

# SECRETS OF SNOWDONIA

### by Graham Searle

"We will eliminate unnecessary secrecy concerning the workings of the Government.. ..so that government is more open and more accountable to the public."

Gadamit

**Conservative Party Manifesto June 1970.** 

Chrysler buys Leicester · Is ecology elitist? Technology v nature · China's way with waste

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# CHRYSLER BUYS LEICESTER

The names are the kind that fill the arcadian fantasies of urban environmentalists. Bruntingthorpe, Kimcote, Peatling Parva are redolent of cowbells, doughty farmers, rural wisdom and country wine.

The reality is something different. The villages of South Leicestershire have found progress like the rest of Britain. The new semi-detacheds with integral carports sprout like fungus between the tumbling cottages. The roads are heavy with traffic. The wealthy middle classes have moved into it in strength and commute to work in the cities of Leicester, Coventry, London and Rugby. The farming is intensive, mainly beef and dairy.

In the middle of it is an old RAF aerodrome, which later became a NATO airbase. It covers 750 acres. It has a two mile long main runway, a perimeter track and a couple of large hangars. One of them, built for NATO, has an indoor space as large as a fullsize football pitch; it is floodlit; it has meeting rooms and dormitories, offices and toilets. It is probably worth £2m.

When Bruntingthorpe first became an airfield Britain was at war. And after that war there was John Foster Dulles to assure the people that national survival depended on facing the Russians with bombs and missiles. But all the time there was an understanding, some even claim it was a promise, that when the wars were over the land would be returned to its former agricultural use.

Hitler is now dead. And comrade

Ivan is keeping the home fires of America burning with his oil and his gas. The men in the Ministry of Defence have no further need for Bruntingthorpe and they have decided to sell it. In their wisdom they have decided to sell it to the now fully American-owned Chrysler car corporation so they can use it for testing heavy lorries and cars both day and night from now until doomsday or until the oil runs out, whichever is the sooner.

To the urban environmentalist with his fantasies this is really a blasphemy against nature. Of all the rotten land uses to dream up for the heart of a rural Eden, a smelly noisy polluting disfiguring and wasteful vehicle testing centre must come out as one of the worst. One would have thought there would be outrage.

To an extent there has been. At the level of the parish councils and parish meetings there was an almost unanimous rejection of Chrysler, apart from one place where three people were in favour of them. These may have been misled by the rumours that there was no way of restoring the land to agriculcontinued on page 42

### Anglesey votes to end planning secrecy

Anglesey's planning committee decided at a meeting on the 23rd November that in future any application for planning permission for a project that would alter the character of a neighbourhood shall be advertised in the local press.

The decision was made after the committee had rescinded the permission it gave in March for the opening of a quarry at Carreg-y-Dwr, Paradwys, Bodorgan. Local people claimed that they did not hear of the proposed quarry until October. The site was in the heart of an agricultural area of considerable scenic beauty. Mr J. O. Jones, whose farm adjoins the site, was quoted the North Wales Chronicle in (12.10.72) as saying that "blasting,

dust and traffic congestion on the narrow minor road would seriously change the rural, peaceful character of the area". He was concerned, too, at the effects on the health of livestock. Others felt the quarry would reduce property values.

Two petitions were prepared. The first, presented to the planning committee on the 12th October, had 168 signatures. The second, with 746 signatures, was handed in to Aethwy RDC on the 23rd October.

The planning committee had given permission originally because it believed the quarry would provide local employment. It emerged later, however, that the owner of another quarry might *continued on page 43* 

In	this issue		
Se	ecrets of open government		
64	if they keep quiet about Things that go pump in the night by Graham Searle		
41	and when Chrysler buys Leicester by Gerald Foley		
47	is it <b>Open government or open contempt?</b> by Robert Allen		
Cu	ulture matters most		
50	two articles illustrating this important theme: <b>Technology v. nature</b> by Henryk Skolimowski technology is more a modern metaphysics than a mes of machines		
56	China's way with waste by Orville Schell the culture factor makes all the difference to pollution problems		
PI	us		
61	Is ecology elitist? by David Pearce		
43	Bio-Strath may be good for you by Peter Bunyard		
47	<b>Comment</b> Environmental legal aid Will vegetarians inherit the earth? Polychickens		
49	Gremlin		
66	Down to earth Rat-a-tat-tat, open up, it's VAT!		
68	<b>Demo-technology</b> Alternative heating trial nears completion		
69	Towards a unified science Subjective classification		
71	Friends of the Earth		
72	Books		
75	Letters		
79	Coming events		
55	In our next issue		

