

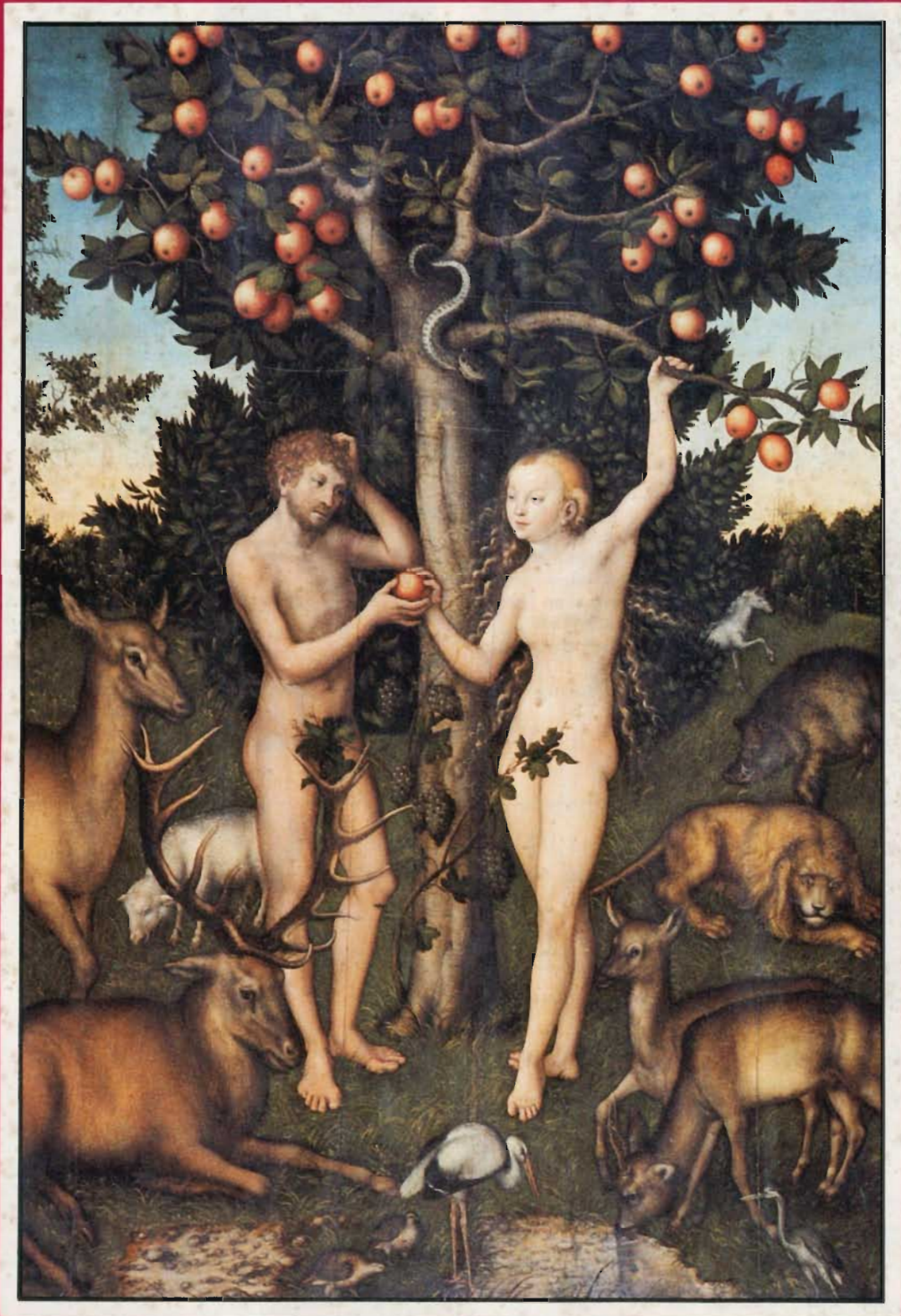
The Ecologist

Journal of the Post Industrial Age

Vol. 12 No. 6

1982

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GOD FORGOT TO PATENT IT



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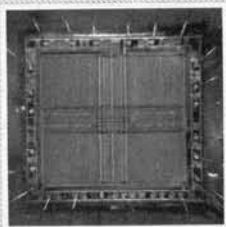
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The new seed-patenting laws and the fees that have to be paid for marketing old varieties are endangering the survival of our garden and agricultural plant heritage while enhancing the profits of the new seed merchants — the giant multi-nationals. Hills proposes counter measures that will have to be taken to ensure that we still have time-tried old-fashioned varieties to fall back on.

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The word 'peace' has been totally devalued. With the Romans it meant conquest and subjugation. Today, under the guise of economic development it has led to another kind of colonialisation. For the world to recover, Illich proposes that development must be curtailed.

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In his talk to the NGOs at the UNEP 10 years after Stockholm Conference in May 1982, Lutzenberger does not mince his words concerning the pace of destruction in Brazil. Multinational profits are one root cause by disturbing the entire social structure previously existing in the Amazon.

- Ira Rubinoff* Tropical Forests: Can we afford not to give them a Future?..... 253

Dr Rubinoff suggests a means whereby through taxation of the populations of developed countries large areas of tropical rain forests throughout the world can be saved from destruction. His proposals are essentially a follow on from other recent proposals such as those of WEAP, published three years ago in *The Ecologist*.

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The transition to an industrial system has led to an altering of man's psychological attitude towards his environment. Instead of revering the organic, man now turns to the inanimate, materialistic. And instead too, of looking for a means to do a task, he increasingly develops a technology and then looks for ways to use it. Man has therefore lost his sense of proportion with respect to his environment.

- John Robinson* Legitimisation for a Failing System..... 261

The modelling of the world in order to understand better the consequences of man's activities has failed to come up with convincing materials. What one man puts up, another knocks down. Robinson argues that instead we should be looking for new ways, for a new kind of collective response, to face the nigh-overwhelming problems facing us.

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Digest

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POWER—ATOMS OR ANIMALS?

For many years I have taken issue with the Atomic Energy Authority over nuclear power and have got myself embroiled in the usual arguments over safety, economics and need. Indeed, with the Sizewell PWR Inquiry already on its way I can see myself being kept busy with the reams of information and misinformation that pour out from the Maltings at Snape where the Inquiry is being held. But the issue isn't really nuclear power; it is much more fundamental and involves attitudes to life and human activities. The way that I look at the world and the way that my fellow brethren at the Atomic Energy Authority view precisely the same scene simply does not tally: one of us could clearly be on another planet.

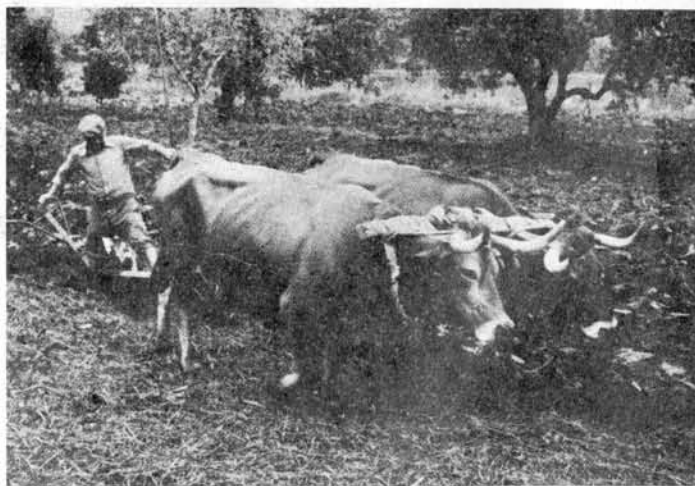
Take the article 'Energy: Boon or Birthright' in the September 1982 *Atom* — the house magazine of the Authority. There Simon Rippon, European editor of *Nuclear News* reports on a Foratom Congress in which participants from all over the world lament the down-turn in the fortunes of the nuclear industry. Mexico for instance wants 20 GWe of nuclear power by the turn of the century, but because of financial problems has failed to put in an order for a single kilowatt. The irony is that Mexico is suffering because it has oil to sell, not because it lacks it, and what really amazes me is that nuclear power proponents are ingenuous enough to believe that if only countries would take their courage into their own hands, as France has done and raced ahead with nuclear power, many of their economic difficulties would fade away. Yet nuclear power — as an energy source — is far more costly, as much as four or five times more than oil, and moreover, for countries such as Mexico, the technology has to be imported in its entirety. In effect, nuclear power is a luxury that some were able to afford when fossil fuels, and petroleum in particular, were cheap, as they were before the early 1970s, but which has become increasingly exclusive as the cost of the fossil fuels has risen.

Nevertheless, someone has to be found as a scapegoat for the misfortunes of the nuclear industry, and who better than the anti-nuclear brigade? At the Foratom Congress, Sir Walter Marshall, the new chairman of the Central Electricity Generating Board, summed up the sentiments of his pro-nuclear colleagues by saying "What a tragedy it would be if the psychological problems, which mainly arise in the prosperous developed countries, were to destroy the future of millions of people in the developing countries who cannot afford the luxury of philosophical doubts but want only to have enough to eat and to live their lives in reasonable comfort: a boon which anti-nuclear protestors in the developed countries accept without question as their birthright."

Such a declaration is patent, dangerous nonsense. Nuclear power does not bring food nor even comfort to the deprived millions in the developing countries. Moreover the very pursuit to possess

nuclear power and similar costly luxuries will if anything exacerbate the precarious position of the deprived who will find themselves pushed even more to the margins of the industrialised market system. Indeed the world does not face disaster because of a lack of nuclear power: it faces disaster because such technologies are being developed at the expense of traditions and ways of life that have provided the basis of a sustainable system of survival in many different environments throughout the world.

Which brings me again to attitudes: accompanying that very same article 'Energy: Boon or Birthright' is a photograph of a man, whom I estimate to be in the prime of middle age, in the act of clearing his plough, which is being pulled by two handsome oxen, probably Limousin cattle. The scene is undoubtedly somewhere in West Europe; I would guess Southern France, or Northern Italy. Anyhow the farming is traditional with olive trees in the background. But how does *Atom* choose to caption that evocative, powerful scene, with man and beast working proudly together? The caption reads "The plight of developing countries in the energy sector has so far failed to make much impression on the public at large. . . ." I must say I could hardly believe my eyes and was sufficiently incensed to write to the editor of *Atom*, protesting that the scene in the picture represented "highly productive farming using the most energy efficient techniques that have ever come man's way, other than hacking away at the ground with a hoe. Indeed the picture you present has absolutely nothing to do with the plight of developing countries and far from exhibiting energy starvation it demonstrates a way of life that will leave the world a more barren place for its passing."



For Atoms' caption, see above

James Daghish the editor of *Atom* had the grace to reply, but again missed the point. "I believe," he said, "that reliance on human and animal muscle power for food production will not meet the needs of the developing, or indeed the developed, countries and that increased energy supplies, including electricity generated by nuclear power, will be essential if great hardship is to be avoided."

Mr Daglish has yet to understand that the great danger to agriculture stems not from lack of energy, but on the contrary from too much energy. Hence, the industrialised farmer will think nothing of the damage he is doing to the soil when he runs over it with heavy machinery, nor will he consider the havoc he is wreaking to the ecology of soil when he applies his armoury of chemical fertilisers and biocides. Nor does he seem to care that his cash crops, grown over vast acreages on a monoculture basis, are draining the soil of its real fertility and are giving rise to erosion on an unprecedented scale. In effect, the one bastion of hope against the terrible degrading of soil that industrialised farming leaves in its wake, is the traditional farmer who still employs his beast of burden and who takes care to maintain his land in good order. Mahatma Gandhi, like others, saw the danger to India of trying to replace the bullock with the tractor, he clearly realised that millions of Indian peasants would lose their place in the economy of the land once mechanisation took over, but he also appreciated a more subtle relationship between the bullock and the land than one of simple replacement of one power source by another. In *Food Shortage and Agriculture* Gandhi refers to Shri N. G. Apte's *Economics of the Bullock* in which Apte states that: "The bullock is not only a living tractor; it is also a living fertiliser factory and gives us farmyard manure which supplies nitrogen and improves the porosity of the soil, thus helping to increase the moisture content of the soil as well as proper aeration. These three factors are essential to plant growth. No amount of concentrated manure would help if the porosity of the soil and consequent aeration of the soil are not improved."

Gandhi himself then pointed out that "The bullock's function as the manufacturer of first class fertiliser is not the only point where it scores over the machine. For no machine ever invented can perform the various duties that the bullock discharges. The bullock can work fast as well as slow. It can not only be yoked to the plough, it can be used in crushing the earheads as well as in carting grain to the market. All this it does, while subsisting on the straw or the cake left after the grain and the oil have been utilised for human consumption. This oil too is extracted by the same animal. A pair of bullocks costs a few hundred rupees, but if it is supplanted by machinery, the farmer must go in for an oil engine, a motor truck, a tractor, small motor driven harrows, which would cost him goodness knows how many times as much. Then again he must purchase fuel in the shape of oil, which cannot be produced not only on his own field, but even in his own country."

It may come as a surprise to nuclear power addicts to know how much the world is still dependent on the beast of burden. According to Noel Vietmeyer, professional associate of the U.S. National Academy of Science "Some 400 million horses, oxen, cows, water buffalo, donkeys, camels, mules, yaks, llamas, reindeer and elephants work for man today. They contribute about half the energy the Third World uses for agriculture and provide some developing countries with as much as 90 per cent of their agricultural power." In India, in 1980 animals provided as much as 30,000 megawatts of power — more than that provided by electricity in that country, and hauled more freight than the railways.

Vietmeyer is emphatic that it will be many, many

decades, if ever, before animal power can be (if it ever should be) replaced by mechanised power sources. Egypt apparently tried to get rid of its working donkeys but officials soon realised that the economics of replacing the animals with trucks would be economically disastrous. In fact, as Vietmeyer points out in *Ceres* (July-August 1982) the present trend is away from mechanised power and he refers to an economic analysis of farming in Malawi which demonstrated that farmers who used animals actually earned more than the farmers who bought tractors.

The great majority in the industrialised nations and many of those in Third World countries who aspire to a westernised style of life see the beast of burden as an archaic, albeit picturesque hang-over of pre-industrial times; moreover the very sight of a tractor and modern machinery in a field is enough to make them think the job is being done far more efficiently and proficiently than it ever would employing a slow, plodding bullock or ox. Of course the important thing is what is happening to the soil and whether its fertility in biological terms is being improved. Tenakoon, the Sri Lankan prophet, gave the answer to Goldsmith on being asked about the use of tractors (*Ecologist* Vol. 12, no. 5 1982, p.215). He pointed out that the buffalo's feet were just right for pressing down the soil of the paddy, whereas the tractor was far too heavy and ruined the soil crust so that nutrients were lost as well as irrigation water. "Needless to say", said Tenakoon, "the tractor neither defecates, nor urinates, hence makes no contribution to soil fertility. Nor does it produce milk and hence neither ghee nor curd, both of which play a very important part in our diet. Nor, for that matter does it reproduce itself, when it dies one simply has to buy another tractor."

Nevertheless, it would be entirely wrong to imagine that beasts of burden should be used in exactly the same way as they always have over millennia. The yoke is a "classic of bad design" Vietmeyer points out, putting a great strain on the animals' necks and preventing them from exerting full power. The use of a collar, like that used for horses since the 12th century, would increase the drawing power of an animal by as much as 50 per cent and keep the animal much fitter. Modern designs of equipment pulled by beasts of burden could also improve efficiencies and take the strain off animal and owner.

Overall, in answer to James Daglish of *Atom* I would say that the plight of the farmer in the Third World is that he has been made to feel that his centuries-old techniques are unproductive and backward. Hence he has struggled to get caught up in the cash economy system and for the most part has failed. In that same article is a comment on the 'firewood crisis' and the observation that 100 years ago as much as 60 per cent of India was covered in forest whereas only 10 per cent is left today. I would like to ask Daglish what process is causing India to destroy those self-same forests which it somehow managed to preserve for millennia. Might it not be that the same process which is driving us in the industrialised West to use nuclear power is the same one that is so rapidly destroying the biological basis of our existence?

Peter Bunyard

SEEDS OF DISCONTENT

Lawrence D. Hills

Director of the Henry Doubleday Research Association

The largest seedsman in the world is not Suttons of Britain, Burpee of the U.S.A. or Vilmorin of France. It is Royal Dutch Shell who have been swallowing small seedsmen until such craftsmen are a vanishing species. Indeed, as a consequence of legislation making it possible to patent seeds in 1970 the industrial giants have moved into the 50 billion dollar business that supplies the world with farm and garden seeds. And so has begun the eradication of the varieties of seeds that have provided the basis of farm and horticultural produce since time immemorial. With the passing of such seeds will go centuries of breeding for quality and resistance to disease. Meanwhile the new seed-sellers will be able to market these high-yielding varieties with all the chemicals that are necessary to maintain and protect them. Organisations such as the Henry Doubleday Research Association are fighting a rearguard action to save seeds for posterity and survival.

In the week that Britain passed what is called 'Plant Breeder's Rights'—legislation with hardly any publicity except to the seed trade—Messrs. Rank-Hovis-MacDougall took over 84 seedsmen, and they finished up owning over a hundred, being owned themselves, together with Messrs. Vilmorin and many Dutch, German and American firms, by Royal Dutch Shell. The export trade in seeds is doubling and redoubling, reaching £600 million in 1982, but two-thirds of the world total is still produced by the Government Plant Breeding Stations, like Britain's National Seed Development Organisation, and the many farmers in all countries who grow their own and sell to their neighbours, as they once did in the Corn Exchange in almost every English market town.

Only new varieties can be patented and earn royalties, up to as high as 15 per cent, all of which adds up to a large sum on a shipload of hybrid maize for a Third World Country. An example of the kind of new variety that makes mammoth profits for giant companies is the new American tomato Florida MH-1 which can be ripened by a special spray at any time to fit the market. A subsidiary of the seed firm makes the spray and the two could enjoy a temperate world monopoly from the immense advantage this offers all who sell tomatoes. What they are like to eat is another question.

Modern plant breeding is expensive. It needs laboratory facilities to breed for resistance to the diseases that can rip through a whole state or province, sown with the one variety that suits the market and yields enough to pay the costs and show a profit. It has also

become important to breed for the ability to take heavy dressings of chemical fertiliser and convert these into doubled production and resistance to powerful selective weedkillers and pesticides to keep pace with increasingly resistant pests.

Though plant breeders, (or rather the giant firms that employ them) are entitled to royalties on the seeds they breed, just as authors are on the books they write, the Plant Varieties and Seeds Act of 1964, (as amended by the European Communities Act of 1972 and enforced by the Seeds National Lists of Varieties Act of 1973), grants them advantages that will have the long-term effect of eventually excluding all varieties other than those grown on a large scale and controlled by a few large companies.

Consider the case of Maris Widgeon wheat from the Cambridge Plant Breeding Station but sold to commercial firms. This is a favourite of organic farmers because it will average two tons an acre of high protein grain that stonegrinds to make an ideal home breadmaker's flour. The registered maintainer has to pay a fee each year, which is the same whether he sells 500 tons a season, or a miserable 50, and must also grow a plot every year for inspection by the Ministry of Agriculture to see it is up to standard. The sales went down, because all the farmers were growing their own seed and selling it to each other, so the maintainer gave it up. Its name was published in the Plant Varieties and Seeds Gazette, anyone could have taken it on who would pay the fee. No-one did, and now it is an offence punishable with a fine of up to £400, to sell it or even catalogue it.

The pressure is still stronger on vegetable seeds, for unless a variety sells about 5,000 packets a year it does not pay to start that packeting machine. If you bring back a variety from the past, or have bred a new vegetable, you will have to pay £240 for the first two years to establish that the variety exists, during which no seed may be sold, you then pay £150 for registration, with fees every year that start with £120 and reach £210 in five years. This tax, and the formalities and delays, is prohibitive on varieties that have only a low sale to a specialised market, such as amateur gardeners, who increasingly have to buy what is bred for the market gardener, however tasteless they may be.

No variety can be patented or maintained unless it is uniform, distinct and stable. This brings up the question, "distinct from what?", and though it is possible to store millions of drawings in a patent office, vegetable varieties are far more difficult. To reduce the area of search there has been great reduction in numbers, which has meant millions of gardeners (there are about 15 million amateur gardeners in Britain) searching catalogues, in vain, for old favourites which have been grown on their merits for centuries. They cannot be patented, only 'registered', so earn no royalties, however well they suit local conditions, or whatever their value to gardeners. Unless they sell by the 100 tons, they are out in this age of computers and accountants, rather than of craftsmen and customers.

In June 1978 Britain lost 600 'non-traditional synonyms', which are varieties that in the opinion of Authority are very nearly alike. The Authorities insist that what Britain lost is not the heritage of vegetable varieties from generations of gardeners, but those which are sold by dishonest seedsmen as different, when all are the same. The large seed firms have taken quietly, this unique accusation of bad faith with their customers because they stand to gain out of the patents. In addition we have lost 874 varieties that were distinct, stable and uniform, with qualities of value to gardeners. A classic case is that of the onion Up-to-Date, which the Ministry of Agriculture Department in charge of the National Lists considers is identical with Bedfordshire Champion. Yet, according to Ministry of Agriculture Bulletin No. 123, Up-to-Date had the *most* resistance to downy mildew and Bedfordshire Champion the least! We are far more likely to want to breed more disease resisting onions than larger sizes of lady's slipper orchids. The heritage of the genes in our vegetables from the past, is just as important as that in our wild flowers.

The National Lists of varieties were compiled in co-operation with the seedsmen in each E.E.C. country, except Eire and Luxemburg which import all their seeds. Therefore, the hundreds of varieties raised by gardeners, allotment holders and peasants, some reaching back to the 12th Century like the Martock bean, from the village of Martock in Somerset, and the Stoke Lettuce, one of the original cos varieties brought from the Island of Kos off the Turkish coast by Crusaders, were all ignored. These are history rather than horticulture, but as the ancestors of our modern vegetables, their inherited qualities are of value to the plant breeders of the future.



Are they Florida MH-1's?

Save our Seeds

It was the threat to these Goyas and Rembrandts of the kitchen garden that started the Henry Doubleday Research Association campaign in the spring of 1975. Then, the publicity in the Press, T.V. and radio led to the meeting with Oxfam and the National Vegetable Research Station that began the Vegetable Gene Bank at Wellesbourne, and made it possible for Oxfam to raise the £277,000 that established it. Government economy cuts permitting, it should be financed by the Agricultural Research Council.

