

Current federal standards set the maximum permissible exposure to cotton dust at 1000 micrograms of total dust per cubic metre of air. The Occupational Safety and Health Administration has proposed lowering the maximum to 200 micrograms. Textile industry representatives have proposed a 'compromise' of 500 micrograms. Yet research has shown that even at 200 micrograms, some 13 per cent of cotton workers would still contract brown lung. A breathless example of double standards.

*Weekly People*, 13.8.77

## Frozen Assets

The idea of towing icebergs around the world to supply water to arid lands was first touted in the 1940s. Nobody took it seriously. Thanks to a conference held last October at Iowa State University, however, icebergs have gained a new popularity — rivalling even that of space colonies. Overnight they have been hailed as the solution to the world's water crisis.

Not that the project isn't fraught with problems. How after all does one transport a hulk of ice half way around the world? Simple, says Prince Mohammed Al-Faisal of Saudi Arabia (a prime-mover of the scheme), you mount paddle wheels on the side of the 'bergs'. Alternatively you can propel them by osmosis, using the salinity ingredient. The thorniest question predictably perhaps, is how to stop the icebergs melting and breaking up en route. If you tried to tow an unprotected iceberg to Arabia or Southern California 'you would end up with nothing but a tow line', said Wilford Weeks of the Army Cold Regions Research Laboratory. Not to worry, said Abdo Hussein, an Egyptian Nuclear Engineer, you just wrap the iceberg in a plastic sheet or spray it with urethane foam (apparently the water in its virgin form is unpolluted). As for the last hitch, that of piracy, the conference was assured that matters were under control: Lloyds of London has offered to insure the icebergs against any latter day

Jolly Rogers. At a cost of 30 million dollars to take each plastic covered iceberg on a nine month trip to California, it must be cheap at the ice.

*Science*, October 1977

## Green Light for Ecologists

The latest opinion poll to be commissioned by Eurobarometer reveals that 78.5 per cent of Europeans have 'positive feelings' towards the Ecology Movement. Top of the ecology list, with 94.5 per cent, was Denmark. In second and third place were Luxembourg and Belgium. France only managed seventh place, despite the great gains made there at the last elections by Ecology candidates. The Ecologists came off worst, surprisingly perhaps, in green Ireland.

In France, a poll by *Le Nouvel Observateur* showed 38 per cent of Frenchmen thinking that the problems raised by Ecologists were 'top priority'; 34 per cent thought them 'very important'; and 40 per cent found them 'no more important than other problems'. The poll also revealed that 4 per cent of the population were committed to Ecological candidates.

*Euroforum* 17.1.78 and *Nouvel Observateur*, January 1978

What is your opinion of the Ecological Movement?									
	% Belgium	% Denmark	% Germany	% France	% Ireland	% Italy	% Luxembourg	% Holland	% U.K.
Very Favourable	46	70	29	25	19	32	63	42	23
Quite Favourable	33	25	50	56	45	46	28	32	49
Unfavourable	7	2	10	9	16	9	4	10	13
Very Unfavourable	2	1	*2	3	5	3	1	3	3
Undecided	12	2	9	7	15	10	4	3	12
Total	100	100	100	100	100	100	100	100	100

Poll conducted by Euroforum: Oct-Nov 1977



## Nothing to Worry About

"Since this paper was delivered the salt water leakage into the two reactors at Hunterston B has occurred. The Chairman of the South of Scotland Electricity Board has stated, however, that this was due to human error and not to any design weakness in the plant".\*

Clearly the time has come to eradicate the human beings.

\*Footnote to 'Nuclear Energy Prospects' by Dr. P.M.S. Jones  
ATOM. February 1978

H. M. Govt. Health Depts' WARNING: CIGARETTES CAN SERIOUSLY DAMAGE YOUR HEALTH. MIDDLE TAR
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H. M. Govt. Health Depts' WARNING: CIGARETTES CAN SERIOUSLY DAMAGE YOUR HEALTH. MIDDLE TAR
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H. M. Govt. Health Depts' WARNING: CIGARETTES CAN SERIOUSLY DAMAGE YOUR HEALTH. MIDDLE TAR
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## Pipe Dreams

The government's justification for its refusal to place an outright ban on the advertising of cigarettes is a hybrid between Jesuit sophistry and Alice in Wonderland, writes Lawrence McGinty in the *New Scientist*. Ennals, for example, argues that a ban would be 'an unnecessary restriction on the liberty of the individual'. Moreover, it would detract from the strategy of persuading people to move to lower tar brands (because they would not know what brands have low tar deliveries) and would 'remove an important vehicle for the health warning'.