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Chrysler buys Leicester, from page 41

tural use, that the runways were 118 feet deep in solid concrete, that Chryslers would bring work to the area or that there was no other use for the large hangar. All are untrue.

### A smell not entirely of compost

It is when we move up the scale of local government that the air begins to smell not entirely of rural compost. The Lutterworth Rural District Council for reasons close to its collective chest is thoroughly, indeed sycophantically in favour of the Chrysler scheme. This may be a case of simple loyalty to those few farmers who stand to gain from the vehicle testing proposals because they will be allowed to rent some of the land not needed at advantageous rents. Or indeed it may be some more metaphysical perception of the community's long-term interest.

And the higher we go the deeper the mystery. Leicestershire County Council rejected an earlier application by Chrysler to rent the airfield for the same purpose, on the reasonable grounds that the proposal would contravene the County Plan, introduce industry into a rural area, and cause undue traffic in the surrounding villages. When the proposal was to buy the land these objections vanished. But a man who wanted to use the hangar as a hosiery factory-Leicestershire has a long tradition in the craft-and thereby create local jobs, and restore the rest of the land including the runways to agricultural use-this can be done at a profit by selling the broken concrete for road aggregate-had his application turned down. The grounds for the rejection were that it was contrary to the county development plan, would introduce industry into a rural area and cause undue traffic in the adjoining villages.

Right at the top is the Ministry of Defence. Their normal policy when disposing of land surplus to their requirements is to do so by tender or public auction, except in circumstances where it is clearly in the interests of the public not to do so. Their interpretation of the public interest is hard to follow. No other use appears to have been considered. Other applications to be allowed to tender were turned down. What is good for Chryslers is good for Bruntingthorpe. Even the price cannot be divulged. It's hard to stomach, but . . .

There are other questions. There was a sample noise test in which a lorry was gently trundled round the track and the recording gear was so fortuitously placed that bird-song interfered with it. Anyone who believes a linnet is louder than a lorry will no doubt be fully convinced. There was a second noise test with speed warnings to drivers at points where the tyres had squealed during the previous one.

Luckily there is a Public Inquiry where some at least of these points will be probed. But what the Inquiry will not be able to consider in any depth is that we are in the last decade of the motor industry as we know it.

This issue cannot be evaded much longer. On virtually any current reckoning of supply and demand there will be serious price rises and petrol shortages from the 1980's onwards. The motor-industry will move into being a contracting one rather than an expanding one, with profound social implications for those who earn their living from it, directly or indirectly.

In the end Bruntingthorpe is a battle in which the most important issues will not be raised. And whichever way it goes the victory will be won for the wrong reasons. But it is none the less important that the right side wins and the Chrysler application is rejected.

Gerald Foley

### Anglesey votes to end planning secrecy, from page 41

have to close down if a rival were to open nearby. At best this would negate any gain in employment, at worst it would increase unemployment.

The decision to rescind planning permission was taken by 11 votes to 10.

The decision raised legal complications and this is why the further decision was taken to advertise future planning applications. A proposed developer might be in a position to claim compensation for the loss of a permission that had been granted already and the decision might have to be justified at an inquiry, should the developer appeal. The situation should not arise if the initial application is given full and careful consideration, but this is possible only if local people are given adequate warning and an opportunity to state their views.

Michael Allaby

# **Bio-Strath may be** good for you

Scepticism is all part of the job; it's the nearest a journalist can hope to get to objectivity and a reporting of the "facts". And so it was a very cynical group of journalists who took off for Zurich in the company of Michael van Straten, chairman of the organisation that markets Bio-Strath in the UK, to be told about the remarkable properties of that health tonic with which thousands of Britons now ritually dose themselves and at no mean cost before every meal.