It has accommodation for about 50,000 half kilo metal foil packets that can stay in cold storage for up to 200 years, though samples are taken out and grown on every twenty years to make sure they are still safe. These include samples of the varieties we lose every month by commercial pressures, as well as the June 1978 holocaust.

Many of these are first cross, or 'F.1 hybrids', which are bred by crossing two inbred varieties together, so that the seed from them has hybrid vigour and an outstandingly high yield, which is especially important with maize (corn in the U.S.A.). These are seedsmen's favourites, firstly because they can be patented (you cannot patent a variety from the past anymore than you can a Model T Ford, you can only pay to be its Registered Maintainer, so you have no royalties), and secondly because the customer cannot save his own seed. If you sow the seed from an F.1 hybrid it will resemble its inferior 'in-laws'. This is why the seeds expert trade is soaring—F.1 hybrids are good—so good that they drive the old kinds off the market. But you have to buy seed every year.

Seed can be withdrawn from the Gene Bank only by Plant Breeders, who can write in from any country and have a set of likely parents for their project sent without charge. If, however, there are only large firms left and few plant breeders, they will only withdraw to breed for immediate commercial success on a world-wide scale—the seed equivalents to 'Jaws' or 'Star Wars'. We cannot allow the world to put all its eggs in too few highly profitable baskets.

The Seed Library

It is still legal in Britain and the other E.E.C. Countries to *grow* seeds in your own garden and then *give* them to neighbours. Seeds for experimental

purposes may also be legally given, but not sold, so it was possible for the Henry Doubleday Research Association to start a Seed Library for members, who are taking part in an experiment to see if the varieties from the past are really tastier than those of today, as every middle-aged gardener insists.

The seed is raised mainly by members who become 'Seed Guardians' and raise single varieties of different races to avoid cross pollination. One pea, one bean, a lettuce and a carrot as an example. Some are raised on the Association's Trial Ground at Bocking, and the cabbage tribe are grown with professional assistance. A syndicate of six Cornish broccoli growers are at present paying a fee to a retired Ministry of Agriculture seed expert to raise broccoli seed which is distributed to them all without payment, and there is another syndicate in Brittany, but this has not yet been tested in the courts.

The seed library is legal, because the seed is for experimental purposes, and though members pay 50p. postage and handling for the seeds they choose from the list of experimental material (not an "offer for sale") there is no way in which the Library could be used to obtain cheap vegetable seeds. The varieties are largely gathered in from cottage gardens, and anything of interest to the Gene Bank is passed on and stored.

The Vegetable Sanctuaries

It has been argued that the Vegetable Gene Bank is all that is needed, because the varieties from the past can stay safely in cold storage like pictures in the cellars of the National Gallery. The important difference between pictures and living seeds in a changing world is best illustrated by the story of potato wart disease. This fungus (*Synchytrium endobioticum*) first appeared in the 1890s, spreading slowly on cart wheels, horses' hooves, barrow tyres and boots, looking like black cauliflower curds on rotten potatoes, and lasting thirty years in the soil. In 1908 it became a notifiable disease and in 1909 Mr. C.G. Gough, a Ministry of Agriculture Inspector in the Wirral District of Cheshire, observed that Snowdrop and Golden Wonder were thriving where all other varieties were wiped out. It is from these surviving varieties that our immune varieties have been bred.

Had we grown only our most high yielding and popular variety King Edward (over 70 per cent of our greenhouse tomatoes today are Soatine, because it grows over 100 tons an acre), which is non-immune, with all the other varieties safely stored in a Gene Bank, we should never have learned that it is possible to breed for immunity.

In a vegetable sanctuary we have a range of varieties from the past, grown year after year, through changing climate, rising pollution and new pests and diseases. This ensures that the modern successors to C.G. Gough in search of answers to new problems, can look at these to see how the vegetables of the past stand up to the diseases of the present, and what hope they offer of breeding resistant varieties for the future.

In plant breeding, excellence is the enemy of choice, since every seedsman wants to sell the newest

and best variety, and every grower to grow it. This is why, now that Greece has entered the E.E.C. all her peasant-saved seed varieties are in danger of destruction, because all her peasants will buy the latest high-yielding hybrids to pile their vegetable mountains still higher, and will cease saving their own seed of varieties that reach far back into their history. Therefore, we need vegetable sanctuaries to preserve the world's stocks and safeguard the future. A vegetable sanctuary can be likened to a picture gallery of our ancestors. But one in which they could step from their frames alive again, in any hour of their country's need.

The Henry Doubleday Research Association started its first vegetable sanctuary at Dean's Court, Wimbourne, Dorset, home of Sir Michael and Lady Hanham in 1980, in 1981 they started one in the gardens of Stately Homes open to the public, and all another at Quarry Bank Mill, Styal, Cheshire, and a third at Harlow Carr, the Northern Horticultural Society's gardens near Harrogate. In 1982 another was opened in the great walled garden at Croxteth Country Park, near Liverpool. All are in the kitchen gardens of 'Stately Homes' open to the public, and all are financed by the owners. The Association merely supplies the historic seeds which are an attraction, like antique cars or lions.

There is no shortage of willing and interested country house owners. The only lack is funds, and sufficient to pay an extra gardener for every mansion, and a retired seedsman to go round and give technical help and advice.

The Situation in Europe

Europe has exactly the same restrictions on seeds as in Britain, but West Germany and Holland have a far larger share of the world's seed trade than Britain; they are third and fourth to the U.S.A. and Japan. There are many farm and other seed gene banks in Europe, including one for macaroni wheats in Italy, but nothing for vegetables, other than Wellesbourne.

Although all countries have modern seed firms linked with each other, in 1976 when a survey was undertaken, it was found that many local varieties still survived in France, Italy, Yugoslavia and Hungary, on a greater scale than in Britain. The basic problem is always that when the older generation of gardeners dies out, their sons do not take on the task of raising their own seeds, but buy the latest hybrids. The urgent

'Stately Home' kitchen gardens—a last haven for old varieties?



need is vegetable sanctuaries to preserve the genetic heritage of all countries, before it drowns under the flood of F.1 hybrids.

The urgency arises because Greece has now entered the E.E.C. and Spain and Portugal are about to enter, and in many areas of Greece 25 per cent of the seeds are sold direct by peasants to each other. Once the Patent Laws apply, and the large seed firms supply the market, the local varieties that have been grown for centuries will vanish.

It is not a conspiracy of multi-national companies that is the danger, but the Gresham's law of horticulture, that excellence is the enemy of diversity. In every country where the new, patented hybrids are sold, their good qualities in the way of immediately increased yields will drive out the traditional varieties, and rob the future of the genetic diversity that we shall need, perhaps more urgently than we shall wildlife and wild flowers.

We can no more deny the peasants of Europe (or any other country) the right to buy the seeds that will bring the most productive crop, than we can compel seedsmen to sell varieties that no longer yield a profit. Therefore, Europe needs vegetable sanctuaries. As in Britain, they could be sited in the kitchen gardens of country houses which are already maintained for their architectural, amenity and historic value, and staffed by the many elderly seedsmen and peasants who still know the good qualities of the vanishing vegetables. There would be close co-operation between the gene banks and government research stations and the vegetable sanctuaries. It has been objected that vegetable sanctuaries would be impossibly costly because of the labour required, but in an age of unemployment which eagerly spends £50,000 on providing one new job in the motor industry, they would be bargains. Almost all the investment and costs would be in people and plants, not in machinery. Every country has great houses that are part of its heritage, and these are far more costly to maintain than collections of vegetables.

The Situation outside the E.E.C.

The driving force behind plant patents is the International Union for the Protection of Plant Varieties, known as U.P.O.V. in Geneva, which is financed by the large seed companies, and its relations with European Ministries of Agriculture, gene banks and research stations are excellent. It is also supported by the U.N. and its association with the E.E.C. has made it possible for the legislation to go through easily in Europe.

There is no country where 'Plant Breeder's Rights' have been enforced as completely as in Britain and her E.E.C. partners. In the U.S.A. the Plant Protection Act of 1970 and the Senate Bill S.23 went through and established Plant Patents, but there have been constant attempts to amend the regulations to make them as complete as those in Europe.

Instead of a single payment to the registered maintainer of a variety, who usually sells it wholesale to other seedsmen, U.S. firms have to pay a two dollar

annual registration fee for every variety in the catalogue, for all fifty States, which restricts the number of varieties, and of course favours the firm which sells varieties in tons against small family businesses. It is rumoured that before the end of 1982 an attempt will be made to get a bill amending the act through Congress. So far all attempts have been frustrated by storms of public protest.

In Canada, after two attempts, a bill enforcing plant patents was passed in 1980 but the authorities made no attempt to enforce it, because of the public outcry, with 50 per cent of Canadian farmers opposing the legislation. *Seeds of the Earth*, a book by Pat Roy Mooney, published by The Canadian Council for International Co-operation and the International Coalition for Development Action, (a body now based in Brussels) in 1979 in English, French and Spanish, has become an international best seller. Though large seedsmen and U.P.O.V. have criticised it fiercely, it has led to a wide discussion of the issues involved.

In both Canada and the U.S.A. there are a number of 'Seed Exchanges' run by individuals and organisations who charge small fees for circulating lists of 'wants' and 'offers', and there are several small firms specialising in 'native' or 'rare' varieties sold to interested gardeners. Such action is still legal in the U.S.A. but not in Britain and Europe. No test cases have yet been fought, though in Europe there are reports that the regulations are broken freely by seed firms in Holland, while they are widely ignored in France and Italy. In Britain, only one firm so far has been fined for selling seeds before the trial period was completed, not for continuing to sell historic species.

In Australia militant groups are fighting the Plant Variety Rights Act in every State of the Federation. A book *Seeds for the Taking* by Mark Cole and Tony Belcher, published by The Food Justice Centre, a campaign run by Friends of the Earth, Sydney, is spear-heading the attack at one Australian dollar a copy. The storm began after an intense lobbying campaign supported by Shell Oil and Continental Grains, which made the Australian Department of Primary Industry (equivalent to a Federal Ministry of Agriculture) draft a 'Plant Variety Rights' bill known as PVR, which Mr. Peter Nixon (equivalent to Britain's Minister of Agriculture) was to have introduced in 1981. This bill was deferred till the Spring of 1982 and public agitation has again postponed it, until it is rumoured to be waiting until 1983.

Australia suffers from one large firm having almost a monopoly and if this does not list a variety it becomes unobtainable. Therefore, the Australian Groups of the H.D.R.A., centred on Perth, Sydney and Brisbane began their own libraries of home saved seeds, raised by members and sold cheaply in aid of funds. As in many other countries, a kind of 'Alternative Seed Trade' is growing, and just as in Britain the loss of favourite varieties was blamed on the unpopular E.E.C., Australian seedsmen are gathering much ill will from their customers.

The Australian official worry is if they do not adopt plant patent legislation their farmers and growers will be denied the benefit of the latest high yielding

varieties, because the seed combines will not sell a patent variety to a firm which will be able to multiply it and sell it cheaply without paying royalties. National Farmpoll VII (a kind of agricultural Gallup poll) showed a two to one majority against PVR.

Though the Indian seed trade is in favour of plant patents, Dr. M.S. Swaminathan, who was recently elected chairman of the F.A.O. Council and is a former director general of the Indian Council of Agricultural Research, made the following statement earlier this year. "We have no proposal to introduce legislation for providing patent rights to plant breeders in our country. Plant breeding effort is mainly supported from public funds.

"Private plant breeding work is restricted mainly to a few hybrids and to horticultural and ornamental plants. I am personally against patenting policies for new varieties of crop plants.

"The poor nations of today were in the past the centres of origin of most of the economic plants. It is because international plant exchange has taken place in a free manner subject only to quarantine regulations that we have witnessed rapid progress in plant breeding after the birth of the science of genetics in this century. Most of the cultivators of the world are poor with very little capacity to purchase inputs and to take risks. The aim, therefore, should be to reduce the cost of inputs and insulate farmers from avoidable risks.

"Patenting and other forms of legislation which come in the way of free exchange of germplasm will further retard transfer of the latest technology to small farmers".

New Zealand has no plant patent laws and a group of their M.P.s are preparing a bill to defend their country against the consequences to their small seed trade, and their farmers and growers. So far no Third World Country has adopted plant patents. The effect of their so doing would be disastrous.

The Third World Seed Problem

In terms of the world's genetic heritage, the loss of vegetable varieties in Europe, America and Australia is of minor importance compared with the destruction of those in the Third World. At least 500 major vegetable *species* were grown by the ancient civilisations of the world, which has dwindled to 200, of which only 80 are grown commercially. The Western World relies on only 30 species for 94 per cent of our vegetable nutrition.

In Sri Lanka they grow 40 species of root (compared with only twelve in Britain today) and 28 species of leaf vegetables. There are 22 provinces in Sri Lanka and three climate zones, ranging from steamy tropics at sea level (where "The Bridge on the River Kwai" was filmed), through sub-tropical, up to the temperate highlands where the tea plantations are. All grow roughly the same vegetables with varieties to suit each zone and district.

Company-produced seeds are bred to pure lines, as alike as identical twins. What can be termed 'unexploited seeds' from Third World Countries (Sri Lanka is horticulturally a First World country because they

have been gardening for about a thousand years longer than Britain) are more like football teams with full backs for cold years, centre forwards for dry ones, and goalkeepers to resist pests and diseases. Their individual talents are blended to produce a crop for all seasons. Each variety has over the centuries become suited to the conditions of its zone or district, and no pest or disease can sweep suddenly through it as southern corn leaf blight did in the U.S.A. in 1970 or downy mildew in pearly millet in India in 1971.

Now, these varieties are rarely "uniform, stable and distinct". If any Third World country adopted the U.P.O.V. plant patent system, *all* the local varieties would become illegal. Each one is a gene pool in itself, a centre of genetic diversity which is as unexplored as the botanic treasures of the Amazon. There is undoubtedly scope for selection and breeding from these collections of vegetables, but it is as essential to keep a reserve of the original race growing under the original conditions, as it is to preserve the wet lands of Europe where the rare birds and bog plants grow.

The Limitations of Gene Banks

When an unexploited vegetable variety, (which could be called a 'U.V.V.' for short, a term to include variable species since, as Darwin established, species are not fixed but collections of variations) is stored in a gene bank there is a random selection of those variations which will not take twenty years freezing. Then when grown on such varieties provide variations that suit the conditions near the gene bank. As an example, a rice variety from Sri Lanka sent to a gene bank in the Phillipines may well lose its 'goal-keeper' from the balanced team that suits the country it came from, and as it is grown on repeatedly through the years, the mixture would be further and further from what was originally stored.

This problem does not arise with pure lines or the inbred parents of F.1 hybrids, only with mixtures. The only European examples are the broccoli strains grown by the Cornish and Brittany farmers who expect to start cutting a field in October and keep on till March, with all sizes available, and as much disease resistance as possible. The National Vegetable Research Station at Wellesbourne bred a modern version, but had it banned by the E.E.C. regulations. The only way the growers can get this is by employing a retired seed expert to grow their seed, as stated earlier. So far the quantity involved has not stirred Authority to action.

Third World Vegetable Sanctuaries

The Henry Doubleday Research Association, with the co-operation of the Sri Lanka Rural Organisation, which is a peasants co-operative working to create labour intensive industries that consume the minimum imports and with the support of Christian Aid, which has made a grant of £1,000 a year for three years, has started the world's first Third World vegetable sanctuary. A member, Dhanapala Samarasekara, has provided a site of about five acres, which will be rice

paddies, growing at first three out of sixteen traditional mixture rice varieties that are now being driven from cultivation by the 'Green Revolution Grains'.

These better varieties need quantities of chemical fertilisers and pesticides which exterminate the eight species of sprat-like fish that live in the flooded paddies and provide a major part of the protein in the local diet. There are no Fish Fingers in Sri Lanka, just catch-it-yourself fish, like pick-it-yourself strawberries. The traditional rice varieties produce two crops a year, with the second one sown in a seed bed before the first is harvested, and transplanted into the vacant paddy. The old kinds lasted about a year, but the modern hybrids last only six months, so fresh seed has to be bought from the big companies for every sowing. In Britain those who do not buy Spanish or Louisiana organically grown rice, are now finding a sudden tastelessness in what they buy from ordinary shops—the high carbohydrate, low protein Green Revolution varieties are being exported to earn better prices from British housewives rather than from citizens of hungrier countries.

An important part of the idea of Third World vegetable sanctuaries is the concept of the 'Farmer Curator'. There are no stately homes with walled kitchen gardens in Sri Lanka, India or Bangladesh and the man in charge must be an experienced farmer or gardener who knows the traditional methods and can pass them on to students before his knowledge dies with him.

The Sri Lanka sanctuary has Mr. Illesinghe, President of the Sri Lanka Rural Organisation and the retired headmaster of a school famous for its farm course and its horticultural section. Since his retirement he has been cultivating rice. He would require an honorarium and travelling expenses, for the rice paddies are seven miles from a further five acres of vegetable growing land. He will earn £15 a month, plus £100 a year travelling expenses, with a part-time typist at £10 a month, two full-time farmworkers at £15 a month, and the balance of the £1,000 would pay general running expenses. These wages are in line with local rates, and explain why volunteers from the West are too expensive, unless they have special skills.

The £1,000 a year should produce in the course of three years:-

- 1) An accurate estimate of the social, environmental and economic gains and losses from growing traditional rice varieties rather than modern, high yielding, hybrids.
- 2) A record of the traditional ecology of rice paddies in Sri Lanka, including the replacement of tractors by water buffaloes since recent oil price rises.
- 3) Facilities for the study of this ecology and the traditional rice varieties by scientists from other countries.
- 4) The preservation of the traditional races of rice and their supply, both as grain and seed for distribution experimentally or commercially.

Three years is not long and this enterprise is starting on the barest minimum of funds, but it has a chance in that time of becoming self supporting. For while the

West gladly invests in nuclear power stations and mighty dams, something that merely provides jobs for hard working intelligent brown people is apparently less attractive to fund.

Rice is both wind and bee pollinated, but if the varieties on a single site are restricted to three, cross pollination can be avoided by staggering the sowing dates. It would be possible with sufficient funds to run a complete collection of all sixteen varieties, widely separated and also part from the Green Revolution varieties to avoid crossing with these.

The rice varieties are chosen because they are in the greatest danger and because it is possible that the whole enterprise could become self supporting.



Rice with a patent

Mr. Samarasekara has a journalist friend who will prepare a small booklet on the rices of Sri Lanka, and when we have a set of varieties available, samples from the sanctuary could be packeted on tea packeting machinery for sale in health-food shops as a trial. As a start the Wholefood Shop in London's Baker Street is co-operating. No Sri Lankan buys just 'rice', any more than we ask for just 'meat' in a butcher's shop. It is likely that several of these rices will suit Western tastes, and these could be grown on contract by local farmers if we built up an export trade in high protein rices, organically grown, for the whole-food trade.

The vegetable collection would also need to be scattered like those of seed guardians in Britain, so that each area would grow varieties of different natural orders, or with different chromosome numbers, that like onions and leeks, would not cross. These varieties would not only need to be grown as traditional mixtures, but selected and bred, to see whether the application of modern plant breeding techniques would be valuable in terms of yield and other qualities.

Towards an Answer to the Seed Problem

An author's or musician's royalties end fifty years after his death, so do those of all inventors. There comes a time when every invention becomes part of the common stock of humanity or enter public domain. The whole world is not still paying royalties on the wheel to India.

The outcry against plant patents is not against the right of the plant breeder to enjoy a reward on his skill and his investment. It is against the demand made by his organisations to enjoy rights that no other patent holder or creative artist has ever claimed. No playwright has ever insisted on making it impossibly costly and difficult to print or perform Shakespeare or Euripides. You cannot patent a Model T. Ford, but no one can stop you making an exact replica and selling it. Unfortunately, you cannot breed good automobiles or tractors.

We need a two-tier system of plant varieties. The top tier would be those which are bred today and patented as they now are, with royalties to reward the breeder, or rather his employers. The lower level would be 'Historic', with a ruling that any variety older than fifty years should be outside the existing regulations to be bought or sold freely in any country. They would be part of the common heritage of humanity, like the wheel, the arch, the lever and Beethoven's Ninth Symphony.

A 5—point plan:

- 1) This simple way round would allow small seedsmen sell 'H' seeds (like Caruso records) to those who appreciated their qualities and did not expect them to have been checked, and inspected and up-to-date.
- 2) The peasants of Europe would be able to continue raising their own local varieties and selling the surplus, without deciding which peasant should pay £240 (or the local equivalent) to become the registered maintainer of a variety grown in his district for a thousand years.
- 3) This would exempt all the Third World 'varieties' from extinction if the countries they grow in wish to accept plant patents in order to buy new and patented hybrids.

- 4) Make it possible for vegetable sanctuaries, to sell seeds, and restore to gardeners the right to buy what they wish to grow in their own gardens. In no other field is the consumers choice limited by law to what it pays a trade to sell.

- 5) This would allow Third World sanctuaries the right to trade freely in the most historic seeds of all—the traditional unexploited seeds that deserve research on their qualities of hardiness and disease resistance, to be undertaken in other Third World countries.

The main objection to this simple and practical solution is that there are at least a hundred varieties of vegetable in Britain alone, including Pilot, an early pea grown since 1904, James intermediate carrots, 1885 Snows Winter white cauliflower 1900, and all the year round lettuces, 1895. These would not be maintained to the standard of the Ministry. The answer is that all would be a cheaper quality seed, and those who bought them would have to depend on the craftsmanship, honesty and reputation of the firm that sold it, as customers always have.

The other objection is that no-one wants to grow the out-classed varieties from the past when they can buy the latest modern hybrids until these are replaced by still later varieties, more finely tuned to the current state of the market.

That is where the vegetable sanctuaries of all countries come in, to preserve our genetic heritage, especially in the Third World, where it could be done at minimum costs compared with that of building hotels to accommodate those who come to photograph wildlife in a National Park. It is not patents that matter but people—willing, hard working, skilled and hungry. Saving the vegetable seeds of all the world would cost relatively little, in an age of aircraft, space, and nuclear power and weapons that could cost us the Earth.