Nor is the government to make the warning label on cigarettes more forceful by amending the current wording, 'Cigarettes can seriously damage your health' to 'Cigarettes cause lung cancer, bronchitis and heart disease'. Why? Because, Ennals says blandly, more forceful wording is 'unacceptable to the tobacco industry'.

*New Scientist*, 22/29 December 1977

## A Desert is a Desert is a Desert . . .

Just in case the participants at the UN Desertification Conference last July were at sea about what constitutes a desert, the Senior Programmes Officer for the conference, Boris G. Rozanov, was kind enough to offer a succinct definition for them in *Ceres*, the official organ of the FAO. "The definition of desertification, which is adopted for the purpose of this conference," he said in an interview, "may be a bit different from that found in the literature because there is scientific disagreement on desertisation and desertification. We have adopted

the broad definition accepted by the General Assembly Resolution 3337 (XXIX) adopted in 1974, which explains it as the spread or intensification of desertic conditions. Desertic conditions are conditions of deficient moisture expressed in sparse or absent vegetation, primarily due to inadequate rainfall. And these conditions also relate to the low biological productivity." Might one be forgiven for taking this to mean that deserts are simply deserts?

*Ceres*, March/April 1977

# NUCLEAR NEWS: NUCLEAR NEWS

## No Conflict?

It is usually difficult to define 'conflict of interest', but when a Federal Government's chief expert on the safety of nuclear reactors is also the consultant to five commercial companies in the nuclear field, three of them licensed by the government itself, it seems safe to say that there is indeed a conflict.

The consultant is Dr. Norman Rasmussen, author of the widely cited *Rasmussen Report* on the statistical chances of a nuclear accident. Rasmussen and others were the subject of a study in 1976 into the employment backgrounds of top officials in the Energy Research and Development Administration and the Nuclear Regulatory Commission undertaken by Common Cause.

Among the findings:

- \* 50 per cent of top ERDA employees came from private enterprises involved in energy activities: 75 per cent of them from companies under contract to ERDA.
- \* 67 per cent of top NRC employees came from private businesses involved in energy: 87 per cent of them came from firms and universities holding licenses, permits or contracts from NRC.

\* 88 per cent of NRC's consultants who are university professors or employees from other non-profit research organisations came from institutions regulated by NRC.

*Environmental Action*, 11.7.76

## The Plumbers

Who has a pistol, a shotgun, sophisticated camera equipment, finger print kits and drug analysis kits? Who has a disguised company car complete with changeable headlights and rear-lights to confuse someone who is being tailed or is doing the tailing? Who compiles files of questionable accuracy?

It's not the star from the latest television spy drama, it's the Georgia Power Company's nuclear snoop squad. Sources told *The Atlanta Journal* that throughout most of its four-year existence, the power company's security department has collected files on people considered subversive. Information for the files has been gathered from several sources of disputed integrity. The security force was formed, Georgia Power claims, due to con-

cerns for safeguards at nuclear facilities.

*Critical Mass Journal*, Nov. 1977

## No Arms for California

Governor Jerry Brown of California has refused to sign a bill which would have brought California law into line with federal regulations which require that security guards at nuclear facilities carry guns. 'If nuclear power plants aren't a problem,' he said, 'why do they need 24 hour guards?'

## Anger & Grief

Anti-nuclear feeling among the Basques has been inflamed by the death of twentyfive year old David Alvarez Peña, who died some weeks after being shot by the Spanish Para-military police. With three friends he was responsible for a hand-grenade attack on the nuclear power station at Lemoniz near Bilbao. Crowds estimated at over ten thousand have turned out at demonstrations of sympathy and solidarity in the cause against nuclear proliferation.

# NS: NUCLEAR NEWS: NUCLEAR

## Spills Inevitable

"As far as I know," bellowed the Exxon representative as he scanned the landscape, "this is the largest spill we have ever had." Spread before him, over a five thousand square foot area, was 10,000 lbs of radioactive uranium concentrate. In places the material, a powdery substance, was as much as a foot deep.