Over the past couple of years it has become increasingly obvious that good health and sound nutrition go hand in hand, and by the same token that all those dreadful degenerative diseases we in the West suffer from so extensively are caused to a large extent by modern methods of food production, and if that weren't enough, by the way food is prepared both by the manufacturer and then at home.

But it's quite another thing to subscribe to the idea that a couple of spoonfuls will, to crib a line, keep the doctor away; and we journalists, determined not to be suckers, were all of us on the look out for the "con". Our itinerary began with a visit to Biotta the company that bottles all kinds of vegetable and fruit juices—from potatoes and celery to oranges or in combination as a cocktail—without using any artificial preservatives or colouring agents.

The most impressive feature of Biotta is not the industrial plant-fine as it is with its stainless steel crushers for extracting the juices and the cavernous fermenting chambers where lactic acid produced by special cultures of lacto-bacillus act as a natural preservative-but the greenhouses and the outside plots of land. All organic, with no pesticides nor artificial fertilisers, the sheer abundance of Biotta's vegetables-30 kg of cucumbers to the square metre for example-could not fail to impress. One reporter, on the flight over, could not help airing his views about organic farming. It was impossible, he said, for an organic grower to compete with a grower who had no scruples about using artificial aids to control pests and disease and to push up yields. He was amazed, like all of us, at what he saw at Biotta, and I later heard his comments at the chances of his editor—a fervent and renowned anti-econut—publishing the article he was going to write.

Biotta was started eleven years ago by Dr Hugo Brandenberger—a man who was utterly determined to stick to his principles and yet make a commercial go of things. Anyone looking for signs of "muck and magic" at Biotta will be disappointed. With typical Swiss punctiliousness every plot of land has been tended carefully and the richness of the soil, with its high humus content, is there for all to see. In fact Brandenberger not only adds compost, and a fine stone dust from St Gottard, but also a culture of soil micro-organisms.

Biotta is now so successful that in just over ten years Dr Brandenberger is selling 20 times more than when he started and he can no longer grow sufficient from his land (25 acres) to match demand.

#### Organic farm co-operative

Imports must all be bona fide "organic". Brandenberger is fortunate. Some 30 years ago a friend of his, Dr Hans Müller, deeply disturbed at the movement of labour off the land and the unscrupulous use of fertiliser with little or no concern for the health of the soil, set up a farm co-operative for farmers who would abide by his principles. The number of farms has now grown to more than 700 and applications for membership are being received all the time. Biotta takes some of the co-operative's produce; the rest goes to Migros, the Swiss supermarket chain which has branches all over the country. And for those in Britain who complain bitterly at the high shop prices of organically grown vegetables



Fred Pestalozzi talking to Jimmy Young in the Bio-Strath laboratory

the co-operative's vegetables cost not a cent more than those from elsewhere. Swiss farmers do not receive government subsidies for fertilisers and the economics of farming organically are much more favourable than in the UK. It will be interesting to see what happens in Britain when we join the EEC and the fertiliser subsidies come off.

A year ago I was taken around the co-operative headquarters near Berne and afterwards to one of the farms. Mr Dahler's farm was a chastening experience for anyone used to a typical British farm with its general air of dilapidation contrasting with modern jerry-built structures. Everything wasorderly and incredibly well-kept on Dahler's farm and although only 30 acres in size it was obviously giving Dahler, his family and his parents a good living. The contrast with Biotta was also intriguing; there was nothing industrial about the farm-no glasshouses, no vast intake of 1 million litres per day of Rhine water, no oil for heating-just a marvellously maintained mixed farm of arable and dairy, and although he could have used a tractor if he wanted Mr Dahler preferred to use a cart horse. He alsomilked his 25 cows by hand, and I was informed, though not by him, that his yields were twice the Swiss national average. Nevertheless, while Dahler's farm, like the other farms of the cooperative, was extremely traditional, one had the impression that every little plot of land was considered an experiment in productivity in itself. There was nothing "stick-in-the-mud" about the farm and Dahler told me, "one must use all the subtleties of nature to make the land produce"; and unlike the modern orthodox farmer with his intensive animal units and his imports of feedstuffs, Dahler brought into the farm as little as he possibly could. The answer was not to seek maximum yields but optimum ones.