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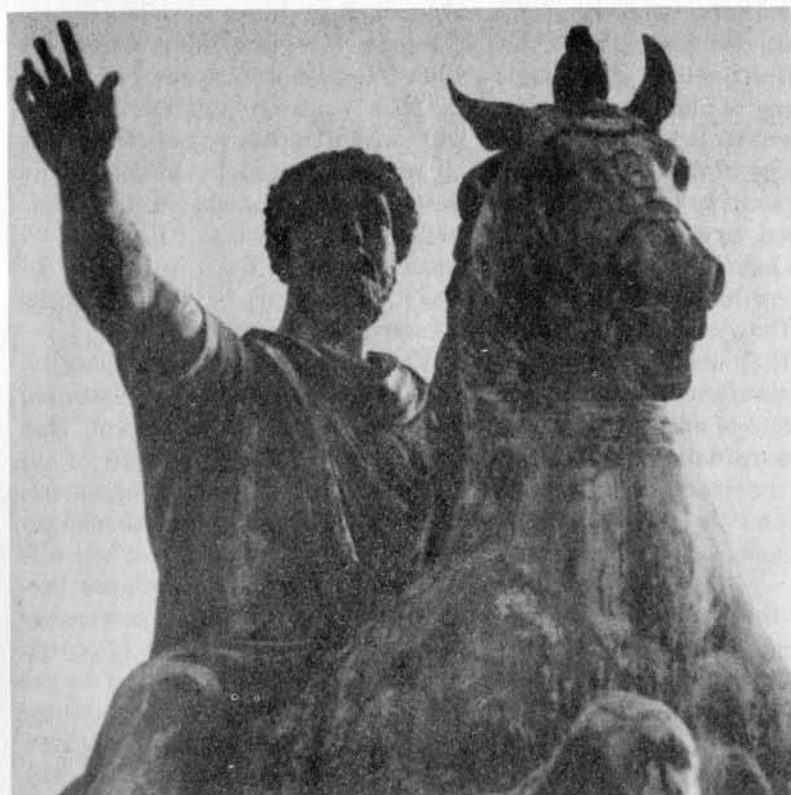
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Marcus Aurelius brings Pax Romana

THE DE-LINKING OF PEACE AND DEVELOPMENT*

Ivan Illich

Violence now lurks in many key words of the English language. John Kennedy could wage *war* on poverty; pacifists now plan strategies (literally, war plans) for peace. In this language, currently shaped for aggression, I must talk to you about the recovery of a true sense of peace, and bearing in mind always that I know nothing about your vernacular tongue. Therefore, each word I speak today will remind me of the difficulty of putting peace into words. To me, it seems that each people's peace is as distinct as each people's poetry. Hence, the translation for peace is a task as arduous as the translation of poetry.

Peace has a different meaning for each epoch and for each culture area. This is a point on which Professor Takeshi Inshida has written. And, as he reminds us, within each culture area peace means something different at the centre and on the margins. At the centre, the emphasis is on "peace keeping"; on the margin, people hope to be "left in peace". During three so-called Development Decades, the latter meaning, people's peace, has lost out. This is my main thesis: under the cover of "development", a worldwide war has been waged against people's peace. In developed areas today, not much is left of the people's peace. I believe that limits to economic development, originating at the grassroots, are the principal condition for people to recover their peace.

*Opening address. Conference on Asian Peace Research in the Global Context. Yokohama, December 1st. 1980. Copyright: Ivan Illich, 1980.

Culture has always given meaning to peace. Each *ethnos*—people, community, culture—has been mirrored, symbolically expressed and reinforced by its own *ethos*—myth, law, goddess, ideal—of peace. Peace is as vernacular as speech. In the examples chosen by Professor Ishida, this correspondence between *ethnos* and *ethos* appears with great clarity. Take the Jews; look at the Jewish patriarch when he raises his arms in blessing over his family and flock. He invokes *shalom*, which we translate as peace. He sees *shalom* as grace, flowing from heaven, "like oil dripping through the beard of Aaron the forefather". For the Semitic father, peace is the blessing of justice which the one true God pours over the twelve tribes of recently settled shepherds. To the

Jew the angel announces "*shalom*", not the Roman *pax*. Roman peace means something utterly different. When the Roman governor raises the ensign of his legion to ram it into the soil of Palestine, he does not look towards heaven. He faces a far-off city; he imposes *its* law and *its* order. There is nothing in common between *shalom* and this *pax romana*, though both exist in the same place and time.

In our time, both have faded. *Shalom* has retired into a privatized realm of religion, and *pax* has invaded the world as "peace", *paix*, *pax*. Through two thousand years of use by governing elites, *pax* has become a polemical catchall. The word was exploited by Constantine to turn the cross into ideology. Charlemagne utilized it to justify the genocide of

the Saxons. *Pax* was the term employed by Innocent III to subject the sword to the cross. In modern times, leaders manipulate it to put the party in control of the army. Spoken by both St. Francis and Clemenceau, *pax* has now lost the boundaries of its meaning. It has become a sectarian and proselytizing term, whether used by the establishment or by dissidents, whether its legitimacy is claimed by the East or the West.

The idea of *pax* has a colourful history, in spite of the fact that little research has been done on it. Historians have been more occupied filling library shelves with treaties on war and its techniques. *Huo'ping* and *Shanti* seem to have meanings today which are not unlike those of the past. But between them there is a

gulf; they are not comparable at all. *Huo'ping* of the Chinese means smooth, tranquil harmony within the hierarchy of the heavens, while *Shanti* of the Indians refers primarily to intimate, personal, cosmic, non-hierarchical awakening. In short, there is no "identity" in peace.

In its concrete sense, peace places the "I" into the corresponding "we". But in each language area, this correspondence is different. Peace fixes the meaning of the first person plural. By defining the form of the *exclusive* "we" (the *kami* of the Malay languages), peace is the base on which the *inclusive* "we" (*kita*) can arise. This distinction between *kami* and *kita* of the Malay languages comes naturally to most speakers around the Pacific. It is a grammatical difference utterly foreign to Europe, and completely lacking in western *pax*. Modern Europe's undifferentiated "we" is semantically aggressive. Therefore, Asian research cannot be too wary of *pax*, which has no respect for *kita*, the Adat. Here in the Far East it should be easier than in the West to base peace research on what ought perhaps to be its fundamental axiom: war tends to make cultures alike whereas peace is that condition under which each culture flowers in its own incomparable way. From this it follows that peace cannot be exported; it is inevitably corrupted by transfer; its attempted export always means war. When peace research neglects this ethnological truism, it turns into a technology of peace keeping: either degraded into some kind of moral rearmament, or perverted into the negative pole-mology—war science—of the high brass and their computer games.

Peace remains unreal, merely an abstraction, unless it stands for an ethno-anthropological reality. But it would remain equally unreal if we did not attend to its historical dimension. Until quite recently war could not totally destroy peace, could not penetrate all levels of peace, because the continuation of war was based on the survival of the subsistence cultures which fed it. Traditional warfare depended on the continuation of people's peace. Too many historians have neglected this fact; they make history appear as a tale of wars. This is clearly true of

classical historians, who tend to report on the rise and fall of the powerful. Unfortunately, it is equally true of many of the newer historians who want to act as reporters from the camps of those who never made it, who want to tell the tales of the vanquished, to evoke the images of those who have disappeared. Too often these new historians are more interested in the violence rather than the peace of the poor. They primarily chronicle resistance, mutinies, insurgencies, riots of slaves, peasants, minorities, marginals; in more recent times, the class struggles of proletarians and the discrimination battles of women.

The Peace of the Poor

In comparison with the historians of power, the new historians of popular culture have a difficult task. Historians of elite cultures, of wars waged by armies, write about the centres of cultural areas. For their documentation they have monuments, decrees engraved in stone, commercial correspondence, the autobiography of kings and the firm trails made by marching armies. Historians from the losing camp have no evidence of this kind. They report on subjects which often have been erased from the face of the earth, on people whose remains have been stamped out by their enemies, or blown away by the wind. The historians of peasantry and nomads, of village culture and home life, of women and infants, have few traces to examine. They must reconstruct the past from hunches, must be attentive to hints which they find in proverbs, riddles and songs. Often the only verbatim records left behind by the poor, especially women, are the responses made by witches and rogues under torture, statements recorded by the courts. Modern anthropological history, the history of popular cultures, *l'histoire des mentalités*, has had to develop techniques to make these old remnants intelligible.

This new history often tends to focus on war. It portrays the weak principally in their confrontations with those against whom they must defend themselves. It recounts stories of resistance and only by implication reports on the peace of the past. Conflict makes opponents compar-

able; it introduces simplicity into the past; it fosters the illusion that what has gone before can be related in 20th century 'uniquack'. Thus war, which makes cultures alike, is all too often used by historians as the framework or skeleton of their narratives. Today there is a desperate need for the history of peace, a history infinitely more diverse than the story of war.

What is now designated peace research very often lacks historical perspective. The subject of this research is "peace", purged of its cultural and historical components. Paradoxically, peace was turned into an academic subject just when it had been reduced to a balance between sovereign, economic powers acting under the assumption of scarcity. Thus study is restricted to research on the least violent truce between competitors locked into a zero sum game. Like searchlights, the concepts of this research focus on scarcities. And they permit the discovery of unequal distributions of scarcity. But in the process of such research, the peaceful enjoyment of that which is not scarce, people's peace, is left in a zone of deep shadow.

The assumption of scarcity is fundamental to economics, and formal economics is the study of values under this assumption. But scarcity, and therefore all which can be meaningfully analyzed by formal economics, has been of marginal importance in the lives of most people through most of history. The spread of scarcity into all aspects of life can be chronicled; it occurred in Euro-

The peace that passeth all understanding



pean civilisation since the Middle Ages. Under the expanding assumption of scarcity, peace acquired a new meaning, a meaning without precedent anywhere in Europe. *Peace came to mean pax economica*. *Pax economica* is a balance between formally "economic" powers.

The history of this new reality deserves our attention. And the process through which *pax economica* monopolized the meaning of peace is especially important. This is the first meaning of peace to achieve worldwide acceptance. And such a monopoly ought to be deeply worrisome. Therefore, I want to contrast *pax economica* with its opposite and complement, popular peace.

The 'Peace' of Development

Since the establishment of the United Nations, peace has been progressively linked with development. Previously this linkage had been unthinkable. The novelty of it can hardly be understood by people under forty. The curious situation is more easily intelligible for those who were, like myself, adults on January 10, 1949, the day President Truman announced the Point Four Programme. On that day most of us met the term "development" for the first time in its present meaning. Until then we had used development to refer to species, to real estate and to moves in chess. But since then it can refer to people, to countries and to economic strategies. And in less than a generation we were flooded with conflicting development theories. By now, however, most of them are merely curiosities for collectors. You may remember, with some embarrassment, how generous people were urged to make sacrifices for a succession of programmes aimed at "raising per capita income", "catching up with the advanced countries", "overcoming dependencies". And you now wonder at the many things once deemed worthy of export, "achievement orientation", "atoms for peace", "jobs", "wind-mills", and, currently, "alternative life styles" and professionally supervised "self-help". Each of these theoretical incursions came in waves. One brought the self-styled pragmatists who emphasized enterprise,

the other would-be politicians who relied on "conscientizing" people into foreign ideology. Both camps agreed on growth. Both advocated rising production and increased dependence on consumption. And each camp with its sect of experts, each assembly of saviours, always linked its own scheme for development to peace. Concrete peace, by thus being linked to development, became a partisan goal. And the pursuit of peace through development became the overarching unexamined axiom. Anyone who opposed economic growth, not this kind or that, but economic growth as such, could be denounced as an enemy of peace. Even Gandhi was cast into the role of the fool, the romantic or the psychopath. And worse, his teachings were perverted into so-called non-violent strategies for development. His peace too was linked to growth. Khadi was redefined as a "commodity", and non-violence as an economic weapon. The assumption of the economist, that values are not worth protecting unless they are scarce, has turned *pax economica* into a threat to people's peace.

The linkage of peace to development has made it difficult to challenge the latter. Let me suggest that such a challenge should now be the main task of peace research. And the fact that development means different things to different people is no obstacle. It means one thing to TNC executives, another to ministers of the Warsaw pact, and something other again to the architects of the New International Economic Order. But the convergence of all parties on the need for development has given the notion a new status. This agreement has made of development the condition for the pursuit of the 19th century ideals of equality and democracy, with the proviso that these be restricted within the assumptions of scarcity. Under the disputes around the issue of "who gets what" the unavoidable costs inherent in all development have been buried. But during the seventies one part of these costs has come to light. Some obvious "truths" suddenly became controversial. Under the ecology label, the limits of resources, of tolerable poison and stress, became political



Pax economica delivers the goods

issues. But the violent aggression against the environment's utilization value has so far not been sufficiently disinterested. To expose the violence against subsistence which is implicit in all further growth, and which is veiled by *pax economica*, seems to me a prime task of radical peace research.

In both theory and practice all development means the transformation of subsistence-oriented cultures and their integration into an economic system. Development always entails the expansion of a formally economic sphere at the cost of subsistence-oriented activities. It means the progressive "disembedding" of a sphere in which exchange takes place under the assumption of a zero sum game. And this expansion proceeds at the cost of all other traditional forms of exchange. Thus development always implies the propagation of scarcity—dependence on goods and services perceived as scarce. Development necessarily creates a milieu from which the conditions for subsistence activities have been eliminated in the process of making the milieu over into a resource for the production and circulation of commodities. Development thus inevitably means the imposition of *pax economica* at the cost of every form of popular peace.

To illustrate the opposition between people's peace and *pax economica*, let me turn to the European Middle Ages. In so doing, I emphatically do not advocate a return to the past. I look at the past only to illustrate the dynamic opposition between the complementary forms

of peace, both formally recognised. I explore the past rather than some social science theory to avoid utopian thinking and a planning mentality. The past is not, like plans and ideas, something which might possibly come about. It is not something which ought to be. The past has been. It allows me to stand on fact when I look at the present. I turn toward the European Middle Ages because it was near their end that a violent *pax economica* assumed its shape. And the replacement of people's peace by its engineered counterfeit, *pax economica*, is one of Europe's exports.

In the 12th century, *pax* did not mean the absence of war between lords. The *pax* that Church or Emperor wanted to guarantee was not primarily the absence of armed encounters between knights. *Pax*, or peace, meant to protect the poor and their means of subsistence from the violence of war. Peace protected the peasant and the monk. This was the meaning of *Gottesfrieden*, of *Landfrieden*. It protected specific times and places. No matter how bloody the conflict among lords, peace protected the oxen and grain on the stem. It safeguarded the emergency granary, the seed and the time of harvest. Generally speaking, the "peace of the land" shielded the utilization values of the common environment from violent interference. It ensured access to water and pasture, to woods and livestock, for those who had nothing else from which to draw their subsistence. The "peace of the land" was thus distinct from the truce between warring parties. This primarily subsistence-oriented significance of peace was lost with the Renaissance.

Pax Economica

With the rise of the nation-state, an entirely new world began to emerge. This world ushered in a new kind of peace and a new kind of violence. Both its peace and its violence are equally distant from all the forms of peace and violence which had previously existed. Whereas peace had formerly meant the protection of that minimal subsistence on which the wars among lords had to be fed, henceforth subsistence itself became

the victim of an aggression, supposedly peaceful. Subsistence became the prey of expanding markets in services and goods. This new kind of peace entailed the pursuit of a utopia. Popular peace had protected precarious but real communities from total extinction. But the new peace was built around an abstraction. The new peace is cut to the measure of *homo economicus*, universal man, made by nature to live on the consumption of commodities produced elsewhere by others. While the *pax populi* had protected vernacular autonomy, the environment in which this could thrive and the variety of patterns for its reproduction, the new *pax economica* protected production. It ensured aggression against popular culture, the commons and women.

First, *pax economica* cloaks the assumption that people have become incapable of providing for themselves. It empowers a new elite to make all people's survival dependent on their access to education, health care, police protection, apartments and supermarkets. In ways previously unknown, it exalts the producer and degrades the consumer. *Pax economica* labels the subsistent as "unproductive", the autonomous as "asocial", the traditional as "underdeveloped". It spells violence against all local customs which do not fit a zero sum game.

Secondly, *pax economica* promotes violence against the environment. The new peace guarantees impunity—the environment may be used as a resource to be mined for the production of commodities, and a space reserved for their circulation. It does not just permit, but encourages the destruction of the commons. People's peace had protected the commons. It guarded the poor man's access to pastures and wood; it safeguarded the use of the road and the river by people; it reserved to widows and beggars exceptional rights for utilizing the environment. *Pax economica* defines the environment as a scarce resource which it reserves for optimal use in the production of goods and the provision of professional care. Historically, this is what development has meant: starting from the enclosure of the lord's sheep and reaching to the

enclosure of the streets for the use of cars and to the restriction of desirable jobs to those with more than twelve years of schooling. Development has always signified a violent exclusion of those who wanted to survive without dependence on consumption from the environment's utilization values. *Pax economica* bespeaks war against the commons.

Thirdly, the new peace promotes a new kind of war between the sexes. The transition from the traditional battle for dominance to this new all-out war between men and women is probably the least analyzed of economic growth's side effects. This war, too, is a necessary outcome of the so-called growth of productive forces, a process implying an increasingly complete monopoly of wage labour over all other forms of work. And this too, is aggression. The monopoly of wage-related work entails aggression against a feature common to all subsistence-oriented societies. Though these societies be as different from each other as those of Japan, France and Fiji, one central characteristic is common to all of them: all tasks relevant to subsistence are assigned in a gender-specific way, to either men or women. The set of specific tasks which are necessary and culturally defined, vary from society to society. But each society distributes the various possible tasks to either men or women, and does so according to its own unique pattern. In no two cultures is the distribution of tasks within a society the same. In each culture, "growing up" mean to grow into the activities characteristic there, and only there, of either man or woman. To be a man or a woman in pre-industrial societies is not a secondary trait added on to genderless humans. It is the most fundamental characteristic in every single action. To grow up does not mean to be "educated", but to grow into life by acting as a woman or as a man. Dynamic peace between men and women consists precisely in this division of concrete tasks. And this division does not signify equality; it establishes limits to mutual oppression. Even in this intimate domain, people's peace limits both war and the extent of domination. Wage labour destroys this pattern.

Industrial work, productive work, is conceived as neutral and often experienced as such. It is defined as genderless work. And this is true whether it is paid or unpaid, whether its rhythm is determined by production or by consumption. But even though work is conceived as genderless, access to this activity is radically biased. Men have primary access to the paid tasks which are viewed as desirable and women are assigned those left over. Originally, women were the ones forced into unpaid shadow work, although men are now increasingly given these tasks, too. As a consequence of this neutralization of work, development inevitably promotes a new kind of war between the sexes, a competition between theoretical equals of whom half are handicapped by their sex. Now we see a competition for wage labour, which has become scarce, and a struggle to avoid shadow work, which is neither paid nor capable of contributing to subsistence.

Pax economica protects a zero sum game, and ensures its undisturbed progress. All are coerced to become players and to accept the rules of *Homo economicus*. Those



The peace of deterrence

John Topham

who refuse to fit the ruling model are either banished as enemies of the peace or educated until they conform. By the rules of the zero sum game, both the environment and human work are scarce stakes; as one gains the other loses. Peace is now reduced to two meanings: the myth that, at least in economics, two and two will one day make five, or a truce and deadlock. Development is the name given to the expansion of this game, to the incorporation of more players and of their resources. Therefore, the monopoly of *pax economica* must be deadly; and there must be some peace other than the one linked to development. One can concede the *pax economica* is not without some positive value—bicycles have been invented and their components must circulate in markets different from those in which pepper was formerly traded. And peace among economic powers is at least as important as peace between the warlords of ancient times. But the monopoly of this elite peace must be questioned. To formulate this challenge seems to me the most fundamental task of peace research today.

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THE SYSTEMATIC DEMOLITION OF THE TROPICAL RAIN FOREST IN THE AMAZON

Jose A. Lutzenberger

Jose Lutzenberger is an agronomist who spent a number of years working for the large agrochemical company BASF throughout the northern part of South America, North Africa and the Caribbean. By 1970 it had dawned on him that the products he was promoting were dangerous and destructive to agriculture and to the environment in developing countries. He quit his job and began a vigorous and successful campaign against the activities of the agrochemical industry. In his own state of Porto Alegre in Brazil he managed to get a 70 per cent reduction in the use of pesticides and herbicides and in 1978 was elected agronomist of the year by his fellow agronomists.

As an engineer he now runs his own soft-technology landscaping company and advises industry on ways to overcome the discharge of damaging pollutants through cost-effective recycle systems. His aim is to show that the majority of waste products can, if properly controlled, be used for such purposes as organic fertilisers. In Porto Alegre he is President of AGAPAN, the State association for the protection of the natural environment.

In May 1982 Lutzenberger was invited to attend the UNEP 10 years after Stockholm Conference in Nairobi, as an NGO to address the symposium on the Environment and the Future. He used the opportunity to describe graphically the ravages taking place in the Brazilian environment.

Brazil is one of the largest countries in the World. It has a surface area of 8.5 million square kilometres and a relatively small population of 120,000,000. Therefore, environmentally, Brazil should be in an excellent position. With so much land and relatively few people it should be able to afford to leave large tracts of wilderness intact and to have the best park and nature preserve system in the world. But that is not so.

What we see today in Brazil and in much of Latin America is the biggest biological holocaust in the history of life. Never in the course of three and a half billion years, since the first stirrings of life on this planet, has there been such wholesale, accelerated, violent demolition of all living systems as today. We have passed the point where we only desecrate this or that scenic landscape, this or that ecosystem. We are now in the process of demolishing whole biomes.

Indeed we are now gearing ourselves up to finish off the last large, more or less intact and contiguous jungle on earth, the Hylaea, or tropical rain forest in Amazonia. The rate of demolition is some 100,000 square kilometres a year. That means that every five years an area the size of France is razed. But other biomes are just as endangered or are gone already. The majestic araucaria forest in the south, which stood almost intact when I was a small boy, 40 years ago, is no more. The last relics, small patches of a few hectares are now being felled too. We are systematically liquidating another fantastic biome, the Brazilian savannah, or cerrado. Devastation has advanced much further there and is advancing much faster than in Amazonia. If present tendencies continue it will not be long before one of the most beautiful and richest natural systems in the world, the Pantanal in Mato Grosso, perhaps the biggest swampland in

the world, has become totally degraded to the point of annihilation.