The spill, in South Eastern Colorado, was nearly the 250th truck accident since 1971 to involve radioactive material. The accident occurred when three horses ran in front of a truck carrying 40,000 pounds of radioactive material. It took twelve hours before any professional health specialist arrived on the scene, and even then, the wrong equipment was sent to decontaminate the area.

Earlier, near Vermont, a truck carrying spent radioactive resins from the Vermont Yankee reactor station also crashed. It was the second time in two years that a truck from the plant had been involved in a collision. A spokesman for the Vermont Yankee facility told local reporters that traffic accidents are 'an inevitable result of the transportation of nuclear material.'

*Critical Mass Journal, Dec. 1977*

## Explosion at a Plant Injures Man

An explosion jolted a door off a building at a nuclear power plant in Connecticut last December. One man was injured and an indeterminate amount of radioactive material was released. A utility spokesman said the incident did not pose a public health hazard. The Millstone Point plant, where the explosion occurred, had to be shut down.

*New York Times, Dec 15th 1977*

## Ecologists Sit-in

Ecologists, protesting against the town council's silence over five accidents at the local nuclear fuel plant at Tricastin, S. France, occupied the town hall last December. On November 25th 1977, several tonnes of uranium-hexafluoride were released into the atmosphere above the plant. Following the accident, 400 people, heeding the call of a local ecology group, demonstrated. Representatives from neighbouring councils joined in.

*Sauvage, Jan 1978*

## Wise Move

Opposition to nuclear power is now international. Its spontaneous eruption world-wide is powerful evidence of the reaction amongst people of all walks of life to our technocratic society. But whilst, nationally, groups have co-operated in their efforts to halt the nuclear bandwagon, there has been, to date, little contact between groups internationally. This, say the organisers of WISE (World Information Service on Energy) is to the detriment of the cause, and puts the nuclear establishment in a powerful position: they operate within government circles, have access to all the publicity sources they need, and can rapidly exchange tactical and statistical information to further

their case.

'It is high time', says WISE in a press release, 'for the movement to organise a flow of information and experience that can enable its actions to be more effective and better co-ordinated.'

The prime aim of WISE will be to ensure that all the relevant information is speedily available to those who need it; the material for legal and political presentation of the anti-nuclear case, the practical details of working alternative energy schemes, the data on the impact, the dangers and the problems of the nuclear industry, and so on. A meeting is planned for February to finalise details.

## Nuclear Fire Tests Fail

The Union of Concerned Scientists have filed an emergency petition before the US Nuclear Regulatory Commission calling for the shut-down of most of the USA's 65 nuclear reactors and the suspension of all construction of new plants. The emergency petition was based on an internal NRC memo reporting that the current fire safety systems failed to operate adequately when tested at a Sandia Laboratory in New Mexico last July. Since the petition, the NRC has shut down Unit I of the Cook Nuclear Reactor Plant near Benton Harbour, Michigan. The reactor will not resume

operation until 'properly qualified electrical connectors are installed in all safety-related systems required to perform under accident conditions'.

*Critical Mass Journal, Dec 1977*

## Drowned?

An Indian heavy water factory at Baroda, 300 miles north of Bombay, was partly destroyed early in December last year, by a series of explosions following a fire. More than twenty people were injured as a result.

*Sauvage, Jan 1978*

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## Books

### Teacher with a Four-Dimensional View

BRING ME MY BOW by John Seymour. Turnstone Books, £1.95. THE COUNTRYSIDE EXPLAINED by John Seymour. Faber, £4.95.

John Seymour has presumably taken the title of *Bring Me My Bow* from Blake's *Jerusalem* — a surprising choice, for Mr. Seymour's closest affinity is surely with Blake's saner contemporary Cobbett. Like Cobbett, he is not an intellectual or an ivory-tower idealist, but an essentially practical man with plenty of English common sense, a strongly idiosyncratic philosophy of life, and a forthright, rather conversational style. As with Cobbett, the writings are the man — energetic, quirky, opinionated, full of reminiscence and anecdote, adept at devising memorable catch-phrases, quick to nail down a generalization with a concrete instance from his own, or everyone's, experience. Like Cobbett, again, he is a man of essentially conservative temperament driven into a radical stance by the logic of his opposition to the "progressive" forces of his time. *Bring Me My Bow* is the nearest thing to a political manifesto that John Seymour has yet produced; it is a short book, and there is not a sentence in it which would be unintelligible to the average sixth-former. (Rare virtues in an age when verbosity and obscurity are often mistaken for wisdom.)