Curiously enough (could it be pure coincidence?) during the bad foot and mouth outbreak in Switzerland two years ago, not one of the co-operative's farms—and they are dotted all over the country—was affected.

### Human health

Dr Brandenberger is convinced of the power of good contained in his products. He has had tests performed on the bottled juices and he claims that all the essential ingredients, including vitamins, are preserved by the lactofermentation process which involves absolutely no artificial heating. "It's a crime to cook vegetables," says Brandenberger. "Heating destroys some very important properties." He then went on to tell us about the anticarcinogenic properties of beetroot, of celery's dilatory powers on the arterioles, of the anti-ulcer properties of potato juice and of provitamin A which comes from raw carrots, and is so necessary now that children spend so much of their time in front of the telly. And all these remarkable properties, he said, survived intact the fermentation process that he had devised for Biotta.

And so we come, or indeed came to Bio-Strath. Friedrich Pestalozzi who founded the company in 1961 is without question Bio-Strath's best salesman. Quiet spoken, not at all pushing, but with the enthusiasm all there, Pestalozzi is extremely convincing and our scientific scepticism of what Bio-Strath had done for him and his daughter when both seemed incurably ill was undeniably shaken.

Some 20 years ago Pestalozzi was told that he had Meuniere's syndrome —a chronic disease which affects a person's equilibrium to the point of continual dizziness. The rest of the story is a classic. A friend told Pestalozzi of Dr W. Strathmeyer, a German chemist, who had developed a yeast tonic for which he claimed certain curative powers. Pestalozzi went to Strathmeyer, obtained the yeast preparation and took it steadfastly for several months and found to his astonishment that he was cured.

Some years later his three-year-old daughter began to be increasingly afflicted with epilepsy. She was given Strathmeyer's preparation since when she has never thrown another fit. Strathmeyer and Pestalozzi then became firm friends and Strathmeyer, already an old man, suggested that Pestalozzi should manufacture the yeast tonic on a commercial basis. As a result Pestalozzi gave up his job in his family's large engineering concern and in 1961 established Bio-Strath.

Bio-Strath is derived from a wild candida yeast grown on 90 natural herbs, some tropical. The yeast cells are then ruptured by plasmolysis and honey, malt and pure orange juice are added to make a thick puree. Like Biotta, no artificial heat treatment is used and no artificial preservatives are added.

Pestalozzi plays down any suggestion that Bio-Strath has miraculous curative powers. According to him, because it is so well-rounded in essential nutrients some of which may still be unknown to man, Bio-Strath does little more than boost the body's powers of recuperation and its resistance to disease.

### **Independent tests**

It seems there may be a certain truth in these claims. In 1965 Pestalozzi persuaded a radiobiologist friend of his —against her sound scientific judgement—to carry out certain experiments to test whether a daily dose of Bio-Strath would make animals more resistant to irradiation compared with controls. Such resistance would be reflected in the mortality figures.

In her experiments Professor Hedi Fritz-Niggli, who is head of the department of Radiobiology at Zurich University, subjected white mice to acute whole-body radiation ranging from 500 to 800 rads. Above 500 rads there was no detectable difference in mortality rates between the two groups, the controls and the test animals. However at 500 rads the difference was sufficiently startling for Dr Fritz-Niggli to have to repeat the experiment three times before she could believe the evidence in front of her eves.

In essence she discovered that giving mice supplementary doses of Bio-Strath above their normal diet resulted in a significant reduction—from 27.8 to 11,1 per cent—in mortality. Moreover the animals which recovered, and this applied to acute radiation doses of 700 rads, were seen to put on weight more rapidly when the administering of Bio-Strath was continued after irradiation. Dr Fritz-Niggli also noticed that all the animals on Bio-Strath consumed less of their normal food.

Her findings have been somewhat substantiated by a German radiologist who is giving Bio-Strath to cancer patients before and after radiation therapy. He finds that his patients are now putting on weight despite the radiation treatment, whereas before they invariably lost weight through a feeling of nausea and general sickness —factors which in themselves very often led to their rapid decline in health.