All this destruction is being done systematically in the name of "progress". The Brazilian government, the military dictatorship which set itself up in 1964, set course for "development" at any cost. Their definition of development was the technocratic one—an economic model geared to making the strong ever stronger and the poor ever weaker. This attitude has not changed since Stockholm, where the Brazilian delegates brought ridicule upon themselves by inviting other countries to bring their pollution, "we still have many rivers to pollute". Today they do not talk that way anymore, instead they pay lip service to ecology. But devastation is worse today than ever before and the rate of destruction is itself growing at an exponential rate. Every year new forms of devastation, previously unimaginable, crop up even in places where no menace could possibly be suspected.

Holocaust in Amazonia

Large scale devastation of the tropical rain forest takes several forms. At one extreme we have megatechnological demolition. It is done by large multinational or national corporations as well as by powerful individuals who go to Amazonia to multiply their capital. Among them are such giants as Anderson Clayton, Goodyear, Volkswagen, Nixdorf Computer, Nestle, Liquigas, Borden, Kennecott Copper and the American multi-billionaire David Ludwig, or even farmers cooperatives from the south, such as Cotrijui. But this is a very small fraction of the total list; which runs into the hundreds. These outfits set up enormous projects—cattle ranches, paper mills, immense rice plantations, timber mills, single species monocultures for pulp. Each project means demolishing gigantic tracts of virgin forest, sometimes up to hundreds of thousands of hectares.

The efficiency of production is ridiculously low. On the cattle ranches the production of meat hardly reaches 50 kg of meat per hectare per year and it rapidly declines after a couple of years as the soils are rapidly leached of their scarce nutrients. Meanwhile the grasses and legumes sowed for pasture give way to scrub unpalatable to cattle that is either kept down with heavy machinery or with herbicides, thus contributing to still more destruction of the soil, and still lower production. Comparison with North Europe where on farms not using imported feed, meat production is closer to 600 kg/Ha/year, plus from 4,000 to 6,000 litres of milk indicates how scandalously low that productivity is. Milk is not produced on the Amazonian ranches. We must also remind ourselves that the intact forest, obliterated to give way to pasture, produced at least ten times as much food in the form of tropical fruit (an incredible variety), game and fish. Every single adult Brazil nut tree, every pupuia palm tree left in peace, produces more food than the cattle on one hectare. Another devastating effect of those schemes, this one social, is that they employ an average of one worker per two thousand cattle, that is, one person on at least 3,000 hectares. The same

area of forest could easily feed and house several hundred people if left intact. The traditional life style of the caboclo, the Indian and the seringueiro (rubber collector) is also much more pleasant, easier, independent and secure, than the life style of the ranch worker. The irony of it all is that the little meat produced is for export. The Amazonian caboclo wisely says—where cattle move in, we move out, cattle mean hunger. The only beneficiaries are the corporations who don't even spend the money earned in the areas they devastate.

The social devastation of the other schemes, extensive monocultures of trees, open pit mining, gigantic dams, timber mills and logging, commercial fishing, are just as bad. They are all geared to export and to the enrichment of the powerful from outside the region. There is no concern for the needs of the local populations. They are uprooted, marginalized, alienated and they go either to the slums or escape ever deeper into the jungle . . . The Brazilian government is now selling off whole mountains, such as in the infamous Caraja Project. Recently our minister of planning boasted of having received the first downpayment of four hundred million dollars from Japan for ore in the Caraja mountains. What will future generations say?

At the other extreme we have large scale demolition of the forest by small farmers; but this is also due to social disruption. The state of Rondonia, the westernmost state in Brazilian Amazonia, an area the size of West Germany (approximately 250,000 km²) is now systematically deforested at a rate that will leave the state naked by the year 1990.

Programmes for Development

Rondonia was chosen as an escape valve, so as not to force the establishment to face social justice in other parts of Brazil, the regions where the migrants come from. Hundreds of thousands of people are driven off the land every year. They are marginalized by big plantation agriculture in the North East, more recently in the central and southern parts of Brazil by programmes pro-

moting new gigantic monocultures, such as the Proalcool Programme, by flooding from giant dams and by the methods of modern agriculture, big farm machinery, the "green revolution", agrochemistry and an official agricultural policy that always promotes the big guy or corporation at the expense of the small and of the environment.

Thousands of migrants arrive in Rondonia every day in addition to those unhappy people, much more numerous, who can only escape to the slums. Some of the migrants try to settle on their own. They simply move into jungle areas as they become accessible through the new penetration roads that are constantly being opened by the road authorities. If they are lucky, they eventually get title to the land they settle on. For this they have to prove that they have made "improvements" on it. In fact INCRA, the agency that controls settlements, accepts as improvement the clearing of forest. Hence every wild settler cuts down as much forest as he can, often more than the area he can cultivate with crops. Many of these settlers go from one clearing to another. As soon as they get title or sufficient proof of property, more often than not, they sell to big outfits and move on. We have met settlers who make a living out of such land speculation.

The more common case, though, not so much in Rondonia but in other remote areas of Brazil, is that the wild settler is soon displaced by someone who comes with "legal" title to enormous tracts of land. The settler is then considered a squatter and driven off by the "jagunço", a hired gunman. Thousands of "squatters" are killed every year.

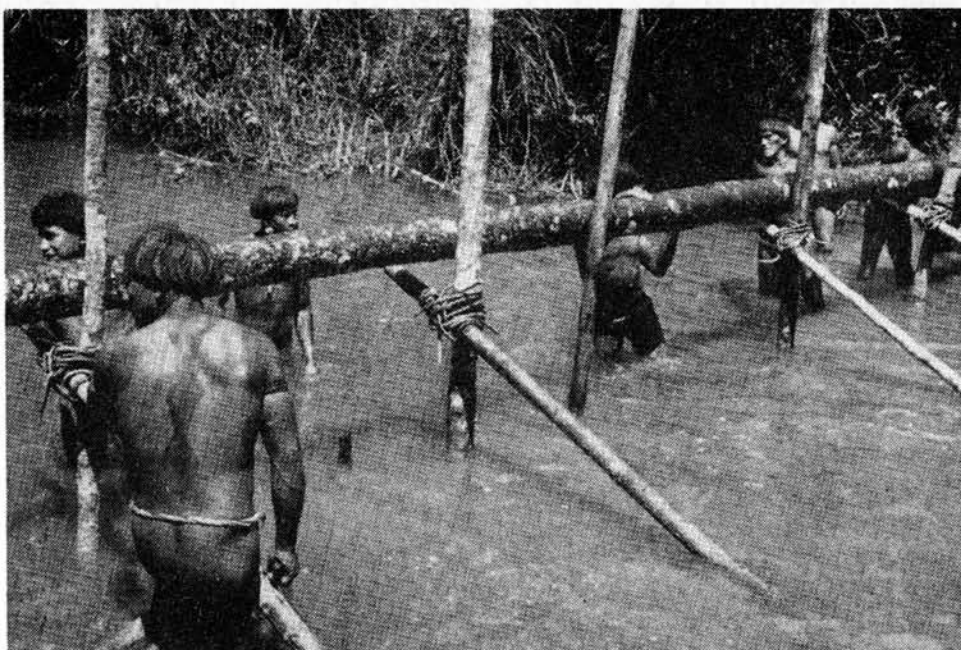
Where the settlers settle legally they end up in the settlement projects of INCRA. These projects are another example of total disregard for the Amazonian landscape and its people. The division of the land is conceived on the drawing board. A checkerboard-like pattern is imposed on the land without the slightest concern whatever for topography, steep slopes, rock outcroppings, little rivers or brooks, much less ecosystems (a concept that doesn't exist in the heads of the INCRA planners). The lots are 250

by 1000 or 500 by 2000 or even 4000 metres. Thus, the farmer actually gets a long strip of land. In some cases his land cuts across the meanders of the same waterway several times so he will have to build several bridges. Another farmer may have no access at all to water, or his land may cut across two steep slopes with two high plateaus and some lowland in between or vice versa. Inevitably he will chop down the forest on the slope. Even the areas officially left as forest reserves are marked on the map as squares or rectangles or triangles, somewhere in the corner of the project area, without reference to landscape.

There is absolutely no provision for the preservation of these reserves. The INCRA people say it is the responsibility of IBDF, the forestry agency; IBDF says it has no means to take care of the reserves. The whole scheme is set up in such a way as to guarantee maximum devastation.

The farmers are also left to themselves. There is no agricultural extension service worth that name. Government extension agencies promote only cash crops and the credit system is geared to monoculture. Most credit plans include a certain percentage of the money for pesticides and chemical fertilizer, completely regardless of whether there is need or not. Cash monoculture is controlled by specialised agencies such as CEPLAC for cocoa, IBC for coffee, SUDHEVEA for rubber tree plantations. Each agency insists on pure monoculture. Where farmers, out of their own wisdom, make mixed stands of coffee, cocoa, rubber or others, each agency threatens to cut credit unless the farmers return to pure monoculture of the respective crop. But practice has shown that mixed stands make for healthier plants, require less or no pesticides, and produce more on a more sustainable basis. An official experimental station in Rondonia will probably soon "prove" that mixed stands will not work. Thus although they have set up mixed stands, herbicides are used from the start.

Ecologically, the settlement schemes are probably more devastating than the megatechnological projects. In general on the big projects, half the land is left in forest



A way of life being threatened

whereas the settler finds it practically impossible to stop before the last patch of forest is gone. Thus the settler cannot stop if he wants to survive while the big outfit at least can become bankrupt or lose interest. Many of the big projects have already been abandoned.

Socially too, the settlement projects are very disruptive. First, by helping to prevent the necessary reforms in the areas where the migrants come from, and second by destroying the social fabric in the settlement areas. Those areas were not empty, as is often claimed.

For one, there is the Indian who is pitilessly liquidated or is driven ever deeper into the remaining jungle until he meets the advance from the other end. Moreover the rain forest Indians are extremely vulnerable to some of our diseases such as common cold, measles and VD. As soon as a tribe makes contact with the "civilised" invaders they face lethal epidemics. Often as many as 90 per cent of the Indians die within a few weeks of contact, and that is the end of the tribe. Some of the more powerful lusters for land take advantage of this fact and, from small planes, throw people's clothes onto the huts of the tribe. But there have also been cases where poisoned candy was used and other iniquities. When fighting breaks out between Indians and settlers, the Indian invariably loses.

The so-called protection of the Indian by FUNAI is a smoke screen.

The avowed aim of FUNAI is to "integrate" the Indian. Even for the survivors there is no respect whatever for Indian culture and language. The few surviving Indians, with rare exceptions, soon become totally alienated, uprooted and marginalised individuals with no future.

The disappearance of the rain forest Indians is perhaps one of the greatest tragedies of our time. The rain forest Indian is a true ecologist. He knows the forest as no modern ecologist can possibly get to know it. Yet our criminal economic models are exterminating them before we can even learn from them, just as we are exterminating tens of thousands of species every year even before we can catalogue them. Our indecent lifestyle is making sure that, when it collapses, there will be no alternative lifestyles left to take its place.

The new settlements also displace the caboclo and the seringueiro. The caboclo is the "civilised" successor of the Indian, usually of mixed stock, white and Indian, who lives in the forest surviving from shifting agriculture and as a hunter gatherer. His lifestyle is perfectly compatible with the survival of the forest, as long as his population doesn't increase too much. But we are still far from that. Nevertheless although the caboclo keeps much of the Indian wisdom and lifestyle, he has no reverence for the forest and its animal inhabitants.

There is also the small logger. He too is compatible with the survival

of the rain forest. He logs only on the flood plains from where he can take his logs out when the water is high, making rafts for transportation to the small lumbermills. The soil on the flood plains is the only really fertile soil in Amazonia. It is fertilized every year by the floods just as was the case in the Nile valley before the Aswan dam. The trees grow rapidly in those areas. Logging is selective, so the forest as a whole remains and the same logger can cut new trees on the same spot twenty years later. Where the big multinational logging companies or the large timber companies from the south of Brazil move in the situation is quite different. They do not limit their activities to the floodplains but operate mostly on the highlands, where the soils are extremely poor and regeneration is therefore much more difficult. They also use heavy machinery, causing tremendous havoc, and often destroying the whole ecosystem. Since they are required to "reforest" they often cause additional damage outside the areas they exploit. The "reforestation" work, consisting only in commercial monocultures, is done by specialised companies and is done with tax rebate money. These companies often simply destroy native forest, burning all the timber, levelling the ground with heavy machines and then planting some fast growing monoculture. In general reforestation comprises only a fraction of the area destroyed and any control is lacking. The IBDF—federal forestry agency—is the most inefficient agency one can imagine for saving the Amazon or any other forest or ecosystem. Their work consists mainly in giving licenses for deforestation.

The Rubber Tapper

The *seringueiro*, or rubber tapper, like the Indian, has no sense of land ownership but he has a sense of territory. Each *seringueiro* has his "estrada" or road. He may walk as much as 30 km a day collecting the latex. Today he is no more the slave labourer that he was in the past. His transistor radio informs him on the rubber price in São Paulo or in Chicago. He makes between five and seven hundred dollars a month, as

much as a metal worker in São Paulo, but he has no expenses, and he derives all his food from the forest and the river. Yet the colonization programmes are displacing the *seringueiro* too, and another lifestyle compatible with the forest is being destroyed. Brazil imports two thirds of its natural rubber consumption of approximately 90,000 tons per year. By helping the *seringueiro* and by increasing the density of rubber trees in the forest, which has already been proved possible by some small private enterprises, Brazil could easily have enough natural rubber for export. The monocultures of rubber trees that are now being set up will probably not last long. They also require the heavy use of poisonous pesticides.

The *seringueiro* gets an additional income from the collection of Brazil nuts. He would be the ideal forest guard, requiring no pay from the government, and although it is true that the *seringueiro* contributed to the slaughter of Indians in the past, in many areas the rubber tapper and the Indian have learned to live together in harmony. During the last world war the central government, which then called the *seringueiro* the "soldier of rubber" (*soldado da borracha*) promised him title to the land on which he worked. This would have been very easy to implement. Each *seringueiro* needs no more than 200 to 500 ha. If the density of rubber trees in the forests is increased, he could make a good living on 100 ha. Of course the promise was never fulfilled. Now, when the *seringueiros* are displaced by the colonization projects they are given a small lot of 25 ha. They invariably sell the land and end up in the slums or as day-labourers on some big project.

The federal Government sees no difficulties in granting the rich title to tens of thousands of hectares, or even hundreds of thousands, but it will never give useful tracts of land to the small man. I visited one big project in Rondonia, where some 20,000 ha were being put into pasture and an area much bigger was being logged. On this project the company closed the road by which the *seringueiros* not directly affected by the project used to bring

out their rubber and instead forced them to sell all the rubber to the company at prices far below market prices.

Indians, *caboclos* and *seringueiros* are compatible with the survival of the forest. Their life style could easily be improved socially and ecologically by teaching them better cropping and collecting or fishing methods, storage methods and hygiene. Almost nothing is being done in that direction.

In Rondonia it is very easy to see how devastation, even when it is committed by "small" people, is always caused by the shortsightedness and greed of the powerful. The settlements now devastating the forest in Rondonia are part of a classical colonialist structure of dependence and export. In the new cities of Rondonia, growing like mushrooms, it is almost impossible to find locally produced articles in the shops. Everything, even the broiler in the restaurant, or the tomato in the salad comes from the industrial south. While enormous quantities of wood are burned in deforestation or left to rot on the ground, local power stations burn petroleum that is brought there from Santos by truck, travelling 2,400 km over bad roads and burning the equivalent of one tenth the transported oil on the way. The central electricity board will not allow large timber mills, like in Ji Parana, to do the job, despite there being sufficient wood tailings to fuel all the capacity required. Indeed where the Madeira river passes the capital of Rondonia, Porto Velho, one can see thousands of tons of wood, logs, branches, whole trees, floating downriver. There is no attempt to use that wood. On the contrary, when a region has to import everything it consumes, it must pay with exports, hence the reason for all agricultural research and development being geared to cash crops for export—rubber plantations, coffee, cocoa, rice, sugar cane and cattle.

The Vicious Circle

While unsustainable forms of agriculture are destroying the tropical rain forest, the regions in the south from where many of the migrants come, such as the fertile and deep

soils of Parana, Santa Catarina and Rio Grande do Sul, are going into soybean monoculture for export to Europe, the US and Japan. This soybean contributes to the "butter mountain" of the Common Market rather than feeding the hungry in the slums or the poor of the North East. Instead that monoculture contributed over the past twenty years to the destruction of the last forests of these once intact river basins. Similarly the process of monoculture is destroying the peasant type agriculture of the south, and vast tracts of fertile land that could support sustainable peasant agriculture are being emptied of its people. The few remaining farmers produce for the chicken factories. Much of this production goes to Saudi Arabia to pay for oil to feed the car orgy in the big cities. Food production in the formerly peasant areas has gone down drastically and prices went up accordingly. Even many of the farmers now eat vegetables imported from São Paulo. All this means still more petroleum consumption, still more exports.

If we promoted healthy organic farming methods on the soils that permit sustainable agriculture in the south—the same applies to the north east—then we could bring back all the migrants. We could easily solve all our food problems without having to diminish the present volume of exports. For, with all the paraphernalia of heavy machinery, soluble fertilizers and poisons, the areas with the most "modern" agriculture have a very low productivity per hectare. In the soybean-wheat monocultures, that now cover most of the fertile soils in the three southern states, average production is less than 1,000 kg wheat, and some 1,500 kg soybean per hectare per year. Peasant agriculture could produce at least five times more per hectare.

Amazonia and the Indians

Amazonia should be left to the Amazonians, it is theirs. The growth of capital or power at the expense of the ecology and the people of Amazonia is classical imperialism and it makes no difference whether the benefits accrue to powers from overseas or from other parts of Brazil.

It is often said, even by those who want to save the rain forest, that the Amazon can feed the world with fish protein. That is another illusion. There is enough fish for a growing local population but not for large scale export. The Amazonian rivers are incredibly rich in fish. There are more than one thousand different species. Many have not even been classified by zoologists. But there is very little primary production in most of the Amazonian rivers. Fish-life is mostly dependent on the forest, especially the forest on the flood plains. Many species feed on fruit or forest residues only during the high water season when they leave the river and spread out into the flood plain. The rest of the year they live off their fat reserves. All destruction of flood plain forests and also of the forests along the smaller waterways in the highlands contributes directly to diminution in water fauna. Even today there is overfishing. Some important species such as the pirarucú and the tambaqui are nearing extinction and the manatee is very close to extinction. Commercial fishing is extremely wasteful. It is now common practice for fishing boats to throw away whole loads of commercially less valuable fish when they hit upon schools of more valuable species. While fish for local consumption is caught locally, the commercial fishing fleets have control over thousands of kilometres, and in many areas the local population complains that it is becoming difficult for it to catch the fish it needs.

The Climate Issue

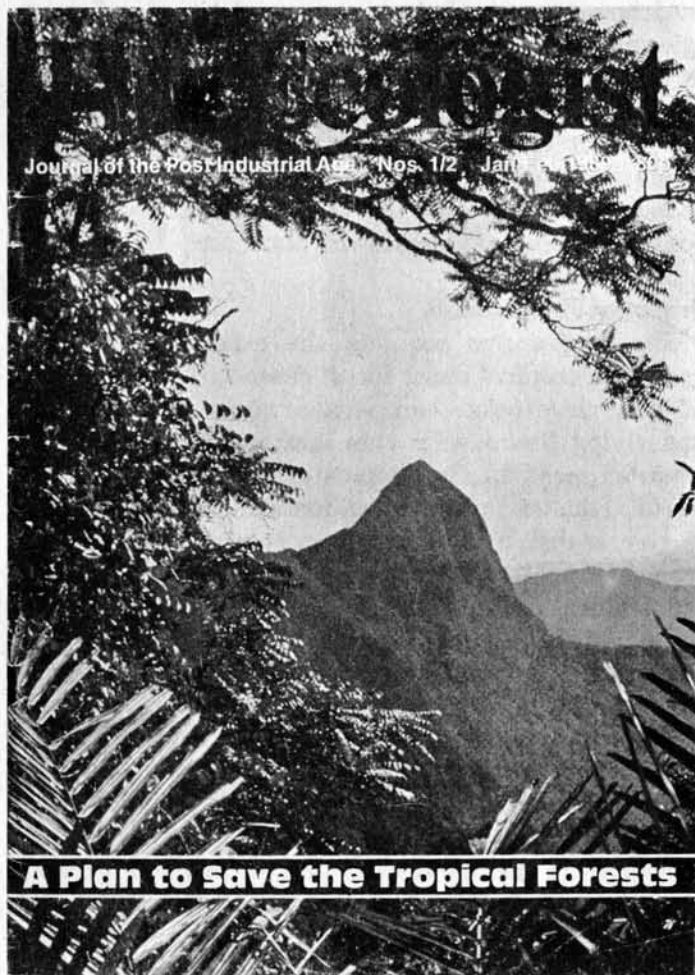
Studies such as those by Salati have shown that the climate that keeps the rain forest alive is largely self-generated. Evapotranspiration is so intense that 50 per cent or more of rain water is put back into the atmosphere. The water that falls on the slopes of the Andes has been recycled between five and seven times before it gets there. The whole system may break down if the chain is interrupted. If present rates of deforestation in the state of Pará continue much longer, then by the year 2000 the state may be completely deforested. At the beginning of the chain of rain recycling we will then have not heavy evapotranspiration but strong hot upwinds. The rainfall

pattern will change all along up to the slopes of the Andes. In fact the rain forest, with its very shallow root system cannot stand long periods of drought without dying. In this respect it is fundamentally different from savannah forests in which the vegetation has deep roots that reach water even during the dry season. Before it dies the rain forest becomes highly combustible. And as has been seen around Belém, a few weeks of drought gives rise to brush fires. The first fires may not kill the forest, but successive fires over a few years will kill it. A process of successive demolition may set in.

I have also observed another type of self-demolition process on some of the flood plains. In many areas some of the lower igapós are dying without being touched by chainsaw or defoliant. Deforestation in the upper Amazon basin, such as in Rondonia, unbalances the flow of the river. The igapó is a plant community adapted to a certain amount of flooding in certain months of the year. It now gets much more than it can stand, followed by increasing drought in the dry season.

A collapse of the rainforest or large scale deforestation, even if it causes no total collapse, will inevitably lead to a change in regional climate. It is difficult to see how a change in regional climate will not affect world climate. The Amazon rain forest is almost evenly spread into both hemispheres. The fresh water that flows and is recycled through this well-balanced system constitutes about one quarter of total world river flow. Together with the CO₂ balance, the O₃ layer, aerosols, dust, cloudiness and albedo, all of which are being systematically and blindly disturbed by modern industrial society, the Amazon rain forest is one of the important regulatory mechanisms of climate.