The essentials of John Seymour's philosophy are those of *The Ecologist*. He advocates breaking down nation-states into "the natural groupings of mankind" — Wales, Yorkshire, East Anglia: devising a new economic science in which values other than money are given

their true weight: reducing trade to the import of products a region could not possibly produce for itself. He would cut military expenditure by depending on citizen levies on the Swiss model, and health expenditure by giving everyone a diet and life-style close to the one the human organism evolved to fit. The sturdy independence which is Seymour's hallmark comes over especially strongly in his fulmination against the planning laws, those "Nanny Knows Best" regulations which prevent a man from building a house for his family on his own land, or using his own premises to start a village industry in an area of high unemployment. At the same time any rich businessman is free to buy a "second home" which could have saved a country family from drifting to the bed-sit squalor of the cities. "Ill fares the land . . . where wealth accumulates and men decay". The Seymour solution to most of our problems is the peasant one — self-sufficiency combined with passive or not-so-passive resistance to the demands of the centralist state. A friend of his in Suffolk was called to the door to meet a man who announced that he was from the Inland Revenue. "Don' belong to it!" snapped the old countryman, slamming the door in his face.

In *The Countryside Explained* John Seymour has written an introduction to rural matters for townsmen or the new generation of country-dwellers. He deals with many topics — the history and present state of agriculture, animals and plants wild and domestic, geology, buildings, land and water transport, and many more. Inevitably, therefore, this is a book for the non-specialist: but Mr. Seymour is an excellent teacher, and should whet any reader's appetite. It is a pity he did not include a list of books for further reading; I can imagine someone whose interest in, say, geology was awakened by the 12-page summary here losing heart in a subsequent search for more detailed but equally entertaining material.

Naturally this is more than just a textbook: the writer's prejudices show through, and it is right that they should. But he does not censor his material; he describes modern agricultural practices fairly object-

ively, though leaving one in no doubt where his own preferences lie. And he has the four-dimensional view so necessary to the understanding of the countryside — he sees the present in the light of the past, and tries to look into the future too. As an example of the long view, I like his proposal for *forest-ley farming*, "the afforesting of land, harvesting of the ripe crop of trees perhaps a century later, some decades of arable and grassland farming, then afforesting again." (He slips *that* idea into a discussion of Neolithic slash-and-burn agriculture.) Perhaps the best thing about John Seymour is his *optimism*: he shows that it is possible to deplore our present mess without losing hope for the future. He really believes that things are, however slowly, moving our way. And of course his own life-style is a sufficient proof that his version of the future really does work. With a pen in one hand and a plough in the other, so to speak, may he long continue to show us all the direction in which true progress lies.

Nicholas Gould

### Poor Little Rich People

THE PICTURE OF HEALTH. Erik P. Eckholm, W.W. Norton & Co. Inc. New York, \$3.95

Erik P. Eckholm of the World-watch Institute reports on people who have too little to eat. In most populations there are some in this class, but the F.A.O. lists forty-five nations where the average daily intake does not exceed 2,000 calories, roughly two thirds of the recommended daily allowance. The author's survey extends to affluent societies where the diet contributes largely to the high incidence of heart disease, diabetes, degeneration in age and so on. This is a good starting point. Right nutrition is fundamental to good health. The pity is that the British Department of Health sticks to sums in which nutrients are put together by adding machines, thereby losing sight of *food* as opposed to nutrients, which are seen to be health-promoting.

Our environmental needs go well beyond food — they include such things as adequate supplies of clean

water and pure air. It is estimated that 1.2 billion people on this planet lack sufficient pure water. Contaminants in the atmosphere come from factories, cars, aerosols, supersonic aircraft and so on. We oblige our environment to accept what we cast away, and in spite of this we still expect it to serve our needs. These problems of pollution are examined in detail, and one villain in particular receives a chapter to itself — the vile weed, tobacco.

Just as good health derives from our environment, disease results from its abuse. It is fashionable to seek the causes of disease, not in the whole web of life, but in those precise agents or vectors so beloved of the statisticians, who like to isolate a precise cause for a labelled condition. This, as Erik Eckholm shows, ignores the social causes and stress factors that underlie so much modern disease. In his review of cancer as a social disease he follows the incidence of this disaster around the globe and remains bewildered.