It could be as Dr Fritz-Niggli suggests, that Bio-Strath is not only nutritious but it is gentle on a gastrointestinal tract which has been severely affected by radiation.

One of Pestalozzi's trump cards was to have invited along with the rest of us two young scientists whom he had persuaded to carry out experiments on cancer-resistance in animals fed Bio-Strath. It was the same story—the scientists, Dr John D. Ireson and G. E. Conway at the Applied Biology Department, the North East London Polytechnic, had been highly sceptical but had accepted the proposition so long as the research was paid for. Once



Visitors sampling Biotta tomatoes

again the results were in Pestalozzi's favour.

The experiments were simply to inject Ehrlich's ascites tumour either intraperitoneally or subcutaneously into mice. When injected into the peritoneum the tumour remained fluid; when injected subcutaneously it became-solid.

In both cases Dr Ireson and his colleague found a significant reduction in the size of the tumour when the animal's diet had been supplemented with Bio-Strath. In the intraperitoneal group the ascitic volume, the total number of cancer cells and the incidence of haemorrhage were all reduced. In the subcutaneous group the cancer size and the incidence of necrosis were both reduced.

In the European Journal of Cancer (1972, 8, 159) the scientists conclude that Bio-Strath appears to provide a factor "which might be lacking from the animal's normal diet and which contributes to the general level of health of the animal, its natural resistance and thereby antagonises the establishment of the cancer".

#### "Specifics"

In addition to marketing the "elixir" Pestalozzi also produces what he terms the "specifics", some 20 different products each to be used for particular conditions of ill-health. The specifics are derived from the same candida yeasts but this time grown on herbs with renowned pharmacological properties. Dr Ireson and his colleagues at the Polytechnic are now looking into the specifics to see if their pharmacological activity is as good as is claimed. They have found some specifics to have no clear-cut activity while others appear to be extremely effective —a primula derivative for example which showed remarkable anti-inflammatory properties and therefore might well alleviate the symptoms associated with rheumatoid arthritis. In collaboration with the scientists Pestalozzi is now in the process of drawing up a range of specifics.

Not yet satisfied with the few experiments that have been done so far Fred Pestalozzi is always on the look-out for new demonstrations of Bio-Strath's efficacy. He has had teachers give half their class Bio-Strath while withholding it from the rest (giving them a placebo) and apparently the children's ability to concentrate and memorise was significantly improved when they were on Bio-Strath. It has certainly boosted his morale that the Finnish team which did so well at the 1972 Olympics were all on Bio-Strath.

With orthodox scientists now working hand in glove with him, Pestalozzi is obviously succeeding in his battle to get Bio-Strath accepted by the establishment. Yet, modern man must be in a sorry state if to remain healthy he must take an extraordinary concoction of yeast and herbs such as is found in Bio-Strath. One would have hoped that a good sound diet would have been enough.



### Comment

### Open government or open contempt?

When they were seeking our votes, the Conservative Party promised to "eliminate unnecessary secrecy concerning the workings of the Government...so that government is more open and more accountable to the public". Once in office the Tories busied themselves with breaking this promise, and they have not yet stopped. Both the Conservative and the Labour Parties are now so discredited that only the persistently gullible believe them any more. Their promises are made in opposition and broken in power so lightly that to term them "promise" in the first place is to indulge in absurd hyperbole. No doubt, both parties know this, and know that we know, and think that since it's all a charade it does not matter.

Some of their promises bear out this interpretation, for they simply could not have been kept. Witness Mr Heath's promise to cut prices "at a stroke", one which could only have been made in ignorance of the economic situation or as part of a game of call my bluff.

Other promises are reasonable, easy to implement, and guaranteed to warm the heart of the most jaundiced voter. They are broken either because they were meant to be or because the government changed its mind and does not give a fig for its word. Such is the Conservatives' promise of open government.