In our fight for ecological sanity we must always keep in mind that social justice and a healthy environment go together. Humanity will only abandon its present suicidal course when the masses become ecologically conscious and exert enough pressure on the powerful, whether they be multinationals, local oligarchies or governments of whatever denomination.



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A Plan to Save the Tropical Forests

Early in 1980, *The Ecologist* produced its World Ecological Areas Programme (WEAP) to save the world's tropical rain forests. Here the author, who is Director of the Smithsonian Tropical Research Institute, proposes a means of raising money in order to establish tropical forest conservation areas.

TROPICAL FORESTS: CAN WE AFFORD NOT TO GIVE THEM A FUTURE?

Ira Rubinoff

The tropical forests of the world are presently being destroyed at an unprecedented rate. Although hard data is lacking, the most conservative estimates put the destruction at eleven hectares per minute, and if this rate continues, virtually all undisturbed tropical forests will be eliminated early in the next century.¹ The remaining tropical forests will at best be transformed into forest plantations, thereby preserving soils and contributing to nutrient and water cycles, yet still reducing the diversity of plants and animals associated with natural forests. Many species will become extinct before we have recorded their existence or assessed their potential usefulness. The opportunities of domesticating or harvesting these organisms to alleviate current food problems will be lost forever.

The remaining tropical forests are located in three regions of the world: South and Central America, 45 per cent; Asia, Australia, Oceania, 19 per cent; Africa, 36 per cent.² Many of the nations possessing these tropical forests have been undergoing rapid development, and already Latin America has lost 37 per cent, Asia 42 per cent and Africa 52 per cent of their original areas of tropical moist forest.³

Destructive Forces: A strategy to stop them

There is a wide gamut of underlying forces responsible for the destruction of tropical forests, among them the commercial production of hard woods, pulp and charcoal; the clearing of land for forest plantations and cattle rearing; slash and burn agriculture, mining ventures and the gathering of firewood. Many of these pressures on tropical forests are a consequence of the attempt by developing nations to develop; the intention being to meet the needs of their human populations. Unfortunately developing nations find it impossible to stop on their own such destructive forces on tropical forests—the short term gains far outweighing the long term benefits of protecting such resources. If there is to be any chance of success in preventing the wholesale clearing of forests, developing countries will have to receive aid from outside.

The purpose of this paper is to propose a strategy that would preserve a sample of the world's remaining tropical forests through the establishment of an internationally financed system of Tropical Moist Forest Reserves. The preservation of large tracts of the world's remaining tropical moist forests would provide a solution, albeit partial to one of the most critical resource

destruction problems facing the world at the present time. The rapid rate at which the destruction is advancing and the irreversibility of its effects make the adoption of this plan an urgent need.

The problem is exacerbated by tropical forests becoming increasingly valuable as they become more scarce, thus providing the added incentive for developing nations with such forests to exploit them for foreign exchange. The proposed plan offers a viable alternative by providing the financial resources to make it possible for them effectively to protect their parks and reserves.

Numerous solutions have been proposed in recent years to solve or ameliorate the problems of tropical deforestation. These include: the adoption of a new worldwide economic order; increased cooperation among nations to protect valuable resources; increasing the commodity price of timber through the formation of hardwood-exporting cartels; the rental of tropical forests by developed nations; increased research and development on tropical forest resources; increased education and public awareness about tropical forests; development of alternate technologies to reduce the demands for tropical forest products; and an attack on the cause of the pressures upon tropical forests including poverty, underemployment, food and energy deficiencies and uncontrolled population growth.⁴

Global strategies, such as the UNESCO's Man in the Biosphere Programme, aiming to establish a worldwide system of biosphere reserves representing samples of major ecosystems from nearly 200 different biotic provinces,⁵ and the World Heritage Convention, establishing a system of natural and cultural sites of "outstanding universal value", registered on a World Heritage List, and conserved if necessary with assistance from the World Heritage Fund,⁶ encompass broader objectives than the preservation of tropical forests, and fail to provide the initiative for participation, particularly amongst developing countries. In 1980, the I.U.C.N. published its World Conservation Strategy—a long-term plan for preserving the world's living resources.⁷ But the course of action for the establishment of reserves depending on voluntary contributions from those industries and commercial enterprises that derive benefits from the forest, seems weak in view of the amount of financial support required.

One of the most promising studies purporting to deal with the problems of future resources is *Global Future: Time to Act*, published in 1981 by the Council on Environmental Quality and the Department of State (USA). A series of refreshingly specific recommendations are made in order to counter the loss of biological diversity in certain ecosystems. Most significantly, this report recognizes the need for the richer countries "to pay part or all the costs of protection and management of critical areas that are unique to mankind".⁸ However, the amount suggested for establishing an international fund to assist developing nations in managing reserves—one billion dollars over ten years—is clearly insufficient to have a significant impact on the future of tropical forests.

Although most of the recommendations and strategies proposed embody admirable objectives that need to be urgently pursued they are neither individually nor collectively capable of being pursued in time to counteract the accelerating rate of deforestation. While these plans remain unimplemented immediate economic exploitation in the developing countries possessing tropical forests will continue.

Proposed Programme

The programme requires the establishment of a system of tropical moist forest reserves financed by all of the developed temperate zone nations. The underlying premise for this strategy is the fact that what happens in the tropics affects the rest of the world. Thus not only will industrialized nations have to pay higher prices for raw materials derived from tropical forests that are rapidly becoming depleted, but tropical deforestation is likely to have an impact on climatic and hydrological balances in temperate countries. Unfortunately, our understanding of the relationship between tropical deforestation and climate is imperfect and significant changes such as those which are described by Gentry and Lopez-Parodi for the Peruvian Amazonian region are still being debated.⁹ Intensified seasonal flooding, water shortages in the dry season, loss of cropland, growing scarcity of fuelwood and forest products—all seemingly correlated to forest disturbances—affect the quality of life of the people in developing countries and are potential causes of political instability. The social unrest in El Salvador can be partly attributed to such trends. There, forests converted to poorly controlled agriculture resulted in soil erosion and eventual loss of land productivity. Inevitably a diminishing agricultural base produced economic hardships, followed in turn by extreme political instability.¹⁰ The situation described is not unique to El Salvador, and emphasizes why the participation of temperate zone nations in the proposed programme should not be regarded as altruistic but rather self-serving, a vaccination now against potential future infection.

In effect, we have been paying the oil-exporting nations for more than the cost of finding, extracting, transporting and refining oil: so that they have something in hand when the oil runs out. My proposal is that the developed nations pay now for their own future security, by investing in a trust whose aim is to protect the diversity of life embodied in the tropical moist forests of the world.

The payments for this system of reserves must not be in any way an attempt on the part of the rich nations to meddle in the internal affairs of the developing nations. Participation in the programme must be voluntary, and should in no way affect these nations' sovereignty over their forest reserves.

According to the proposed plan, each host nation would receive annual payment, the amount based on the area under protection, in return for its acting as custodian of reserve areas of tropical moist forests. Maintenance of the reserves would be monitored by annual inspections. If the area under protection has been reduced or there were more squatters than initially

specified, then the payments to that host nation would be substantially reduced. Thus, there would be a direct economic incentive for rigorous protection of the reserves.

The funding each nation receives would be based on the area registered as part of the Tropical Moist Forest Reserve System. In instances when forestry or park services in the registering country cannot absorb the large amounts of external funds, it might prove necessary to first finance small technical assistance programmes to build up the infrastructure of the organization charged with the custodianship and management of the reserve system within a particular country. However, the funding that a nation receives would exceed the requirements of simply developing the infrastructure of national park or forestry conservation services in the participating countries. The proposed funding should cover the intensification and diversification of agriculture in other areas so as to ease the pressure on the reserves to provide new agricultural land. Funds could also be used to establish plantation forests in other areas in order to provide employment, firewood, and other needed forest products. They should also be sufficient for public education programmes in the participating nations so as to broaden acceptance of the concept of forest preservation and to develop respect for the reserve's borders, rules and regulations.

When participating nations lack sufficient technical personnel to prepare the necessary surveys for registering their new reserves, a programme of "start-up" grants should be administered to employ consultants who would prepare surveys, maps, inventories, legal reviews of the relevant local and environmental laws, and new legislative packages where these are prerequisites for participation.

Clearly detailed surveys and inventories will not be accomplished in the relatively short-term allotted for preparing the registration documents—this would normally require a long-term activity of research and analysis of each reserve. Nor should it be necessary to undertake extraordinary measures to ensure that the areas selected for protection will include the maximum diversity of an area. To do this would require extensive biological surveys for which there are insufficient biologists. In many cases, experience has shown that an area that represents maximum diversity for a mammalogist may be relatively dull for an ornithologist or lepidopterist. It would seem more important that reserves be selected from among those undisturbed areas for which there are a minimum of conflicting development plans. The preparation of the application for inclusion in the system, would require approximately one year—less for reserves where much of the requisite data already exists. Registration would be left open for approximately five years after the programme is initiated or until the goal of 1,000 tropical moist forest reserves of approximately 100,000 hectares each is established. Some reserves will be considerably larger, as in the Amazonia, for example, where the Brazilian government is already establishing reserves, some of which are over 1,000,000 hectares. Others may be considerably smaller.

Accomplishment of the Plan

A goal of one hundred million hectares of the world's tropical moist forests established into a system of effective and carefully monitored reserves, and financed by contributions from the developed nations may seem ambitious. Actually, this represents only about ten per cent of the remaining tropical moist forests. The proposed plan for a system of tropical forest reserves will not stop the process of deforestation. What would be accomplished instead would be the establishment of a safety valve. Some diversity is preserved; some options for the future are maintained. This programme is not intended to replace international conservation programmes aimed at specific endangered species or habitats.

It is hoped that development projects financed with revenues from the programme might more efficiently provide products and materials that might otherwise be removed from undisturbed tropical forests by unplanned or non-renewable methods. Indirectly, the programme would contribute to the preservation of an area greater than the ten per cent of the tropical moist forests that the plan encompasses.

One criticism of the proposed scheme is that it could, by its existence, take pressure off extant national programmes, encouraging nations merely to register parks and reserves they had planned to declare anyway. That may not necessarily be bad. Economic realities and/or the low priority given to conservation commitments often result in the establishment of "paper parks" in developing countries. The registration of a previously planned park in the new programme would at least ensure its protection. The revenue derived would help capitalize other immediate programmes and perhaps contribute to an environment in which conservation imperatives receive a greater priority and are more broadly appreciated within the nations.

There are about one thousand national parks, from the equator to the poles, listed in the 1980 *United Nations List of National Parks and Equivalent Reserves*.¹¹ Unfortunately, in compiling this data, it was found that the information regarding the "area of some of the parks varied by as much as 50 per cent depending upon the source of information", and the compiler of the list for the United Nations claimed there was too little data available in order to judge the quality of management of the reserves on the list. Parks and reserves presently make up less than one per cent of the remaining tropical forest biome, and even that one per cent is at risk.

Funding for Implementation

The financing of the International Tropical Moist Forest Reserve System will be provided by those developed nations with per capita gross national product in excess of \$1500 per annum.¹² For the purpose of this plan, a system equivalent to a progressive income tax (beginning at \$0.50 for GNP \$1500, to \$5.00 for GNP \$10,000 and above) on all nations with a GNP over \$1500 and not possessing tropical moist forests, would yield over three billion dollars annually (\$3,259,000,000). This system would require support

from twenty-three of the nations in the Organization for Economic Cooperation and Development, OECD, (\$2,613,000,000), seven nations with Centrally Planned Economies (\$556,000,000), seven of the Organization of Petroleum Exporting Countries, OPEC, (\$89,700,000) and six other developing or middle-income countries with GNP over \$1500 (\$53,000,000). (See Table 1). To assure continuity for the programme, the international resource mobilization must become automatic, independent of the goodwill of the individual contributors, and flow through an international multilateral institution. Although this seems a great amount, it represents only a relatively small increase in the development assistance provided by the OECD nations in 1980. For some countries, with the proposed additional contribution, the increase would still be below the 0.7 per cent of GNP target for development assistance proposed by the United Nations.

Planned economy nations should not continue to shirk their responsibilities to contribute to this type of programme. Whatever their contemporary perception of the contribution of the West's former colonialistic or imperialistic policies to the economies of tropical nations—the problem of deforestation will affect all nations; all should contribute to this plan, regardless of ideology.

The formula used in deriving the amounts to be contributed annually by each participating nation may be improved if a more equitable one can be derived. In addition, special arrangements may have to be made for those countries with particularly awkward foreign exchange situations. Several industrialized nations may wish to take additional steps unilaterally to protect the relatively small amounts of tropical moist forests under their custodianship. For example, Australia has about 6,000 km² of moist forest remaining along the east coast of Queensland; and the United States could adopt a more aggressive policy toward protecting some of the remaining forested areas in the Hawaiian Islands.

Nations classified by the World Bank as middle income nations and also possessing tropical moist forests, such as Brazil, may wish to participate in the programme both as a contributor and a receiver of support from the International Tropical Moist Forest Reserve System. (For the purpose of this model, most nations possessing tropical moist forests are excluded from the calculations of income. However, if Brazil and Venezuela choose to contribute, as well as register reserves, an additional \$74,000,000 would be available.)

An Administrative Framework

The specific mission of administering the programme would require the establishment, inspection and disbursement of payments for tropical moist forest reserves. A new institution such as the World Development Fund proposed in the study, *North-South: A Programme for Survival* could be a possibility.¹³ However, the machinery for this has not been established, and once it is, it will be concerned with all aspects of development. It thus could easily

TABLE 1

SOURCES OF FUNDS FOR THE PROPOSED INTERNATIONAL TROPICAL FOREST RESERVE SYSTEM

Organisation for Economic Cooperation and Development

	Population (A) (million)	GNP/ capita (B)	Contribution /year (C) (million)	Devel. Asst. (D) (million)	% Increase (E)
Australia	14.2	7,990	49.7	690	7
Austria	7.5	7,030	26.3	174	15
Belgium	9.8	9,090	44.1	714	6
Canada	23.5	9,180	105.8	1,151	9
Denmark	5.1	9,920	23.0	448	5
Finland	4.8	6,820	14.4	104	14
France	53.3	8,260	213.2	3,836	6
F.R. Germany	61.3	9,580	275.9	3,581	8
Greece	9.4	3,250	14.1		
Iceland	0.2	8,390	0.8		
Ireland	3.2	3,470	4.8		
Italy	56.7	3,850	85.1	320	27
Japan	114.9	7,280	402.2	3,070	13
Luxembourg	0.4	10,540	2.0		
Netherlands	13.9	8,410	55.6	1,547	4
New Zealand	3.2	4,790	6.4	65	10
Norway	4.1	9,510	18.5	491	4
Portugal	9.8	1,990	4.9		
Spain	37.1	3,470	55.7		
Sweden	8.3	10,210	41.5	1,125	4
Switzerland	6.3	12,100	31.5	218	14
United Kingdom	55.8	5,030	139.5	2,453	6
United States	221.9	9,590	998.6	4,567	22
Subtotal—\$2,613.6					

Organisation of Petroleum Exporting Nations*					
Iran	35.8	2,160	35.8	21	170
Iraq	12.2	1,860	6.1	861	1
Kuwait	1.2	14,890	6.0	1,099	1
Libya	2.7	6,970	8.1	146	6
Qatar	0.2	12,740	1.0	251	1
Saudi Arabia	8.2	7,690	28.7	1,970	2
U. A. Emirates	0.8	14,230	4.0	207	2
Subtotal—\$89.0					

Middle Income Countries					
Argentina	26.4	1,910	13.2		
Hong Kong	4.6	3,040	6.9		
Israel	3.7	3,500	5.6		
Singapore	2.3	3,290	3.5		
Uruguay	2.9	1,610	1.5		
Yugoslavia	22.0	2,380	22.0		
Subtotal—\$52.7					

Centrally Planned Economies					
Bulgaria	8.8	3,320	13.2		
Czechoslovakia	15.1	4,720	30.2		
German D.R.	16.7	5,710	41.8		
Hungary	10.7	3,450	16.1		
Poland	35.0	3,670	52.5		
Romania	21.9	1,750	11.0		
USSR	261.0	3,700	391.5		
Subtotal—\$556.3					
Total—\$3,259.0					

Data from *World Development Report, 1980*; The World Bank. (A), (B) adapted from *World Development Report, 1980*, The World Bank, Table 1, pp 110,111. (C) calculated on a scale of GNP

\$0-1500	— 0	\$7-8000	— \$3.5
\$1500-2000	— \$0.5	\$8-9000	— \$4
\$2-3000	— \$1	\$9-10,000	— \$4.5
\$3-4000	— \$1.5	\$10 +	— \$5
\$5-6000	— \$2.5	C — A x B Scale	
\$6-7000	— \$3		

(D) adapted from *World Development Report, 1980* Table 16; *ibid.*

(E) % increase in development assistance E — C (100)
D

*Includes countries with a GNP in excess of \$1500 per capita and excludes countries with a significant Tropical Moist Forest habitat.

fail to provide immediately the priority necessary for preserving the rapidly diminishing tropical forests.

Of the traditional agencies, the World Bank might be the most suitable to undertake the additional responsibility for establishing and financing a large network of protection areas. An advisory committee of experts from organizations such as FAO, UNESCO, UNEP, IUCN and WWF might be established to assist the World Bank with technical matters pertaining to the programme and to lend their weight to encouraging the developing nations to subscribe.

The World Bank has as its purpose the provision of funds and technical assistance for facilitating economic development in its poorer member countries. It has global reach, and could establish an ancillary division devoted to disbursement of payments to participant nations. The Bank would be in an excellent position to provide technical advice and additional loans, where necessary, to combine with the revenues from reserve payments for other development projects in areas such as agriculture, reforestation, afforestation, restoration of eroded lands, colonization schemes, forestry training, land surveys, and institution building. The Bank has already a developed philosophy towards forestry development, and it understands the role of human encroachment, principally from unplanned or poorly planned agriculture in the destruction of tropical forests.

Some of the management of the programme could be accomplished through the Bank's extant system of regional offices, some of which are located in countries with important areas of the world's remaining tropical moist forests, e.g., Cameroon, Ghana, Ivory Coast, and Zaire in Africa; Indonesia and Thailand in Asia; and Bolivia and Colombia in South America. The Bank already conducts periodic reviews of borrower countries' economic situations and credit worthiness. This process could be modified into an inspection procedure to ensure compliance with agreed-upon specifications for reserve management. When the inspection missions find that the safeguards are inadequate or that they have been ignored, then the halting of disbursements must follow. Supervision of compliance to the agreement of protecting tropical moist forest reserves must be firm if the system is to achieve its proposed objective.

If for some reason the World Bank is inappropriate or disinclined to take on this mission, then clearly a new international agency must be developed. With broad and immediate support from the interested nations, this is a plan that can be implemented almost immediately, with major components in place within three years, under ideal circumstances.

Initially, the programme will be applied only to natural, unmodified, tropical moist forest ecosystems. Later, as more subscriptions to the programme from the developed and middle-income nations provide the financial sources, auxiliary reserves may be added. The International Moist Forest Reserve System would accept registration applications from the following nations (broadly defined): *South and Southeast Asia and Melanesia*: Australia, Bangladesh, Brunei, Burma, Indonesia,* India, Kampuchea, Lao P.D.R., Malaysia,*

Melanesia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Viet Nam; *Tropical Latin America*: Belize, Bolivia,* Brazil,* Colombia,* Costa Rica, Cuba, Dominican Republic, El Salvador, Ecuador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru,* Puerto Rico, Suriname, Trinidad-Tobago, Venezuela;* *Tropical Africa*: Cameroon, Congo, Gabon,* Ghana, Ivory Coast, Kenya, Liberia, Madagascar, Nigeria, Sierra Leone, Tanzania, Uganda, Zaire.*

An enormous area is contained within the political entities just listed; unfortunately, in many cases, the remaining tropical forests have already been disturbed and grossly disrupted (e.g. Madagascar). There are remnant forests in all these countries which should be preserved but 80 per cent of the world's tropical forests are found in the nine countries asterisked (*) above and they would form the core of the new programme.

Is the Programme Feasible?

There is clear-enough information about the seriousness of the conversion of tropical forests to justify the common interest of all nations in the selection and establishment of the forest reserve system. What is now needed is a breakthrough in the global stalemate—one that will make a significant contribution to the world's stability in both economic and ecological terms. Is this possible?

Ten years have passed since the authors of *The Limits to Growth* presented their World Model of the relationships between industrialization, population growth, malnutrition, depletion of nonrenewable resources and the deterioration of the environment.¹⁴ Their models generated much criticism and many world conferences, but very little in the way of new national or international policies designed to develop or even to question the need for viable alternatives to a global growth economy. Its publications did produce an increased awareness that some resources may be reaching scarcity levels by the end of the century, and that the limited regeneration potential and carrying capacity of the world's ecosystems might impair the quality of life inhabitants of the developed nations of the world have come to expect. Many subsequent examinations of aspects of the global resource base have been published and, undoubtedly, more are in the pipeline. In 1980, the Independent Commission on International Development Issues (The Brandt Commission) published its report that dealt with a variety of problems arising from the disparity between the nations of the developed North and the generally less developed South. A good case was made for the participation of the developed world in a World Development Fund which would be the mechanism for transfer of assistance funds designed to speed the development of Third World nations and reduce the extent of world poverty. In spite of the advantage and long-range economic self-interest that would accrew to the developed world by stabilizing the markets of the Third World, there has not been a rush to adopt the Brandt Commission Report.

Since the 1967 Charter of Algiers, the plethora of international world conferences has not succeeded in developing an operational system that would compensate the developing nations for the costs of maintaining their environments at the expense of trade and development.¹⁵ However, action on the part of the developed nations to protect the world's environment is not entirely without precedent. The worldwide alarm developed over radioactive fallout after the 1954 series of U.S. hydrogen bomb tests resulted in a Partial Test-Ban Treaty that prohibits detonations of nuclear weapons in the atmosphere, under water, and in outer space. In force since 1963, this treaty, at least for those nations possessing nuclear weapons, must be an expensive concession to the world's environmental quality and to their own future generations.