Our factory floors, as well as the fields where pesticides are used, provide new ranges of chemicals to pollute the environment and threaten not only our own health but our ability to reproduce. As we modify our environment we unwittingly favour other species. For example there has been a population explosion amongst the snails that host the bilharzie or schistosomiasis parasite. The snails are thriving as the result of the opening up of vast waterways in tropical countries where the dry season previously controlled the population. This is one example among many that Eckholm cites. There are others that he omits such as river blindness, (onchocerciasis), which has depleted certain African river valleys of human inhabitants. The present drive of highways through Brazil has picked up an isolated pocket of the same disease and has spread it throughout the country.

The author recognises the necessary incompleteness of his survey. Such matters as alcoholism and mental disease do not appear. However the narrative is lively and the thesis that much disease results from the abuse of our environment is well demonstrated.

Kenneth Barlow

## Ecological Information Centre Proposed

**THE SANE ALTERNATIVE:** Signposts to a Self-fulfilling Future, by James Robertson. Available from the author at 7, St. Ann's Villas, London W11 4RU. £1.50 (+30p p & p).

If James Robertson succeeds, *The Sane Alternative* will serve as a kind of information bomb, helping to initiate a nationwide process of discussion and reflection regarding the future of our society; its five chapters will provide the basis for innumerable five-module courses, tailored to the needs of diverse groups within the population: housewives, manual workers, bank managers, the young. If the next thirty years are to be, as Robertson believes, a turning point for industrial society, it is important that there should be public awareness of the issues involved: "In general, if we leave the experts to think about the future for us, we thereby choose a certain kind of future — a future dominated by experts."

More specifically, unless public apathy is dispelled, the most likely of the five alternatives outlined in the first chapter is what Robertson calls TC: the Totalitarian Conservationist Future. In fact, the five scenarios described are not strictly independent. Business-As-Usual leads naturally on to TC: by deferring action indefinitely, government ensures that there will arise a state of emergency sufficient to justify seizure of absolute powers and the suspension of democratic processes.

Robertson's own preference is for a de-institutionalised, decentralised, low-energy future which has a place for self-reliant and self-determining local communities. In considering the transformations that will be required if such a vision is to be realised, he does not neglect changes in values and intellectual outlook. ("Changes in ideas and changes in activity are related to one another as chickens are to eggs.") However, rather than merely talking of paradigm shifts, he is intent on promoting them.

James Robertson's personal project, outlined in the final chapter, is the development of an information clearing house that will enable those working for a stable, ecologically sound society to coordinate

their activities; the hope is that, if sufficient momentum can be generated through cooperation and mutual encouragement, the future will be self-fulfilling in the way that a prediction may be self-fulfilling. (Of course, it is also to be a future in which the self is fulfilled.) An appendix gives a preliminary list of useful contacts, proceeding alphabetically from Peter Abbs to Bob Waller, and the author anticipates that, by publishing the book himself, he will be able to enter into more direct relations with his readers than is usually the case. (Future editions will be revised in the light of the comments that he receives.)

This is a book that must be judged not only by its contents but by its consequences. James Robertson recommends that in setting a value on enterprises of this kind we should always be critical of ourselves and sympathetic to others, and it would seem less than just to do otherwise than accept his suggestion.

Bernard Gilbert

## Farmers or Vandals?

**CLIMATE, WATER AND AGRICULTURE IN THE TROPICS** by I. J. Jackson. Longman, £3.75 (paperback).

**CONSERVATION AND AGRICULTURE** edited by Joan Davidson and Richard Lloyd. John Wiley & Sons Ltd. £12.00.

Nature has no farmers. As soon as man turns the soil and starts to cultivate crops and graze livestock the natural balance is altered. What happens then depends mainly on the skill with which farmers manipulate the resources and forces that become their stock in trade. Eventually, after generations, people acquire a more or less intuitive understanding of their immediate environment.

This understanding is easily disrupted when new methods are introduced more rapidly than recipient cultures can absorb them and the risk of disruption is greatest where innovations originate in a different part of the world. The history of well meaning attempts to establish in the tropics farming techniques developed in temperate climates is littered with catastrophic failures. All of the failures were



caused by underestimating the differences between temperate and tropical conditions.

The difficulties are described clearly and in detail by Dr. Jackson, who writes carefully and economically about matters with which he is very familiar. His *Climate, Water and Agriculture in the Tropics* is written for serious students of tropical agriculture and takes them step by step from an initial examination of the general hydrological cycle to those farming techniques that are most likely to succeed or fail.