The Department of the Environment's report on the railways, which proposed cutting them by some 40 per cent over the next ten years, is concerned neither with security nor with defence, and is of vital importance to a great many people in this country. Yet because the *Sunday Times* published a most timely article on it, its editor was cautioned under the Official Secrets Act, the offices of the *Railway Gazette* (presumably a suspected source of the leak) were raided by Scotland Yard, and one of its editorial staff harassed by the police. As noted in last month's *Ecologist* (p. 3), the Department of Environment has also tried bullying a local authority when it flouted DoE's top secret rule for new road plans. Secrecy and strong-arm tactics are an ugly combination whatever the circumstances, but totally unjustified when they are used to deny information of daily concern to an electorate promised more accountable government.

This month, we publish details of two further examples of the new openand-shut government: the tight-lipped inconsistency of Leicestershire County Council and the Ministry of Defence (see p. 41) and the information clampdown by the CEGB on its earthmoving activities in Snowdonia National Park (see p. 64).

What is strikingly obvious from these examples is that the more a project is kept secret the more difficult it is to justify; and that the Conservative Party is providing us not merely with a closed government but with a closed incompetent government. It is a government of brazen dishonesty, open only in its contempt for the people it was elected to serve.

Robert Allen

### Environmental legal aid

Public Planning Inquiries are set up by the Department of the Environment to deal with appeals against planning permission. In recent years there has been a vast increase in the number of these inquiries. Besides the famous ones at Stansted and Cublington, many others concerning new motorways, urban routeways, housing developments, green belt use, the siting of industrial and commercial premises, have been held. Some affect whole communities, some a single individual. The public inquiry has, in fact, become a major judicial procedure without the legal system, affecting thousands of people annually. It is almost certain that YOUR area has had at least one public inquiry in the past five years.

The individual or community who has been involved in a public inquiry will know how complicated and lengthy the procedure can be. Local and central government departments, and big commercial concerns, employ expensive legal and technical experts, produce expensive and complicated maps, graphs and documents. With government departments these are paid for by your rates and taxes. Faced with this, the individual, small community, or voluntary organisation is hard put to present its case. People have to be got together, money has to be collected for legal and technical advice, the inquiry has to be attended for days or often weeks. The aim of the inquiry is an objective conclusion based on arguments presented, but the unequal resources of the parties involved makes it a travesty of justice.

Urgent reform is needed to correct this injustice. Rich individuals or communities may manage to defend themselves, but what of the less well-off where money and leadership are not so available? The Secretary of State for the Environment and the Lord Chancellor should set up a Commission of lawyers and environmentalists to work out details of a system of aid to support individuals and non-profit making groups involved in planning appeals, this aid providing planning consultaancy and technical and legal advice. To define those eligible, to establish the scale of aid, to fund and administer the scheme, will be complicated, but complexity is no excuse for avoiding reform of a major injustice. Already a number of experts and 15 amenity bodies have indicated support for such a scheme of ENVIRONMENTAL LEGAL AID.

Your support would be welcomed. Contact your MP; ask your local amenity group for help; collect details of local public inquiries. Also urgently needed are *planning inquiry case histories* (period and cost of inquiry, resources of the various parties and how raised, the outcome, and any other interesting points).

Pass on such ideas for action to: Eric Robinson, Catstree Cottage, Worfield, Salop. Tel: Worfield 601. The Polytechnic, Wolverhampton, Tel: Wolverhampton 29911.

### Will the vegetarians inherit the earth?

For some years now there have been warnings against the use of hormones for fattening livestock. Those permitted for such use in this country include stilboestrol, hexoestrol, dienestrol, dianisyl hexane and thyroid stimulants.

Cancer of the breast is known to be caused by oestrogens, leukemia is on the suspect list for man and has been caused by oestrogens in animals, as have cancer of the bladder, kidney, testis and uterus.

Of such oestrogens, particularly disquieting evidence has been coming to light concerning stilboestrol. Ruth Harrison, in her book Animal Machines in 1964 quoted persuasive evidence that this hormone could be dangerous to consumers when used for fattening livestock. Indeed, the evidence given before the US Delaney, Committee had indicated that stilboestrol, besides producing sterility, could "depress the growth of children, cause cystic ovaries, cystic breasts and cystic kidneys". While these conditions would only be produced by ingestion of very large amounts, more than would be consumed by eating chicken, for instance, Dr Robert K. Enders had warned that stilboestrol becomes concentrated in the livers of chickens. It was described as being "biological dynamite".