Some people have argued that the problem of tropical deforestation and other environmental issues are unimportant, if we fail to control the nuclear arms race. Let us consider what the future will hold if somehow the world muddles through without a nuclear conflagration. Will the environment be liveable? Will we be able to feed the growing global population? We cannot afford the luxury of dealing with only one problem at a time. The problem of tropical deforestation is not deferrable.

Certainly, it will be difficult for the developed world to help developing countries in any appreciable way until the threat for not doing so is immediate and personalized to the extent that the quality of life of the developed nations is immediately at risk or already seriously deteriorated. Three billion (or three thousand million) dollars annually will not easily be parted with, particularly at a time of high inflation and reduced government spending.

However, the time has come to move from the plane of identifying the problem, i.e. the rapid rate of tropical deforestation, to a sphere of action. Unlike our forefathers, modern man will not be able to plead ignorance of environmental degradation and subsequent loss of biological diversity in the tropics; we have been duly alerted. What is necessary is the concerted effort of international conservation organizations and government environmental agencies to put into practice the proposed plan or a somewhat modified version of the same. Leaving politics aside, the nations of the world that can afford to do so should invest now in this plan to preserve tropical forests for the future, and thus prevent the loss of our biological heritage and a forthcoming natural resource crisis.

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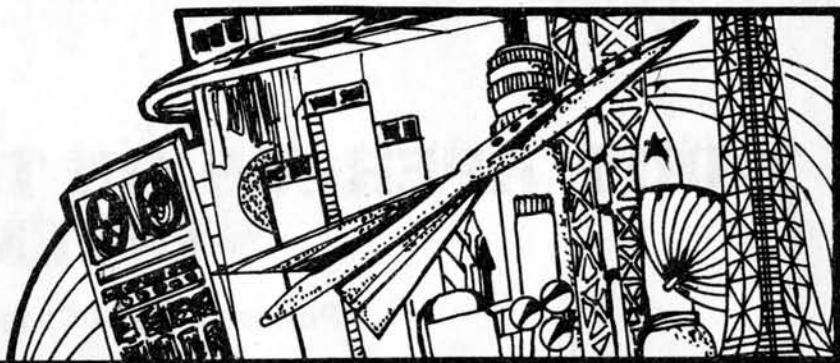
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THREE APERÇUS ON THE INDUSTRIAL SYSTEM

Professor Hans Sedermaier

The transition to an industrial system, measured by world-historical periods, has taken place with lightning speed, and constitutes the most profound change in the total condition of mankind that the history of this earth has witnessed. A comparison between the 'condition humaine' of 1780 with that of 1980 shows the extent of the change incontrovertibly. Not even the transition from the existence of the hunter-gatherer to that of settler, penetrated so deeply. The industrial system is no stationary condition but a process. The following passages elucidate three steps in that whole movement.

First Aperçu

The old 'Technique' including that of the 19th century was 'Techne', hence a specific ability. It proceeded from a simple formula: "I wish for something, I have certain aims and I will see to it that what I wish for, I shall attain precisely and successfully. Every technique demonstrates success in the effort to bring about that for which I wish." Technique in that sense exists even today, in the most up-to-date forms and with the most modern means: the most spectacular example is the successful landing on the moon.

The power machine invented by James Watt in 1768 and sold by Matthew Boulton is something quite different and with it an interior re-structuring of the thought of the time silently took place. Such restructuring derives from the thought process. "I do not want anything definite, or need therefore to procure a definite means; instead I first create a potential—a concentrated power—and then ask the question, what can I do with it? Or even, and this would be the ultimate perversion of the original position, I allow my aims to be decided by the means over which I dispose. I want something because I am able to create it; discover potentials, create potentials for any possible aims." That is the new formula from which the whole new technique, from the steam-engine to electricity and beyond to the power of the atom, develops.

This process had begun when Boulton said to James Boswell, "I sell here, Sir, what all the world desires to have — POWER."

In English the word 'power' has overtones of both strength and might. The reason for the new technique is not primarily for use, but for power. He who has at his disposal the materials from which power can be obtained and also the 'known-how' by which to use it, has power. Knowledge is power. Hence in one step, the demand for power leaves the political sphere for that of the scientific and technical. This new power has two patrons—war and profit, (what Ezra Pound called 'usura'). Driven by those two, it has grown to unthought-of dimensions and achieved the unimaginable, but it has also progressed to an unheard of accumulation of destructive weapons and the amassing of monetary power.

Where the means rule aims a boundless process begins, but when aims, themselves *ipso facto* limited, rule means, the reverse is true. Where means are uppermost, extreme situations are created—such as that of 'Overkill' where the aim is manifestly irrational. Another similar extreme situation is shown through the monetary power of the great 'Maltis' being already as great or greater than states themselves.

Second Aperçu

Within the industrial system a shift in the emphasis in human

existence is observable—human intellectual activity and human work move towards the enormous realm of the inorganic.

The same observation was made by André Varagnac: "Mais au total (de l'histoire universelle) trois grands faits se dégagent: les peuples chasseurs-pêcheurs-ramasseurs sont fondamentalement orienté vers le règne animal. Les peuples pasteurs—agriculteurs ont principalement affaire au règne végétal (secondairement à l'animal domestiqué). Enfin nous, modernes, sont essentiellement tournés vers la matière inanimée."

This shift towards the inorganic is a rapidly accelerating process. An example of the speed is the growing mass of inorganic material which surrounds us in a thousand forms. More and more objects around us, formerly made from organic material, are being replaced by those of an inorganic and synthetic nature. That movement follows two directions: organic material is replaced by the inorganic and synthetic—organic power by inorganic power. The same phenomenon can be observed in the life of man. Up to the industrial revolution only small groups of men were occupied with inorganic matter—they were mostly miners and smiths. Today in industrial civilized countries 90 per cent of the population work in the inorganic sector.

As the culmination of an ever-increasingly inorganic environment;

factory landscapes stretch out over the land—radiating through wires and nails an inorganic network over the earth.

This process has two roots: one rational, the other irrational. Rationally, inorganic matter and inorganic power are more easily manipulated than living material. The irrational aspect is grounded in the sheer magical 'rapport' with the inorganic in which the modern man finds himself and explains its absolute dominion over him.

Further, continual occupation with the inorganic engenders new sets of ideas, new methods of work and behaviour, all related to this 'Ersatz-natur', but strange and inimical to real nature. Here is the main reason for the 'environment crisis'—its real name is de-naturalization. It lays hold not only of age-old cultivated land and its people but also of the whole of nature, the desert, the oceans and the heavens. This process is not limited to the environment but includes also the de-naturalization of man himself—up to the point of the idea of breeding a type of human being by gene-

mutation who would be better suited to the needs of 'Technique' but who possibly could no longer be called a man.

There is no limit to be seen in the shift of human existence towards the inorganic and its unavoidable consequences.

Third Aperçu

Francis Bacon sought the aim of science, not in the search for truth and the fullness of the spirit, but in the increase and evaluation of its results. In the three modern inventions of the compass, gun-powder and the printing-press he saw not a progress but an introduction to a world power of unforeseeable effect. The 'humana potentia' can 'novam naturam sive novas naturas generare.' In the introduction of that process Bacon saw the 'maximus partus historiae'.

No limit can be set to this process. Bacon summoned the researcher, who "from an unhealthy sense of prudence and misapprehended moderation" was afraid that men might research too far, to "press on fearlessly to unending progress." Research and technique have obeyed

that summons to this day.

In a publication of the Royal Society which regarded Bacon as a Moses leading to the Promised Land, it was announced that scientific knowledge was to be used for the "increase of human power."

In his letter of dedication Charles II, referring to Bishop Spry, writes that "a higher degree of reputation is due to the discoverers, than to teachers of speculative doctrines, nay even to conquerors themselves. Nor less has the true God himself omitted to shew his value of Vulgar Arts." For "in the whole history of the first Monarchs of the world, there is no mention of their victories" but indeed "a Sacred Remembrance for one Natural and Mechanical invention."

Nowadays there is an obvious tendency to put the whole of education in the service of the industrial system. Beginning in primary schools through the secondary schools up to the universities where the philosophy of natural sciences has to give way and even history is in retreat—we have a complete de-humanisation of knowledge.

LEGITIMISATION FOR A FAILING SYSTEM

John Robinson

Recent articles in *The Ecologist* ("Thermodynamics or Ecodynamics" and "Superscience—its mythology and legitimisation") have provided a critique of attempts to apply inappropriate theories, such as the thermodynamic concept of entropy, to the ecosphere and to human society. The author, Edward Goldsmith, can be taken to task for his tendency to consider scientists as holding one common viewpoint—and not a very sensible one at that. Possibly we could also continue to debate the many works of "superscience" and pseudoscience in detail. But it may be of greater value to consider why so much obvious nonsense is being propagated at this time, and then to return to a more rational discussion of the real world and to the many problems to be solved there, and thus to refuse to be diverted into arid intellectual cul-de-sacs. We will not then bother to deal in any detail with strange suggestions such as that by Prigogine that "a new molecular order" may appear in a fluid heated from below, once a Benard Convection occurs. Rather we wish to note the source of the logic in the propagation of such ideas.

Why claim for example that society is becoming ever more complex, when the overall pattern is becoming

simpler with increasing interdependence and a uniform economic evolution in all countries of the Western world? Why the argument that change has become too fast to keep up with, at a time when economies are grinding to a halt? Is this an effort which intends to confuse and to lead us all to consider ourselves incapable of understanding, confused and powerless, alienated—and thus unable to decide on the need for a fundamental change in our society?

The choice is increasingly between philosopher of the free market, Freidrick Hayek, who believes that an economy is neither controllable nor predictable but rather "a process which brings millions of events into coordination, which never could be achieved deliberately," and economist Milton Friedman, who in 1973 predicted the breakdown of OPEC and rapid return of oil prices to previous levels, and others such as Ernst Mandel, who in the early 1960s correctly forecast the economic depression of the 1970s together with high inflation rates as *necessary* for system survival, as well as Jay Forrester and co-workers, whose computer model of the economy generates and describes the long "Kondratief waves". Is it trivial to

suggest that we apply basic scientific criteria and listen more to those who are able both to describe accurately our present situation and to correctly forecast events, and to dismiss the arguments of those who are so consistently wrong—including the economists and politicians who for a decade have been suggesting an upturn in the economy “next year”?

Where is the source of the logic in both the modern economic pronouncements and in the various curious pseudoscientific theories? The answer is to be found in a system's behaviour. The first goal of any system is to remain in existence. While a system is healthy and appropriate to the historical situation (even if failing to satisfy criteria such as justice and liberty), reality may be described clearly and simply—there is a fit between paradigmatic perception and the physical world. But once a system is inappropriate, failing and under attack, it will set up a number of protective mechanisms. The role of the pseudoscience criticized in recent issues of *The Ecologist*, and of official economics, is two-fold: the legitimisation of the status quo, and the production of diversions to draw attention away from the obvious failure of the system and the need to make substantial changes in the system. This is systemic self-protection.

Thus the rather strange and mystical “invisible hand” of capitalism was introduced not to suggest a new and better (?) system, but to legitimise a situation of great inequality and injustice already in existence. Economic theory often then *follows* economic development, with the major exception in recent times of Marxist analysis.

Let us consider recent economic developments, not forgetting the basic scientific principle that *cause precedes effect*, that we must look for the cause of a breakdown in the events that come before that breakdown. The first major signs that something was seriously wrong with the Western system were the social unrest of 1968 and the move away from the gold standard in 1971. What were the major trends in the economic system at that time?

World production was growing at an average of 5 per cent per year in the period 1948-73, while value added in industry increased at more than 6 per cent per year.

World trade had grown at a rate of almost 50 per cent greater than world production, at almost 7.5 per cent per year.

International finance was needed to provide for this increasing economic activity, and much of this has been created in the international sphere, out of the control of any national government. Thus international liquidity jumped by a factor of about 3.4 between 1969 and 1977, at an average rate of 16 per cent per year, while the stock of Eurodollars increased by a factor of 6, at an average rate of 25 per cent per year; surely an inflationary development.

The velocity of the circulation of money doubled between 1945 and 1967, reaching the rhythm of the year 1929 once again.

The strengthening of international contacts led to increasing interdependency, towards a uniform “one-world” system, increasing the probability of a resonant breakdown.

Multinational corporations expanded rapidly from about 1967 onwards. Several technological developments made this expansion possible: world-wide travel, world-wide communications and increasing computer capabilities.

It is interesting to note that all of these factors which led into the present depression are being touted as solutions to our problems: more production capacity, more trade, increased interdependence, more development of new technology.

Since Mandel was able to correctly forecast the depression, it would seem sensible to consider his reasoning and to derive from that an alternative set of policy options. Large scale, long period fluctuations, often referred to as “Kondratieff waves”, have been observed in the Western economic system since about 1795, each positive and negative part of the cycle being of about 20-25 years duration. Mandel insists that different factors may play a part in each cycle, but a simplified description of the systems behaviour, which accords with the computer modelling of Forrester, is as follows. During growth there is an expansion of credit and production which eventually leads to overcapacity, overproduction, too much investment. After a period of slump during which time wages are driven down by low profits and unemployment, the excess capacity is used up, and a new expansionary phase can begin.

The period of economic depression is characterized by social unrest, moves towards more totalitarian forms of government as the population feels bewildered and threatened, and the increased probability of warfare. It must not be forgotten that Nazi Germany came out of the previous depression, and was the first western country to expand its economy. Many such present-day developments were forecast in the early 1970s.

The cause of the economic collapse is that of an uncontrolled system suffering from an excess of success, as an engine that has overheated from racing too fast. The conventional wisdom which calls for “more of the same” fails to recognise this basic fact.

The solution to economic problems may be linked to environmental and social concerns. The key lies at the heart of the system, with the means of control. Decisions made on a basis of individual greed wreck the environment and cause direct human suffering as well as forming the basis of a malfunctioning economic system. The danger facing us in the next decade is that our society may continue to follow the same path as in the past. It has been possible to forecast economic depression, inflation, calls for strong government, environmental degradation, unemployment, social unrest and growing disparities between the rich and the poor. Is the forecast of war evolving from this explosive mix also going to follow?

In recent times many analyses paint a gloomy picture, yet withdraw from the suggestion of a solution. What is needed first is an increase in self-confidence. The solution can only be found by recognising the facts of the situation, in accepting that a major change is needed in our political system and in debating the new forms required. This is as true for

environmental concerns as for economics. For example, how can multinational corporations be stopped from ruining the earth unless the corporations are removed completely? Is it possible to control them in a capitalist, "free-market" system? I believe not.

An obvious feature of the economic system is the control of finance by a group with a strong stake in the status quo. Thus in large-scale projects on the global problematique, attitudes derive from the source of funds and suggest a continuation of the present system. Prestigious prizes from the establishment also go to establishment thinkers—all three of the "emperors with no clothes" noted here, Prigogine, Hayek and Friedman, have Nobel Prizes, as did Leontief who falsely claimed that his modelling for the United Nations had disproved the Limits to Growth. Thus "experts" are both created by the system and used by the system for legitimisation purposes.

There is a trap of a concept of disciplinary expertise which demands a refusal to cross a discipline boundary into unfamiliar territory. This, as well as unstated political priorities, leads to considerable auto censorship in most studies of global problems. We must be prepared to ignore this trap, to follow a problem wherever the analysis may lead, studying new disciplines as required and formulating an interdisciplinary approach which alone can lead to the required understanding. For that reason I have chosen to discuss economic theories in *The Ecologist*, a journal of environmental concerns. It is important to comprehend the total system within which we live and to

refuse to be distracted from the major problems of our time by red herrings.

We are today locked into a system which in its behaviour brings periods of social disarray and conflict. For centuries depressions have been an unwanted side effect of a successful evolution in man's knowledge. This system cannot handle progress now, any more than during the earlier period of the industrial revolution, when life in the countryside of England was broken up, and misery grew in city slums. With man's increasing power comes an increasing ability to wreck the environment, drive other species into extinction, produce an economic system in which a majority are alienated or unemployed, and wipe out the human race.

A new system of control of the economy, including the means of production and distribution, demands a collective response, a form of socialism appropriate to our time, recognising that in the overdeveloped world economic growth is no longer a major priority. The development of self-reliance in communities and nations, a lesser emphasis on trade and competition, a dismissal of narrow concepts of productivity and efficiency, the withdrawal of power from giant corporations, a demand for collective responsibility and control, are required.

Is it possible to forecast the coming decade? I see none of the above criteria being satisfied. Our only hope is in being able to work through the inevitable period of conflict and to use it profitably to develop a new and better system, just as World War I led to the breakup of outdated empires and World War II to the end of colonialism. If we survive, that is.

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How Fares the Environmental Lobby against President Reagan?

Immediately after last November's Federal elections which increased the number of Democrats in the House of Representatives, President Reagan responded by predicting that both he and the opposition would have to make concessions and compromises on major issues in the next two years. It will be interesting to see if the Reagan Administration will be prepared to change its negative attitude to environmental protection.

On assuming power in 1980 Ronald Reagan promised radical changes in legislation and programmes including environmental controls and standards. Part of the President's 'New Beginning' was to be a curbing of the expansion of Federal Government by returning powers and responsibilities to state and local governments. This delegation of power sent a shiver of apprehension through many conservationists who considered that industrial and developmental interests had previously gained relative freedom from environmental controls under those very administrations. Then the new president set about stopping and in some cases reversing the growth of environmental legislation and controls that had burgeoned from the Sixties through to the Carter administration. This action was not surprising from a man who has been quoted in reference to forest conservation "when you've seen a redwood, you've seen them all."

An early expression of his philosophy was Reagan's enthusiastic backing for the Sagebrush Rebellion by sending Dean Rhodes, the father of the movement, a telegram pledging his Administration's support. Demands were being made to transfer the federal ownership of public lands to the states legislatures, many of whom wished to sell the land off to private ownership. Already several 'Sagebrushers' had gained key committee chairmanships in the

Senate and shortly afterwards James G. Watt was appointed Secretary of the Interior. This appointment sparked off a bitter and vigorous campaign against him and his policies.

Watt had been head of the Mountain States Legal Foundation whose main purpose was to oppose in the courts any government ruling or regulation which might delay the exploitation of natural resources. He represented coal and oil interests, mining companies and utilities. Now he was in charge of agencies under the Department of the Interior including the Bureaus of Mines, Indian Affairs, Land Management, Reclamation together with the Geological Survey, National Parks Service, Office of Surface Mining, the Office of Water Research and the U.S. Fish and Wildlife Service. He startled Congress with his fundamentalist Christian attitudes, quoting that man should multiply and subdue the earth and that he felt the responsibility of territorial management until the return of Jesus who would be more interested in people than in trees. Then began the de-regulation and the suggested sell-offs.

In the Office of Surface Mining the growing pressures for strip mining were aided by the reduction of the number of federal inspectors from 110 to 69 and in the appointment of a new director considered amenable to companies' demands. The U.S. Forest Service is now under the direction of John B. Crowe a former logging company attorney and the emphasis has shifted from multiple use and sustained yield to timber production as the major objective. Other set backs for conservationist interests followed, including radical changes in the Environmental Protection Agency (EPA). In 1981 Reagan announced dismissal notices for 49 members of the Council on Environmental Quality and later appointed Anne Gorsuch to replace dozens of E.P.A.

scientists and lawyers who had been implementing environmental quality legislation. She responded with fifteen new appointments, eleven of whom were former lawyers or lobbyists of the industries E.P.A. regulates. Examples are the former Washington lobbyist of Johns-Mansville Corporation, the nation's leading manufacturer of asbestos, a former attorney from the firm who represented Dow Chemicals in its suit to prevent its pesticides from being banned and a former lawyer from the oil giant Exxon. Gorsuch wishes to replace the collapsed implementation programme by 'voluntary participation'.

As a result water quality standards are now held to be in danger from sewage, industrial pollution and agricultural practices. An example of this is the recent E.P.A. decision to permit the application of the sterility inducing pesticide DBCP (dibromochloropropane) in South Carolina by aerial spraying, this despite its ban in California in 1977 and nationwide in 1979. The pesticide will be allowed on two-thirds of the State's peach crop because of the "severe economic emergency", and that in the face of the feared carcinogenic properties of the chemical. This decision, according to the *San Francisco Sunday Examiner and Chronicle* (12.9.82), was prompted largely by a study funded by the chemical's manufacturer Amvac who will gain \$1.8 million from this order.

Budgets of all agencies were cut by at least 12 per cent in 1982 putting many environmental control agencies in danger. The Federal Office of Coastal Zone Management has an uncertain future and funding has been withdrawn from states, hence generating financial problems for effective regulatory agencies like the California Coastal Commission.

Finally, in 1982 the President appointed a Property Review Board whose function was to establish annually for each agency, property holdings identified as 'excess' and this move is seen as a precursor of a massive sell-off of public lands. The Reagan 1982 budget anticipated \$1 billion from the sale of such lands and there are proposals to sell off \$4

billion of Forest Service and Bureau of Land Management lands. However those proposals and other politically sensitive matters, such as coal mining in national parks and development in wilderness areas, awaited decisions after the election. The increase in the strength of the so-called 'Green Lobby' in the new House of Representatives may delay or alter them.

President Reagan however, has not been so successful in enacting legislation to change environmental laws. According to a recent *Fortune* magazine, business lobbyists have conceded that environmentalists have been very effective in promoting their cause at Washington. That view is underlined by a telegram sent to members of the Business Roundtable on May 7th by the Chairman of U.S. Steel, Dave Roderick, when a move to reduce the standards ('reform') of the Clean Air Act failed. "Despite past efforts we have failed. . . to offset the work of the environment task force" and he went on to say that unless they pressed their views more effectively than the highly publicised environmental lobby's victory could frustrate regulatory reforms for the rest of the present administration.

At first the growth of that lobby went unnoticed and was held to be simply a reaction to Watt's appointment; certainly it played a large part in shaping his negative image and in generating an unfavourable reaction to his policies in Congress. In fact fourteen major groups, backed by scores of lesser organisations go to make up the environmental protection grouping, nicknamed the 'Green Lobby'. Now they are a force to be reckoned with in Washington with their professional staff numbering hundreds. Fired by their ideals they have become experts in fund-raising by direct mail, generating grass-roots pressure and building up membership to more than five million. During the Seventies membership growth was slow but there was a spectacular rise after Reagan's election and most groups are substantially larger than a decade ago. The Audubon Society has doubled in size over this period and the Sierra Club which took 90 years to grow to 200,000 by 1981, one year later totalled 311,000

members and many of these were better educated, more affluent, and thus probably more influential, than the average American. A recent survey of Sierra Club members found that they had a mean income of \$38,000 and that nearly 40 per cent were graduates.