This book is bound to become a standard text for students of geography and for anyone studying tropical agriculture, and it is well fitted for that purpose. Dr. Jackson supplies maps, diagrams and graphs, as well as enough statistical data to help him illustrate his points and, most important of all, his rather condensed style can be expanded with the aid of the full references he supplies.

If the eroded tropical hillside is a cliché, so, too, is the European "barley baron" driving his Bentley through thousands of acres of arable desert. He exists, of course, and *Conservation and Agriculture* is written about him and for him. I doubt whether it will make much impression.

The book consists of twelve essays, by different authors, all dealing with the impact of modern farming in Britain on the natural environment and with ways the worst of its effects might be ameliorated. The first seven essays describe the environmental effects themselves, and although they contain nothing that is really new, at least they bring together in one place many strands of argument and produce the facts that support them, so that they may provide useful "ammunition" for conservationists. The remainder of the book outlines the controls that exist or that might exist to protect landscapes and wildlife and then makes many suggestions for ways in which farmers could provide better habitat areas on their farms.

Yet overall the book is not convincing. It states, repeatedly, that countryside which looks attractive to the nature lover may seem untidy and unproductive to the farmer:

conservation of nature, it implies, has little to do with good husbandry.

It is not until the very last paper that Ms. Davidson mentions Prof. Mellanby's view that farming could be modified to supply adequate food and a rich and beautiful landscape. Ms. Davidson dismisses Mellanby — "there are problems . . . some of which may have been underestimated". So much for him, but perhaps she should mention that Mellanby is not alone. There are other students of agricultural policy who have arrived by different routes at substantially similar conclusions, and their aim (and his) is primarily to secure food supplies. The benefits to the landscape are a by-product of what some people believe is a practical — in the end, perhaps the only practical — approach to future agricultural development in Britain. More emphasis on this approach might provide conservationists with better arguments — and, perhaps better insight into the ecology of farming — than the book's somewhat Panglossian acceptance of the benificent and inevitable attitude of those to whom the countryside is no more than a factory floor.

Michael Allaby

#### AUTHORS IN THIS ISSUE

Peter Bunyard & Andrew MacKillop are associate editors of *The New Ecologist* with special interest in the nuclear debate and alternative energy.

**James Harding**

is an environmental researcher and activist in Ontario.

**Ralph W. King**

is a consultant chemical engineer.

**David W. Greenstock**

is a biologist doing original research in nutrition and allied fields.

**Anil Agarwal**

is assistant editor of *Earthscan*.

**Wouter van Dieren**

is Director of the Foundation for Applied Ecology in Edam, Netherlands.

**Wayne Linn**

is a lecturer at Oregon State University and spent two years in the Peace Corps mission in Malawi.

**Anthony Netboy**

lives in Oregon and visited Malawi last year.

**Erratum**

*Micheal Allaby was not the author of the Wildlife report in our last issue, which was compiled by the editorial staff. We apologise for any contrary impression which may have been given.*

#### OTHER BOOKS RECEIVED

**The Virtuous Weed.** Joy Griffith-Jones, Blonde & Briggs Ltd., 95p.

Further proof that many humble plants that gardeners dismiss as weeds are in fact full of virtue and waiting to serve us as foods, garnishes, cleaners, drinks and remedies. Charming produced and illustrated with engravings from John Gerard's sixteenth century herbal.

**Small Scale Water Power, Small Scale Wind Power.** Both by Dermot McGuigan, Prism Press, £3.95 each.

Detailed descriptions of working water power systems and windmills, including analysis of output and costs. The value of these two books is largely in explaining what can be achieved and how feasible the alternatives are in a given situation. Easy to follow, clearly illustrated and full of information.

**Solar Age Catalog.** A guide to solar energy, knowledge and materials from the editors of *Solar Age* magazine, Prism Press, £5.50.

A comprehensive guide including articles by experts in the field. An American publication with perhaps slightly less relevance for readers outside the USA, but you certainly get your money's worth.

**Keep it Simple.** John Seymour. Black Pig Press, 95p.

Selected essays, mostly reprinted from *Resurgence*. Witty, observant, original and always a pleasure to read, John Seymour rails against bigness, bigots and bureaucracy, especially insofar as they destroy the proper husbandry of land. "I don't believe there can be a happy people or a free people in ill farmed land", he writes, "And I find it hard to believe that there could be an unfree people in a well farmed one."