A paper entitled Possible Cancer Hazard Presented by Feeding Diethylstilboestrol to Cattle, presented to the US Department of Health, Education and Welfare in 1956 had stated that this drug was known to induce cancer and that it was not destroyed by temperatures encountered during cooking. The use of hormones in poultry was banned in the US in 1959, but its use in cattle continued. In 1962 the Government of New South Wales banned hormones for livestock after the Australian Agricultural Council received evidence that some authorities believed that hormone residues in meat could cause malformation in children and abnormalities in adults, especially men. Our own Minister of Agriculture at that time decided, however, that no evidence of harmful effects had been found, and did not consider it necessary to ban the use of hormones in this country (Animal Machines, p. 129.)

A lengthy article entitled "The Price of Beef" appeared in *Environment* July/August 1971. It quoted a report in the *New England Journal of Medicine* of the first epidemiological evidence of a connection between stilboestrol and cancer in humans. A number of girls whose mothers had been treated with the drug during pregnancy were found to have developed a rare form of cancer in their late teens. Other effects of

stilboestrol had been recorded: development of breast cancer fibroids, excessive menstrual bleeding, sterility and impotence in men. The British Medical Journal in September 1971 stated that stilboestrol had been used on a small scale for some time to fatten some veal and poultry and had been passed as safe under the Voluntary Veterinary Products Safety Precautions Scheme: "This body was last week superceded by a Veterinary Products Committee set up under the Medicines Commission, and it is to be hoped that the new body will examine the facts afresh".

In March 1972 a concentrate for pigs containing diethylstilboestrol was available in this country. On 17th April, Mrs Joyce Butler MP asked the Minister of Agriculture, Fisheries and Food if he would seek powers to ban the use of stilboestrol as a growth promoter for pigs in view of its dangers to human health. The reply given by the Parliamentary Secretary, Mr Peter Mills, was:

"The Veterinary Products Committee has advised us that on present information any carcinogenic hazard likely to arise from such use is not sufficient to justify any special controls. However, the Committee made representations in relation to injectable oestrogens used in veal production which my Hon. Friend is considering".

A Press announcement in August 1972 stated that implants of Diethylstilboestrol will not be permitted in the US after 1st January 1973, and manufucture of the drug was banned from 31st July 1972. Twenty other countries have made it illegal to administer hormones to food animals. (In this country they are used not only for fattening but for hastening maturity, increasing and synchronising heat periods and inducing multiple births.)

The Times of 2nd October reported cases of genital cancer in young women treated with stilboestrol after 20 years' treatment. Perhaps the last word should be left with Dr Enders, testifying in 1951 before the US House Select Committee investigating Use of Chemicals in Food:

"Because of the proof that enough of the drug to cause changes in the reproductive tract of the human can be ingested by eating treated chicken, because of the danger of having so powerful a drug so easily available, because of the economic loss to the consumer who pays protein prices for contaminated fat, I believe that it is against the public interest to permit the use of any hormone or hormone-like drug in the fattening of animals. If this practice becomes widespread we may be able to paraphrase, and say 'The Vegetarians will inherit the earth'."

And still no news from our Hon. Friend. Joanne Bowers

### Polychickens

British food technologists achieved a new breakthrough this autumn when they introduced a process for increasing the weight of chickens after slaughter. By injecting sodium polyphosphates and water it was found possible to add 6 per cent to the weight of housewives' weekend poultry. Since the gain in weight is exactly equal to the weight of the chemicals and water injected and since these are cheaper than poultry meat, although retailed at the same price, the profitability of the injections is beyond doubt.

Of course, there are those who object to any innovation. It has been pointed out that should the hypodermic be placed into the skin, rather than the muscle, of the bird, the result will be discoloration resembling that caused by disease. Some have even gone so far as to suggest that man was not designed to consume solutions of sodium polyphosphates and that his health may be affected adversely by the ingestion of them repeated over a long period.

Such objections ignore the urgent need to find new uses for polyphosphates now that their popularity as an ingredient in detergents is waning as a result of pressure from reactionary ecologists.