The willingness of separate groups to co-operate has greatly strengthened the power of the Green Lobby. Some were slow to respond to joint effort and Brock Evans of Audubon recalls that it was hard to get the Society actively involved in major fights in the Seventies. However in 1981, stung by Watt, they sent out a letter announcing they were entering battle with the Federal Government to prevent "irrevocable destruction of much of America's natural heritage". This letter bought in ten times the earlier fund-raising appeals, the total nearly reaching \$1 million. The lesson was learned and taken one step further when environmentalists made extensive use of non-environmental groups in recent struggles. The campaign to save millions of acres of Alaskan wilderness in the late Seventies attracted fifty such groups into the Alaskan Coalition and built a network of thousands of volunteers. Similarly the Clean Air Coalition includes the American Lung Association, The League of Women Voters, The United Steelworkers of America and the National Urban League. Also the conservative National Taxpayers Union and several church groups have joined with the Green Lobby to try to defeat the Clinch River breeder reactor.

The Lobby has been successful in increasing and maintaining support for environmental protection in the U.S. public generally. In September 1981 the Roper Organisation Poll found 69 per cent of all Americans thought environmental protection laws were about right or had not gone far enough.

The environmentalists have enormously increased their influence on Capitol Hill, Washington. From a couple of registered lobbyists in the Sixties the number has grown to over eighty. Four of the top five organisations employ fifty lawyers, many from Yale and Harvard, to give the cutting edge in influencing

legislation conflicts. The large organisations use computer systems effectively to co-ordinate campaigning and Audubon has a staff of seventy working a computer bank and word processors to organise more than 50,000 activists. Thus despite Reagan's wishes, both the House and the Senate recently extended the Endangered Species Act (remember the snail darter fish and the Tennessee Tellico Dam hold-up of the Seventies). This action was after the Green Lobby had organised a committee of thousands of scientists to educate Congress about protecting species. Watt failed in his efforts to permit oil and gas leasing in some wilderness areas when with environmentalist backing, the House passed a bill in August 1982 by a six to one margin prohibiting such activities and some mineral leasing in the wilderness areas for ever. The Green Lobby put on "such an intensive effort in terms of personal contact and mail" said an oil industry lobbyist "that every time we were on the Hill we would find their tracks". The National Clean Air Coalition has been effective in countering the hopes of Reagan and many business executives that Congress would make major changes in the Clean Air Act.

During the campaign for the November election many candidates across America were sponsored by environmental groups. SCOPE (Sierra Club Committee on Political Education) spearheaded the movement and the October issue of *Sierra* listed 100 candidates considered sound on environmental issues including some Republicans who have resisted the Reagan view. Further instructions were given on how to make the volunteers' campaign work effective in supporting those candidates. Many were subsequently elected, such as the San Franciscan Democrat, Philip Burton, who was sponsored by the Sierra Club with \$5,000 direct donations and fund support dinners at \$500 a plate. He is now likely to be an environmental lobby leader in Congress. Opposition to Reagan has been stiffened in the House of Representatives by the election of 26 more Democrats bringing their total to 267 against 166 Republicans. In a survey organised by the

New York Times and C.B.S. News 50 per cent of the new crop of lawmakers, amongst other issues, showed their tendency to support the enactment of further conservationist and protectionist legislation.

The environmentalists now seem assured of further victories in their continuing campaign. With support reduced on Capitol Hill and a changing mood nationwide Reagan may feel obliged to modify his deregulation and privatisation stance. In fact with the run up to the presidential election of 1984 looming, adjustments may have to be made to the growing success of the Green Lobby, including possibly the jet-tisoning of Watt as a political liability. The U.S. environmentalists face the coming struggles with the Reagan Administration with confidence bolstered by their new-found strength.

D.D. Cook



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Obituaries

Manfred Siebker

It is with great sadness that we have learnt of the death of Manfred Siebker, one of the most brilliant and clear minded ecologists in Europe. Since helping to found Ecoropa in 1976 (of which he became vice president) he had been one of its most ardent participants. A nuclear physicist he was for several years an adviser to the European Commission in Brussels until, realising with horror to what he was contributing, he broke away to put his knowledge at the disposal of opponents to nuclear power. As a 'dissident' he offered his services to Aurelio Peccei with whom he collaborated although not without making his criticisms known on the direction taken by the Club of Rome during the last few years.

He combined a generous spirit and a deep Christian faith with courage and determination which made him a formidable opponent, especially to those belonging to the nuclear-military-industrial-system.

He was the principal instigator and editor of the documents published by Ecoropa on the occasion of the last European elections, notably with his manifesto for a different Europe, Towards an Ecological Democracy. The manifesto will still be relevant for the elections of 1984.

His death has been a great loss for the European ecological movement and he will be sadly missed. Nevertheless his teaching and his memory will give strength to those who are pursuing the fight to which Manfred Siebker gave the last ten years of his short life.

Edouard Kressmann

Mira Behn 1892-1982

With the death recently of Mira Behn, *The Ecologist* has lost a great friend and supporter, who was a living link with Mahatma Gandhi. Born Madeleine Slade, ninety years ago, the daughter of an Admiral, she spent some time in India as a girl, in typically Viceregal surroundings, aware neither of the political unrest of the sub-continent, nor of the condition and aspirations of the Indian people. The recognition that she had some mission in life and the spiritual search that was eventually to bring her back to India, began in 1923 when she met the distinguished French writer, Romain Rolland, and read his just completed short book about Gandhi — this transformed Madeleine Slade's life.

With extraordinary perseverance and insight the young English woman who had been brought up in a typically conventional way, set herself a course of spiritual preparation before setting out to join one of Gandhi's ashrams: A first she was accepted only as a guest, but very soon she chose, not without misgivings on her behalf, by Gandhi himself, to make a total commitment to the life of poverty, simplicity and hardship that was required of his followers. She adopted the vegetarian diet and Indian dress which she adhered to until the end of her life. From this time on, until his assassination in 1948, Mira Behn (the name he gave her) was among Gandhi's most trusted friends and disciples. In all his struggles and labours, through the setting up of the village ashrams and the early days of constant travel bringing his teaching to the people; at meetings with successive Viceroys; in the Civil Disobedience Movement, she was at his side sharing the poverty and the disease of India's poorest people (when she was stricken with typhoid Gandhi appointed himself her sole nurse and took care of her day and night); and in 1931 she accompanied him to England for the Round Table Conference in London.

Only when ordered by him to go out and do other work did she unwillingly leave him. These were usually periods of loneliness and unhappiness, but her great love for animals, be they dogs, donkeys, cows or elephants, and her delight in the Indian landscape, sustained her during these exiles and kept her faithful to her chosen life and her delight in the Indian landscape sustained her during these exiles and kept her faithful to her chosen life to whatever Gandhi asked of her. After his death she was very much involved with the welfare of the smallholdings movement, and her advice was sought on all sorts of matters in this field. She went to Kashmir to advise on the setting up of a cattle development project in which she had a free hand to select the site for the centre and the breeds of cattle. She went in person to meet the precious Dexter bull and heifers imported from England, and travelled with them across the hundreds of miles back to the cattle centre, to make sure that they were well cared for on their arduous journey.

Ten years after Gandhi's death Mira Behn left India and went to live in Austria where she wrote her autobiography and worked on a book about the spiritual significance of Beethoven's music. In the late 1970s she came to England and lived, because she was very poor, caged most unsuitably in a tiny apartment in Tunbridge Wells, where, because she was unable to walk very far, she was entirely dependent upon the care of her devoted Indian boy, Dutt, who had left his wife and sons in India to follow and care for her. When I visited them two years ago Mira had been housebound for five months in a wretchedly small room with a window so high that she could not see even the tops of the trees in the garden outside. It was as we were driving through the sun-dappled orchards, and between expressions of delight in the sight of a bird or, even more, of cows happily grazing, that she told me that she was at work on notes for Sir Richard Attenborough, who had been in correspondence with her about his projected film about Gandhi. But neither the climate nor the suburban life of Tunbridge Wells suited her, and at the beginning of 1981 she and Dutt moved back to her beloved Austria. I fear she will not have seen Sir Richard's completed film, but much more importantly I know that she lived at peace for the last months of her life, with a view of the mountains that reminded her of Kashmir.

Ruth Lumley-Smith



Books

A Model of Ineptitude

GROPING IN THE DARK, THE FIRST DECADE OF GLOBAL MODELLING, D. Meadows, J. Richardson, G. Bruckmann, (Eds.) Wiley, 1982.

"Human beings learn by trial and error

error
error."

It's very hard to learn if you never allow yourself to make an error." (p.286)

Is it possible to take seriously a book concerning an international conference of experts on global modelling which includes the above quotes? The answer in this case is clearly no. The editors have done a great disservice to the participants at the conference and insult the intelligence of any potential reader.

The editors of this very irritating book refer in a very self-conscious and pretentious manner to the need to consider biases. "IT IS BETTER TO STATE YOUR BIASES THAN TO PRETEND YOU DON'T HAVE ANY". (They are fond of a rather childish use of capitals.) I agree, indeed I have made the same point in an article in *The Ecologist* (Vol. 10, No. 5): "In judging the value of any future picture it is then of prime importance to consider who is representing the scenario, for whom (this is the key factor) and with what aim in mind." But they Meadows *et al* fail to understand their real biases (Meadows, for example, who is "white, female, American and academic", "believes that all people are truly magnificent . . ." and, more importantly, do not consider the biases of the modelling groups (this is not, after all, a book about Meadows, Richardson and Bruckmann).

Indeed, the editors are so far from any understanding or recognition of biases or basic world views that they discuss modelling paradigms in terms of techniques: systems dynamics, input-output, etc. A paradigm in-

volves a total attitude, not a choice of a particular methodology.

A rather vacuous list of "areas of agreement" is given, twice (p.xviii and p. 15). Firstly, anyone familiar with the models and the modellers will know instantly that this list is *not* representative of most modellers' positions. Meadows and Richardson are leading lights in the Hunger Project founded in the USA. Allegiance to this project colours their statements about the problems of feeding everyone adequately. This conference has been used as a propaganda format, *without* the recognition of the true biases of the editors. The list is a sham.

Secondly, at a recent meeting I made the point that the degree of consensus amongst modellers is due to similarity of background, and that anyone with radical new ideas will not get any funding. Sam Cole agreed that "the consensus amongst modellers is a sociological phenomenon. IIASA in particular" (the book is about an IIASA conference) "has been responsible for seeking the consensus, by imposing a consensus on the modellers, by weeding out, by funding or through ideological differences, those who do not fit into the model which IIASA and the major institutions who support these models would like to see." The book concerns a very ingrown small community, and unfortunately it has been prepared by members of that community. As one outsider at the conference, sociologist P. Nenrath, commented: "I am, to some extent, astonished that so many of you skirt the essentially social, economic and political nature of your work, of your results, and of the impact that it has on the social and political world around you. True, each of you is fully aware of this. Nevertheless, I find it amazing that so eminently political an activity can be discussed in such generally unpolitical terms."

Indeed some of these modellers had sent a message to the heads of state at the Cancun meeting, offering their computer models to solve the world's problems; a naive action which demonstrates an incredible lack of humility, sense of perspective or understanding of the true nature of the Cancun side-shows.

I believe that one of the "areas of agreement" is meant to support the type of 'cooperation' of multinationals implicit in the work of the Club of Rome and the modelling of Mesarovic and Pestel. Thus we are told: "Cooperative approaches to achieving individual or rational goals often turn out to be more beneficial in the long run to all parties than competitive approaches." But it could also be a call for a world-wide communist revolution, or a plea for collective self-reliance in the South. The

statement is as meaningless as many of the other conclusions, supposedly drawn from a decade of very expensive global modelling, by much analysis and reflection on the part of highly intelligent people. These include: "2. Population and physical (material) capital cannot grow forever on a finite planet." But how does this fit in with "area of agreement number 1" noted below? Does not global modelling involve a degree of quantification? The degree of vacuity is truly breathtaking.

"1. There is no known physical or technical reason why basic needs cannot be supplied for all the world's people into the foreseeable future. These needs are not being met now because of social and political structures, values, norms and world views, not because of absolute physical scarcities." That 'absolute' has me a little bewildered. Is it no longer to be considered a physical scarcity if (for example) Africans cannot provide food for themselves (a drought is a pretty physical reality) and are starving, merely because there is a surplus of grain in the USA?

The same bias is found in the reporting, without comment, of the 'finding' of Leontief that "no insurmountable physical barriers exist within the twentieth century to the accelerated development of the developing regions", and that "magazine articles still appear occasionally" which report that the model (i.e. the Leontief model) 'discredited' *The Limits to Growth*. In a book about modelling the reader deserves to be told if that claim is correct. In fact it is not, the crises of *The Limits to Growth* appear in the twenty-first century, Leontief (and the editors too) knew this, and that particular claim in my opinion represents the most outrageous misuse of a complicated computer model as a black-box propaganda tool that I am aware of.

It would be more courteous to the reader to present not a purported list of "areas of agreement" amongst some modellers, but an analysis of areas of agreement amongst *models*, including some analysis of why the agreement has been reached. In my view the only one area of agreement is that there will probably be widespread starvation in parts of Asia, probably within this century, certainly early next century. This is not mentioned.

Similarly it is interesting to consider why the Japanese FUJI model might recommend that ". . . we should abandon the age in which each country pursued its economic growth in its own arbitrary and self-seeking way and should be ready to meet the new age characterized by the need for international cooperation from a global viewpoint. . . ." It used to be called the Greater Co-Prosperity Sphere. We deserve to be told just

what all these fine-sounding phrases really mean. In particular, no use of the word 'cooperation' should be allowed to slip by without some clarification.

Now to that rather sexy title. This review may seem a trifle biting, but I did at least force myself to remove a few choice comments on the idea of groping in the dark (including an admission of my own personal biases in that direction). It is apparently claimed that the solution to the world's problems are to be found where no-one is looking, in the dark, while the search is too much focussed on well-lit areas. What relevance has this to global modelling? Of all methods of analysis, modelling is the one most confined to the areas in which light is already thrown, being so dependent on input data and on a theoretical base, as well as on the biases of wealthy status-quo sponsors. If the fable has any relevance, it would be to move attention more to political and socio-cultural factors which are not appropriate to computer modelling. The title is foolish and irrelevant.

The format of presentation is likewise trendy and irritating; the use of pretty pastel pages is as silly and insulting to the reader as is much of the text.

One comment of interest to readers of *The Ecologist* is that of one speaker who "identified the deep split between economic models, whose rational is primarily exploitation of natural resources and, ipso facto, of the biosphere, and, on the other hand, ecological models whose principles are those of maintaining variety and dynamic equilibrium. The conclusion of this line of thought is that economic models must either be abandoned or at least drastically modified before a satisfactory treatment of the environment is possible."

In my opinion the concern with the environment must, like socio-cultural concerns, be introduced into the total planning context, of which models are only a part — just one tool amongst many. Fortunately this particular conference does not represent the totality of continuing modelling efforts. In many circles both the limitations and the benefits of modelling are well appreciated. Thus, for example, in planning for a Unesco programme of reflection on world problems and future-oriented studies, it is noted that "in many cases, the main methodological tool is the model. The advantage of models is to provide a consistent framework for the variables whose development and interaction it seeks to define." "It is nevertheless important that they should give due prominence to the social and cultural factors which affect the development of societies, particularly to those relating to educa-

tion, scientific and technical progress, and information and communication systems. One needs also to be fully aware of the limitations inherent in the use of models. Other methods, quantified or not, should also be employed so that the reality of world problems can be examined more thoroughly. There is a particular need to devise intellectual approaches, and even methodological tools, that will enable social and cultural factors and their interaction with other factors, especially economic and technological ones, to be taken into account." Global modelling is now sufficiently well established that it can be opened to a wider criticism and not left to the self-indulgent whims of an ingrown group of practitioners.

John Robinson

The World we have Lost

THE GIFT OF GOOD LAND: further essays cultural and agricultural, by Wendell Berry, North Point Press, \$8.50.

These essays could well have been sub-titled 'The World We Have Lost', for their catalogue of estrangement, moral and physical, is a chilling portrait of man severed from his roots. But despite this harshness they also encompass the possibility of resurgence and Wendell Berry is no tedious prophet of doom. He believes in man's ability to change and that people can choose their destinies.

Occasionally, however, it seems his own facts must defeat him, as in the essay 'Three Ways of Farming in the South West', written in 1979.

On the U.S. border with Mexico, the remnants of the Papago peoples subsist in their reservation in the Sonora desert. From being an historic community of agriculturalists sustained by the art of survival in the harshest of environments, they have been reduced to consumer status by an intrusion of government aid and modern techniques.

Berry quotes author Charles Bowden, who wrote in *Killing the Hidden Waters*: "The Papago were at once austere and generous, giving and sharing were necessarily their first principles. The people needed each other too much to risk individualism and dissent. The man who hoarded, who saved, who said he and his blood would make it on their own . . . such a man led his kin to extinction. In the Sonoran desert, power came from toil and could only be stored in other human beings."

That morality, forged by necessity, was to be destroyed.

"Education divided the tribe between those who had seen the tractor and those who had not. Half a century later the Papago are no longer self-supporting. They now have a groundwater problem, an over-grazing problem and an economic problem. The society of abundance is gone."

That encapsulates the paradox of progress, which these essays amplify, until you wonder how with such evidence of folly we can still believe that bigger is better. The greed of vested interest and the incompetence of education seem allied in a juggernaut that is, at best, mindlessly destructive and, at worst, malevolently contrived to destroy human morality and life on the planet.

For Berry this is seen clearly in the destruction of agriculture by 'agribusiness'. "Farming, according to most of the powerful people now concerned with it, is no longer a way of life, no longer husbandry or even agriculture; it is an industry known as 'agribusiness', which looks upon a farm as a factory and upon farmers, plants, animals and the land itself as interchangeable parts, or units of production."

"This view of farming has been dominant now for a generation and so it is not too soon to ask: How well does it work? We must answer that it works as any industrial machine works: very 'efficiently' according to the terms of a specialised accounting. So long as we keep the focus narrowed to the food factory itself, we have to be impressed. Only when we widen our view do we see that this factory is a failure. Within itself it has the order of a machine but like other enterprises of the industrial vision, it is part of a rapidly widening and deepening disorder."

Travelling to Arizona, Berry describes in detail fields ruined by salination, a by-product of pumping dry the aquifers beneath the desert for irrigation. Fields ". . . are now abandoned and produce only a very sparse growth. Nevertheless they are fenced and sheep turned in to exploit their small remaining value as pasture. They are over-grazed, further exposing the ground to the winds and allowing the dust to blow. As the dust blows away the heavier particles of sand and gravel stay in place. The rain beats these into a tight seal over the surface of the ground. This is the final product of agriculture here. It is called desert pavement and it is aptly named. It is as sterile as a concrete road and feels the same underfoot."

"Such fields have two possibilities: they either lie waste, at the mercy of geological time, or they become the sites of housing developments . . . The process that destroys the productivity of the land thus increases the number of mouths that must be fed."

"One would like to say that these

fields are somehow unusual, or different from the rest of American agriculture. But this is American agriculture, which is now fairly uniform in technology, economics and attitude from coast to coast. This land just happens to be marginal because of its low rainfall — and it is at the margins that the weakness of an enterprise will show first and most dramatically.”

But as well as these damning descriptions, there is an impassioned plea for the small farmer, the subsistence farm and the grace, skill and diversity of such enterprises.

“The practicality of the small farm may lie in the inherent human tendency to cherish what one has little of. The small farm is a human organism and has its origins in both nature and culture. Its justification is not only agricultural but is a part of an ancient pattern of values, ideas, aspirations, attitudes, faiths, knowledges and skills that propose and support the sound establishment of a people on the land.

“I am more and more convinced” Berry writes “that the only guarantee of quality in practice lies in the subsistence principle — that is, in the use of the product by the producer — a principle depreciated virtually out of existence by industrial agriculture.”

Reinforcing this logic he recalls his childhood: “One’s elders in those days were always admonishing one to save nickels and dimes and there was tangible purpose in their advice: with enough nickels and dimes one could buy a cow or a sow; with the income from a cow or sow, one could begin to save to buy a farm. This scheme was plausible enough, evidently, for it seemed that all grown-ups had meditated upon it. Now, according to the savants of agriculture — and most grown-ups believe them — one does not start in farming with a sow or a cow; one must start with a quarter-of-a-million dollars.”

But there is no slide into sentimentality. Berry is not an advocate of the past for its own sake. If he proposes the purchase of a team of horses, as against that of a tractor, he insists the decision be made on practical considerations. His call is for reappraisal of our human situation and from that a willingness to commit one’s own beliefs against the generalisations of the day. This necessity for positive action is beautifully set out in the essay ‘The Reactor and the Garden’ and if, for anyone, his preoccupations should seem myopically agricultural, they find their justification here, too. This is a fine book. It would be hard to fault its sincerity and the commitment of the author to the way of life he proselytises. If it has a fault, then it is one inherent in the human condition and that is that not everyone sees, or accepts, the necessity of corresponding

actions. We are all, to greater or lesser degrees, compromised. Even the Amish farmers, already committed to their horse teams, run lines in the winter months to collect pregnant mare’s urine for hormone extraction by drug companies. In this way they pay their interest charges but also help to perpetuate the drug addiction of agribusiness. This conflict between what is corresponding and what is expedient is typified in an interview Berry conducts with a lone land reclaimer, forced by the magnitude of his projects to employ the tools the land exploiters used.

“Wally has necessarily reconciled himself to the bulldozer. But he remains in a kind of conflict with it too. It is a powerful generaliser and tends, just by its power and size, to work against his own governing impulse to take care of things, pay attention to details. It is too easy to be lazy when you are on the dozer. ‘It’ll move anything. It’s hard to save a log, or a tree. I have to keep telling myself: Get off this thing.’”

The accumulation of facts is bleak and despite individual triumphs, the tide hard to turn. After all it is the strength of commerce that its rewards are so enticing and the cost so apparently little. In commenting on a memoir of childhood on a New England farm, Berry writes: “One cannot read this book — or I, anyhow, cannot — without asking how that sort of life escaped us, how it was depreciated as a possibility, so that we were able to give it up, in order, as we thought, to improve ourselves.”