**Earth, Water, Wind and Sun.** D.S. Halacy, Harper & Row Ltd., £4.95.

Alternative energy sources from water hyacinths to waves and from the sun to the wind examined with considerable technical details. Looks comprehensive and useful. Well illustrated.

**Working with the Stars.** A biodynamic sowing and planting calendar. Maria Thun, Lanthorn Press, Peredur, East Grinstead, Surrey. Price £1.00 post free (UK).

For those convinced that cosmic influences on the soil help to determine the health and productivity of crops, this guide explains when to sow and harvest.



## Letters

### The Masters of Destiny

Dear Sir,

'Forget politicians', says Kenneth Meek (*The Ecologist*, October 1977), but does he not realise that society's present disillusionment with them is a manifestation of the deepest malaise? All societies have a political system of some sort, whatever the size of the electorate and the means of expressing their wishes. In theory at least, this is the means for society to decide where it is going.

Certainly, we have a very unhealthy situation when the two main parties appear to have things so well wrapped up between them, but there are nationalist cracks in their facade and also various groups in this country who are fighting to present our electorate with a real choice. I do not feel that it is *The Ecologist's* job to get really involved in this — it already has a valuable function presenting the groundwork for ecological arguments. The politicians who do subscribe to the Blueprint are in these initiatives and need all the support they can get because we are in a situation where their failure will be a failure for society in general. We just cannot afford to turn our backs on politics entirely — this would be a complete abdication of our responsibilities as a society, an admission that we no longer care where we are being led; if this is the case, then we will deserve the future that currently threatens us.

Politics should not — cannot — be ignored; if we don't like it as it is, we must change it.

Yours faithfully,  
S.W. Lambert,  
(Ecology Party — London Branch)  
London.

### Anyone for the Horse-bus?

Dear Sir,

I was glad to see the letter from Mr. A.W. Thomas in the December issue which put forward a practical suggestion for financially supporting ecologically orientated communities. While this idea may be new in Britain it is working in various forms in other countries. The success of part-time farmers who work in factories on the Continent is such that both British farmers and British industrialists are complaining of unfair competition. Unfortunately small British farms are disappearing every week to be absorbed in the large syndicates managing hundreds or thousands of acres. Only by reversing this trend could we hope to establish the same pattern as is found in say France or Italy.

I think that Mr. Thomas's scheme might work if he provided a mini-bus to take his workers to and from the factory and distribute them round to their small-holdings which are likely to be scattered. Even such a small group as fifteen to twenty workers would probably have to be collected over several square miles of typical English countryside. Transportation is the great difficulty about subsistence farming where it still occurs in the British Isles. Crofters in the Highlands are struggling under the burden of running the tractors and cars which have replaced the pony. Alternatively if Mr. Thomas finds himself working with a group of real purists he could provide stabling for horses at his factory.

Yours faithfully,  
Leslie Millbank,  
Leigh-on-Sea, Essex.

### Vanity and Greed to the Rescue

Dear Sir,

Re: Slaughter in the Name of Science  
Soon after Sir Julian Huxley and others declared in 'The Times' that the white rhino was virtually extinct, I visited a part of Kenya where the increase in the white rhino population was the local administrator's horniest problem. Ever since I have been suspicious of zoological statistics. Assuming, however, that crocodiles are now genuinely threatened by scientists (and poachers), as you report, may I draw your attention to a saurian backlash of sorts — crocodile farming.

In Papua New Guinea there are now hundreds of small and a few large farms where, with F.A.O. backing, crocodiles are reared to the age of about three years. They are then slaughtered so that they may be sold in the first world's boutiques at up to £500 for a handbag. Thus vanity and greed may yet save the species.

Many may find crocodile farming as wicked as the forms of killing you describe; moral questions can be raised on all forms of animal husbandry. Let other pens dwell on the ethics. It is interesting to note, however, that following the introduction of croc farming in PNG, wild crocodiles are reported to be on the increase again.

Yours faithfully,  
Victor Gordon,  
Ufford, Woodbridge,  
Suffolk.

### Party Lines

Dear Sir,

I cannot let Richard Williams' letter (*New Ecologist* No. 1) pass unchallenged. If he can persuade the Conservative Party from within to change from a growth orientated Party to a non-growth orientated Party then good luck to him. Even if he succeeds however he will never persuade the hard core of Labour Party supporters to vote Conservative.