But to return to the principles of thrift and subsistence (words already reduced to pejorative status) will take a moral revolution.

Mike Hume

When Big is Beautiful

ELEPHANTS by S.K. Eltringham, Blandford, £10.95.

RUN RHINO RUN by Esmond and Chryssee Bradley Martin, Chatto and Windus, £9.95.

SEA GUIDE TO WHALES OF THE WORLD by Lyall Watson, Hutchinson, £12.95.

Which would you rather go to see — a perfectly ordinary elephant, or, say, a woodlouse of a previously unknown species? If, as I suspect, most of us would opt for the elephant, it is an indication of the fascination we feel for big animals. In this context, big is beautiful, or at any rate interesting. So these three books on elephants, rhinoceroses and whales, have immediate appeal. Of course,

big animals tend to be interesting for other reasons besides their bigness: for example, there is a fairly high correlation between size and intelligence, and hence complexity of behaviour. There’s more to an elephant than a woodlouse. How much more, Keith Eltringham’s book does a lot to show. He is uniquely qualified, as a professional biologist with many years’ practical experience of wild life in Uganda; and *Elephants* is both scholarly and readable. It is a distillation of the enormous amount of work done on elephants in the last ten or fifteen years.

In a particularly absorbing chapter on the social life of elephants, Dr Eltringham stresses the importance of *tradition*, the learned rather than instinctive behaviour of the matriarch-led family groups which are the basic units of elephant society. This has a bearing on the problems of conservation which has only recently come to be recognized; and *mutatis mutandis* it doubtless applies to many other advanced species besides elephants. “The widespread illegal killing of elephants which was taken place recently in East Africa is particularly disturbing for this reason. That the numbers should be so reduced is bad enough but far worse is the fact that the survivors, which tend to be young because they have the smallest tusks and are, therefore, less attractive to poachers, are left as leaderless mobs with no one to look after them when times are difficult.” Times, needless to say, are unusually difficult at present. Their slow reproductive rate and long life inevitably makes elephant populations incapable of rapid adjustment to changes in their environment. Hence the “elephant problem” which bedevils so many African national parks and reserves. Basically this problem is one of over-population — elephants “know the position of a park boundary to the metre” and, sensibly enough, seek its protection from all the surrounding areas. But large numbers of elephants in a park tend to wreck the habitat, uprooting grass and smashing trees. Eltringham reluctantly concedes that in some cases culling may be the only remedy; unnatural problems demand unnatural cures.

Overpopulation is not a problem for most species of rhinoceros. Between 1970 and 1980 the world rhino population was roughly halved; the African black rhinoceros, formerly the most numerous species, was by far the hardest hit. As everyone knows, this was the work of poachers meeting the commercial demand for rhino horn in Asia. Everyone also “knows” that this demand is based on a belief in the aphrodisiac properties of the horn: but in this respect everyone, as *Run Rhino Run* reveals, is wrong. Esmond Bradley Martin was sponsored by the World Wildlife Fund

in 1979 to investigate the trade, and his findings provide the main theme of this book. The Far Eastern peoples, it seems, value the horn mainly as a cure for headaches, colds, fevers and arthritis — an aspirin-substitute rather than a love-potion. But the major importer is now North Yemen, where rhinoceros horn is carved into dagger handles. These were always status-symbols there, but only recently has a greatly increased per capita income put them in reach of almost everyone. Dr Martin has suggestions for curbing the trade, and also for conservation measures in the rhinos' homelands. Adequate protection in reserves seems to have ensured the survival of the white and Indian species; similar measures are urgently needed for the black rhino, and still more for the desperately rare Javan and Sumatran rhinos. Establishment of breeding populations in the total safety of reserves in Western countries (the "Arabian oryx" solution) may be the only hope.

For whales, it seems, hope has dawned at last: the killing is stopping at the eleventh hour. Lyall Watson's timely *Sea Guide to Whales of the World* reveals the wonder and the beauty of these spectacular mammals. An introductory essay discusses whales in general, their evolution, biology and behaviour. In the main section, each of the 76 living species of cetacean is described in detail, with splendid coloured illustrations by Tom Ritchie, distribution maps, and diagrams of distinctive behaviour patterns as an aid to identification. Dr Watson's book is much more than just a whale-spotters' guide: even those of us whose sole experience of cetaceans in the flesh is an occasional visit to the nearest dolphinarium will find it a delectable bedside book. One learns something interesting from every page. Killer whales will eat any available warm-blooded prey except, for some unknown reason, man; the sperm whale can hold its breath for nearly an hour and dive to perhaps 10,000 feet; humpback whales repeatedly sing the same organised sequence of sounds lasting for ten to fifteen minutes, and all the humpbacks in one area sing a local song different from those of other populations; in the Yangtze river there are blind white dolphins who hunt fish by sonar and are locally regarded as reincarnations of a drowned princess. I could go on and on . . . All cetophiles will want to own this book; and when they bequeath it to their children it will very likely still be the standard work in its field.

Nicholas Gould.

Anatomy of an Ostrich

THE CHANGING ANATOMY OF BRITAIN. Anthony Sampson. Hodder & Stoughton. London 1982. £9.95.

This work, the author is good enough to warn us, "Is not a book about how Britain *should* be . . . but how it is . . ." and perhaps this is why it tends to read like a Sunday supplement that goes on and on.

Anthony Sampson must be one of the ablest journalists alive, which is why this book, like its predecessor '*The Anatomy of Britain*', will doubtless receive much favourable commendation, will be widely read and frequently quoted.

But it remains journalism, an exercise of which, in Britain's unparalleled crisis situation we would appear already to suffer a surfeit. Fortunately for the reader the author cannot, despite his intentions, fail to reveal his own value judgements on the contemporary scene, and it is this element which contributes as much as anything to the book's interest. For it becomes clear as we go along that what is wrong with Britain is what is wrong with millions of its people, including Mr Sampson.

We are taken on a package tour of what he feels are the main national problem areas and how our institutions are trying to grapple with them, whether in politics and government or in finance and industry, and never once, like so many other people at the top, does it appear to cross his mind that he is writing in a cul-de-sac and that the pace of twentieth century events has outdistanced the parameters of his customary assumptions and made inconsequential much that he has to say.

If we live in a state of chronic and mortal crisis it is surely reasonable to suppose that at least some of the basic assumptions which govern our actions, actions which are part and parcel of the crisis, and which we assume to be decent, reasonable and constructive, are wrong. And not simply wrong, but mad and suicidal, and which will surely appear so to such of our posterity which is able to survive the consequences of the wicked folly of what we are doing.

Hence it should occasion no surprise that what purports to be an 'anatomy' of our ills should find no room for a discussion on pollution, let us say, or any other of the multifarious elements of the ecological crisis, or of the looming problems of resource depletion or the population tidal wave advancing upon us, or that war and the bomb peril should be

viewed merely as factors in our situation on a par with, again let us say, Britain's rate of industrial growth. No awareness at all that here are the real parameters of Britain's problem areas and that to discuss public affairs without reference to them is like discussing failures of navigation without reference to geography.

On one problem the author has some useful observations to make. He sees accurately enough that the moves towards centralisation and gigantism, especially in their accelerated form under successive governments, (and despite all the political hoo ha it doesn't really matter which) of the 60s and 70s were blunders of the first order. Good! But then what is his solution? He thinks we should support the new old-hat party's (the S.D.P.'s) policies for decentralisation *and*, (the need to italicise the conjunction is imperative), to further integrate Europe!

One might suppose that if a need is felt to develop an ocean-liner size economy we should take care to have available sufficient tug boats to ensure it can be safely berthed. To fail to do this may be said to be asking for trouble; but to proceed to develop an ever more gigantic ocean-liner economy which dwarfs all previous experience in such matters and to continue to ignore the need for any tug boats at all is surely to sit on ones hind legs and beg for it.

And of course, with a continuing uncontrollable rate of money debasement, despite more than three million unemployed and a degree of governmental indebtedness, a form of financial cholera which is now sweeping the globe, which is threatening the entire monetary system with destruction, that is what we are getting.

Mr Sampson may well say that the decentralist policies he supports (as a loyal SDP member?) are an answer to this point. If he does he seems to express no more than the usual unawareness of the dynamics of the factors that have already led us into the quicksands of gigantism, dynamics which will ensure that any moves from the top for decentralisation will never be more than cosmetic and will certainly do nothing to check the momentum towards overgrowth, towards criminal forms of eco-vandalism, and the general social collapse towards which we are clearly heading.

John Papworth



Letters

Deforestation and Population

Dear Sir,

Plumwood & Routley (*The Ecologist* Jan-Feb 1982) hold that blaming population growth as the cause of deforestation is "based on a methodological fallacy . . . very often, expansion of subsistence agriculture is not the main factor, but rather the cause lies in various kinds of corporate agribusiness-based development, whether for forestry, agribusiness, or mining". They eloquently explain the backgrounds and workings of what can be called 'planned forest destruction' and indicate the new elites who collect profits from it.

Population pressure, however, differs enormously—from very low in Amazonia to very high in, for example, Sumatra and the Philippines, where shifting cultivation is a major factor in deforestation. The 1977 report to FAO by Chandrasekharan cites 11.5 million shifting cultivators for Indonesia alone. But in Plumwood & Routley's paper I have looked in vain for figures. They not only play down the population problem—with words only—but even discredit the Global 2000 Report, with its large amount of documentation. Deforestation, in their view, stems from westernized ideas of development: "the elitist and repressive social structure, the governments with their close connection with multinationals and the highly unequal access to existing agricultural land". They support their argument with striking examples of bribery and corruption, suppression and compulsory assimilation of groups, destruction of local economic systems (apologized for by FAO officials) and clearcutting for the woodchip industry.

While their argument is impressive, the question remains: why obscure this very real, in places disastrous, population growth? The answer lies in their sentence: "The current tragedy of rain forest destruction is certainly not caused by an excessive concern for distributional justice, but rather by its opposite". Their whole article is one moving plea for just such distributional justice—of land, money, and power. But a runaway population growth does not suit the argument: it would preclude the fulfilment of such a programme.

One can be sympathetic to Plumwood & Routley's viewpoint and the plight of the poor, whose problems deserve full attention. But from the viewpoint of forest survival, we can only conclude that Plumwood & Routley want to use the rain forests as much for their own chosen political purposes as do the ruling power elites whom they accuse and condemn. It is a matter, of course, of the good leftists against the bad rightists: one party pushes for a just redistribution of land and wealth, which another party wants to grab and hold. In the eyes of many, this is an honourable and necessary struggle. Nonetheless, the fact remains that as far as the rain forests are concerned, it does not make one bit of difference who cuts them down and for what reasons.

The land under a rain forest, leached by the high rainfall, is worthless nearly everywhere. The forest itself has the value. But no means for sustainable exploitation have yet been found. As a resource it is, for all practical purposes, unrenowable. All humans can do is to degrade it. Rain forests cannot, therefore, be classified among the customary 'means of production', like raw materials from renewable sources, agricultural land, machinery, or stocks of (un)finished goods. Unlike these, rain forests do not need the hand of man, on the contrary. Redistribution of rain forests can therefore only lead to their destruction, in ways other than those 'planned' now, but destruction all the same.

Those who care for the forests and their values should protect them from any force that aims to exploit them, for whatever political cause. In nearly all cases, planned destruction is far easier to stop than shifting cultivation. Planned

destruction often appears on second thought unnecessary, inefficient, and expensive. Conservationists should be able to explain this, and therefore keep the dialogue about the forests open with all parties. This is not easy to achieve by those who have morally condemned one party beforehand. If a moral judgement with regard to the rain forests is needed, it would be better reserved for acts towards the integrity of the forests themselves. Conservationists should never leave out or play down important factors, which is such a common error among exploiters. By protecting the rain forests, the long-term interests of all parties (plants, animals, and humans) is served best. The population problem will not go away by ignoring it.

Yours faithfully,
Dr. M. Jacobs,
Rijksherbarium,
Box 9514,
Leiden, The Netherlands.

Dear Sir,

While I am gratified that you considered the article *Deforestation, Erosion and Forest Management in Ancient Greece and Rome* worthy of reproduction from the *Journal of Forest History*, I am somewhat concerned by the impression given by the change of title to *Deforestation in Ancient Greece and Rome: A cause for Collapse*. I am not speaking for my co-author Professor J. Donald Hughes who may possibly have different views, but the change in title changed the context, the mind-set, in which the reader approached the paper. I personally do not subscribe to the view that the Graeco/Roman civilization fell because it maltreated its environment or that the Mediterranean landscape of the present day is the heritage left us by the ancients. If you have read my book *Man and the Mediterranean Forest: A history of resource depletion*, published last year by Academic Press, you will know that I believe that one has to look elsewhere and to another period for the agents of change in the Mediterranean environment. The Romans had a forest administration with patrolling forest guards, they had forest legislation, they certainly had demarcated state forests and there is evidence that they understood and practiced forest

management — they certainly practiced silviculture, protected forests and established plantations. Indeed there is evidence that in Italy itself there was more land under forests at the end of the Roman period than previously.

To suggest, as your modified title does, that deforestation was a cause of the collapse of the classical world is, in my view, a gross exaggeration and oversimplification of the complex circumstances that lead to the breakdown of the Roman Empire.

Your faithfully,
Prof. J.V. Thirgood,
The University of British Columbia,
Vancouver, B.C.
Canada.

Kibbutzim—Marxist or Not?

Dear Sir,

We are interested in the article published in *The Ecologist* (vol. 12, no. 3 1982) on the kibbutz by Nigel Pollard.

The essence of the article was a detailed description of Merchavia's social structure, kibbutz democracy and the family, in which the author maintained that the kibbutz had Marxist-Leninist leanings and that the kibbutz pays little importance to ecology.

In fact the kibbutz movement is associated with various theoretical and ideological concepts. Albeit in small numbers, religious kibbutzim are affiliated with Kibbutz Hadati, while a few kibbutzim of reform religious beliefs are part of the United Kibbutz movement. Nevertheless the factors which unite the kibbutz movements of all shades and trends (all organised under the one Alliance of Kibbutz Movements) is community of production and consumption, a co-operative, equal life style and the realization of Zionist aims comprising the in-gathering of exiles, the settlement and the security of the country, and the building of a co-operative workers' society. The majority of the kibbutzim belong to two national movements: 1. The United Kibbutz Movement (product of the union between Kibbutz Hameuchad and Ichud Hakvutzot v'Hakibbutzim) 2. Kibbutz Artzi of Hashomer Hatzair.

When the political radicalization of Kibbutz Hameuchad began in the 50's and the consolidated ideology was drafted (1955), there was not the slightest reference to a Marxist-Leninist connotation. Nor did Kibbutz Artzi include any Marxist-Leninist definition in its basic ideology, even though, as a faction, most of the Mapam political party leaned toward Marxism-Leninism as a political struggle for the realization of socialism. Since then, much of the political reality and theory in the workers' movement has changed and Mapam no longer describes itself as having Marxist-Leninist sympathies, but desires to be accepted into the Socialist International.

Marxism-Leninism negates Zionism in all its facets, not only from the standpoint of formal definition but also from that of political reality and theory. The exception was the short period when Gromyko, speaking in the name of the Soviet Union, came out in favour of founding the State of Israel. In general, however Marxism-Leninism dismissed the collective as an utopian phenomenon and an impediment to the class struggle of the workers' movement.

The kibbutz, its plans and the implementation, is a constructive socialist phenomenon of our time, in spite of the state of the regime and of the materialistic society. Philosophically, the kibbutz is influenced by the theories of the Prophets of Israel, by the Utopians, by Humanists, by Anarchists such as Kropotkin and Landauer and by the Marxist doctrine which rejects a society based on class and social exploitation and which envisages a social order based on the tenet "From each according to his ability and to each according to his need." In any case, today, it is sheer nonsense to link the kibbutz movement or any part of it, to Marxism-Leninism.

Regarding the kibbutz's attitude toward environmental ecology, it is true that there is a general lack of awareness of the importance of human and natural environment. But this is not inherent in the philosophy of the kibbutz. Indeed in connection with the natural environment, to which the writer alludes, the agro-technical methods of the kibbutz farm, even though directed toward extracting the maximum production and

human benefit from the natural resources, embody a deep concern for the protection of those resources, through intensive irrigation, prevention of land erosion, drainage, terracing of the hill-sides, efficient use of water and advanced methods of animal husbandry. Although the kibbutz does not embrace the theoretical approach of the 'vegetarians' and the 'naturalists' still there is an effort to use more 'natural' work methods (no use of sprays, etc), and certain kibbutzim try to achieve production by using such natural methods. But it must be borne in mind that the dictates of the market with its demands and competition, restrict the kibbutz.

In conclusion, if there is a type of farm or settlement in which the principles exist in which there is concern for natural and human ecology, with all its human failings, it is the kibbutz.

Zeev Tsur,
Director,
Archives Tabenkin Institute,
Efat, Israel.

Editor's note:

Although Kibbutzim are well placed in terms of community effort to put ecological principles into practice, in my experience of Israel (*Ecologist* Vol. 10 No8/9 1980) they have turned rather to aggressive agro-industrial techniques with the emphasis fair and square on maximising production. In that aspect they seem to have followed more the proletarian notions of production as embodied in Marxist doctrine rather than the communitarian ideals of Kropotkin and the anarchist movement. Hence in practice — and that was one of the points made by Pollard in his article — kibbutzim are far from practising a sustainable agriculture. In my opinion Israel desperately needs an ecological movement to prevent its land degrading further than it already is. The tragedy is that the kibbutz movement has failed so far to see the connection between the Zionist aspirations of a return to the 'Land' and a reverence for the land that is inherent in many traditional and organic methods.

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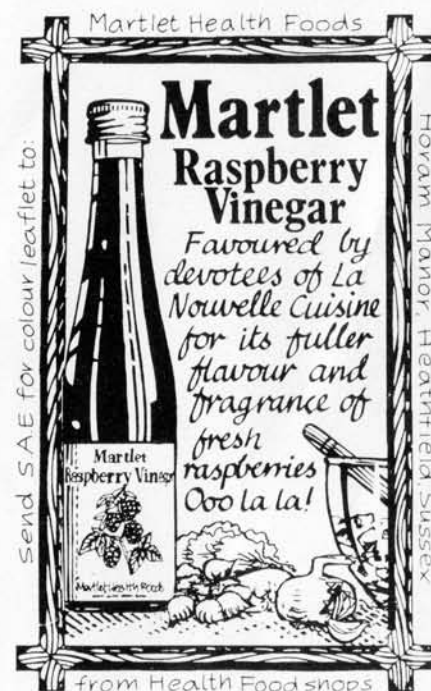
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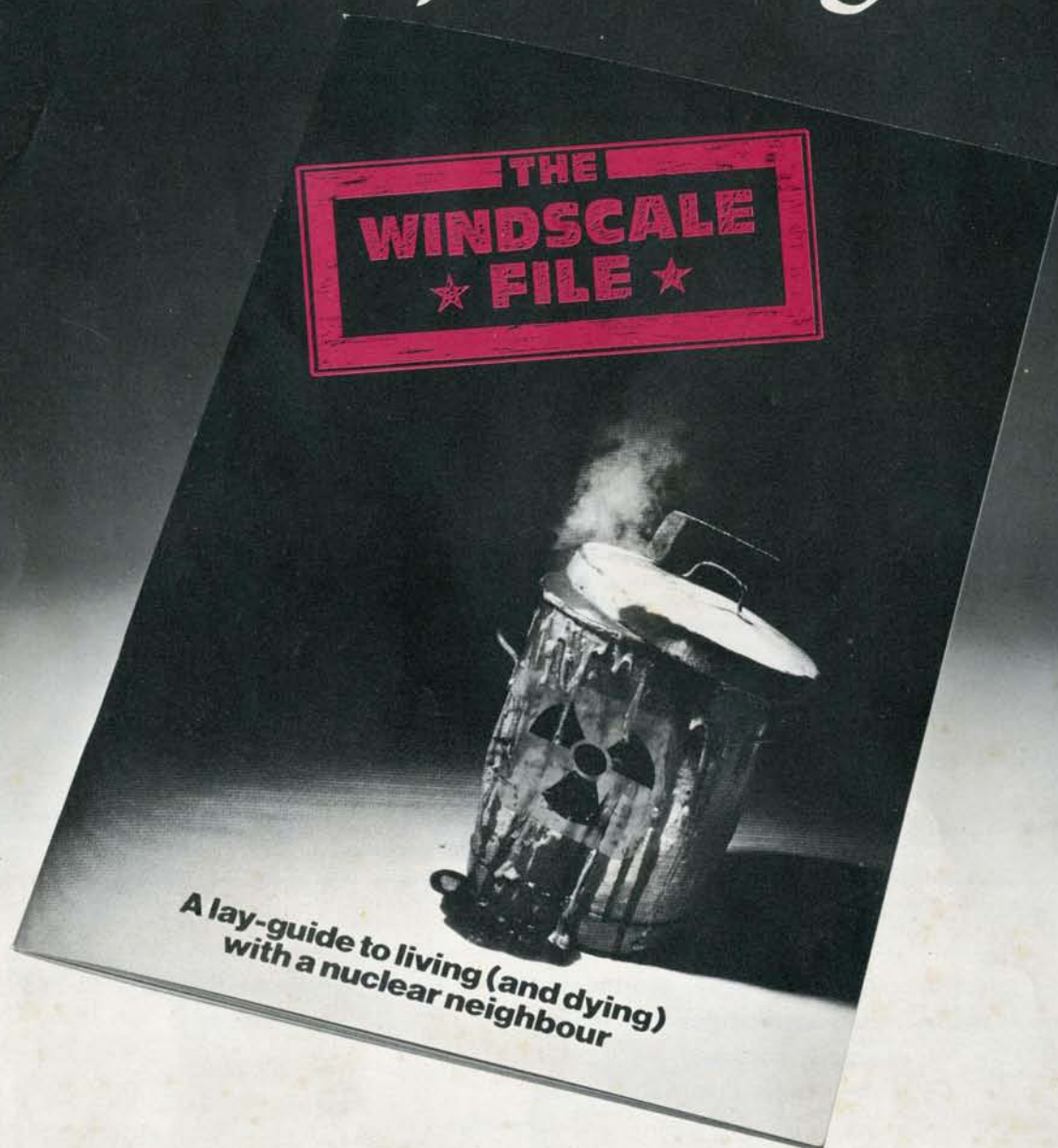
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