At times in the last few years it has seemed that the Liberal Party might be capable of being the vehicle for no growth politics, and a vehicle acceptable to former Labour supporters as well as Conservative supporters but alas it has not come to pass. Although many ecologically minded people have become Liberal supporters in the belief that the Liberal Party already is the Party that has seen the ecological light, they mislead themselves. As things

stand at the moment the Liberal Party is in the control of growth supporting politicians and its policies are growth orientated in a conventional economic sense. I am a founder member of the Ecology Party and am disappointed at its continued weakness, appalled at its lack of funds with which to carry on a political fight, distressed at the poor media coverage that it obtains. I am though enormously heartened when at Ecology Party meetings I see former Labour, Conservative and Liberal Party supporters and indeed activists, agreeing to bury the hatchet other than in each others heads, and agreeing to go forward together into a new sort of future. I state categorically that only a Party that can achieve this sort of reconciliation is capable of producing the majority that an ecological Government would need. The Ecology Party may be a sickly child, but so far as I am aware it is the only ecologically based Political Party currently meeting the above criteria. Agreed, it is not much but, God help us, it the best that we have. I implore ecological members of the 'main' Parties to throw aside their schizophrenia and support and work for the only Party that actually advocates what they believe in.

Yours faithfully,  
A.M. Whittaker,  
Dulverton, Somerset.

### Counting the Cost

Dear Sir,

Congratulations on publishing in the Jan/Feb issue 'The Hidden Costs of Nuclear Energy'. This is one of the clearest accounts, written for the layman, of the economics of nuclear power. I would like to send copies to some MPs with whom I'm in correspondence, and to others.

Yours faithfully,  
Kelvin Spencer,  
Branscombe,  
Seaton, Devon.

### Gagging the Doctor . . .

Dear Sir,

I have just read a frank and enlightening book 'Health Hazards of a Western Diet', by George A. Stanton.

Dr. Stanton illustrates quite vividly the difficulties experienced by an American, Dr. Price, in trying to get his views published on the subject of chlorinated water.

Dr. Price claims that the introduction of chlorine into water is responsible for the build-up of deposits found on dairy utensils and that some chicken pullets developed the same arterial conditions as did humans when drinking treated water.

The American put forward the theory that following his experiments on chickens he is convinced that the condition known as atherosclerosis is directly connected to the use of chlorine in water. The American doctor's findings may well be interesting but what is even more noteworthy is the fact that all manner of obstacles have been put in his way by big business to prevent him publishing the findings in his book 'Coronaries, Cholesterol, Chlorine'.

Yours faithfully,  
M. Smith,  
Barnby-Dun,  
Doncaster.



# Classified advertisements

## MISCELLANEOUS

USA WOMAN, 29 (lived previously in UK), wants to return to UK and live rurally in communal farming situation. Have been veterinary nurse 4+ years, have knowledge of animals and some small farming. Visiting UK to investigate possible situations, April 14-May 12. Any information, suggestions, possibilities greatly appreciated! Write: Summer Lee-Sankey, c/o Rees, 7 Sefton Close, Orpington, Petts Wood, Kent.

THE TEACHERS is a community searching for hard-headed realists who are NOT into money, status, marriage, religion and politics. We're looking for those into social responsibility and reform through education. We work like stink and we don't allow aggro. If it sounds like you, write for more information sending 30p to 18, Garth Road, Bangor, North Wales.

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Tickets: £4. For further details and booking form, please send a large SAE to: John Treble, Conference Organiser, E.228 London Road, Reading, Berkshire RG6 1AH. Tel: Reading 663281 (STD Code 0734).

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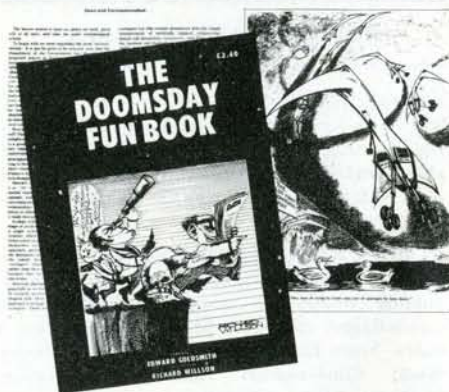

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