The cruellest blow, however, has come from Dr Samuel Phillips, Birmingham's senior administrative officer for environment services. He is reported in the *Sunday Mirror* (3.12.72) as objecting to the chemical injections on health grounds and also because it strikes him as slightly dishonest to sell sodium polyphosphates and water as chicken. His committee has referred the matter to the new Minister for Consumer Protection, Sir Geoffrey Howe. *Michael Allaby* 

### Gremlin

#### Let not thy left hand know . . .

"We are pro-bus because only the bus can preserve civilised life in our towns and in the countryside".

(Eldon Griffiths, Under-secretary for the Environment).

#### ... what thy right hand doeth-

"It is the motor car which offers the greatest hope to rural areas, provided it is shared more freely".

(Eldon Griffiths, Under-secretary for the Environment).

#### Eco-porno-bandwagon



From the New Yorker, 4.11.72, with thanks to Not Man Apart.

#### Shell shock

Shell have found a novel way of helping us remember those birds threatened with extinction by the oil companies (including of course Shell). They name their North Sea oil fields after them.

One field is called Auk to remind us how reduced in numbers is the Auk family, thanks to surface oil slicks. For example, 3,000 Guillemots were breeding on the Isle of Wight in 1937 but only 10 in 1969; 10,500 Razorbills were on Lundy Island in 1939 but only 600 in 1971; and the population of Puffins on Annet (Scilly Isles) was about 100,000 pairs in 1908 but only 50 today. Oil pollution has played the major part in this destruction.

The other field is called Brent, a remarkably prescient appellation since the construction of Foulness airport will sharply reduce the world population of the Brent Goose, though doubtless not the consumption of Shell aircraft fuel.

Yet neither is an adequate memorial, since their estimated lifetimes are from 15 to 30 years. Maybe it's a race to see which will end first, the fields or the birds.

Shell are now looking at a third structure, but several more wells must be sunk before they can be sure they have another productive field. They are optimistic enough, however, to have given the structure a name: Cormorant.

I wouldn't be a cormorant for all the oil in Shell PR.

### Goss the Father, Goss the Son, and Goss the Holy Ghost

We are at last able to announce that there is no formal connection between a planner called Goss and Rio Tinto Zinc Ltd.

Not so long ago a planner called Goss, acting as an external examiner to a Polytechnic in the vicinity of Madame Tussauds, rejected a thesis which dealt with RTZ's intended rape of Snowdonia. The student was told it was not the sort of thesis which was acceptable to the examiners. There was, however, no criticism of its actual content. Neither could the student appeal to the Academic Board since there was no new evidence to present: the evidence was all in the thesis.

Result: much muttering about possible connection between a planner called Goss and a company called RTZ. And all unfounded. The situation was made plainer more recently when to everyone's surprise a planner called Goss lavished much praise on another thesis about RTZ in Snowdonia. Suddenly this was just the sort of thesis he'd been looking for: problems of our time and all that. Again no criticism of the actual content, but this one was acceptable. Hardly surprising really. After all, this student had the benefit of the supervision of a planner—called Goss.

### Worldwide Benn on all nuclear tests

Since that zealous new New Zealand Prime Minister said he wanted politicians to volunteer to go to the French nuclear test site in the Pacific and get blown to bits in the interests of peace, his office has been swamped with thousands of letters, all of which bear a Bristol postmark, saying "Please take me", and signed A. Wedgwood Benn. The New Zealand Government are treating the letters as a hoax. The British Labour Party are treating the letters as an opportunity.

### And now, live from Cornwall . . .

The *Ecologist* is suffering from rural shock: too many trees and not enough street-lamps; too many meadows and not one multi-storey car park.

Our friend Marjorie, otherwise known as Mother Earth and once so indulgent about the wayward ways of nature, now nurses a murderous hatred of buzzards. One of them spotted a bantam of hers and sensibly ate it. According to her, it is a very rare breed of bantam. She does not seem to appreciate that the ways of nature are not so wayward: now the breed is rarer.

Mrs Allen, finding the grass gets on her nerves, has started buying plastic flowers. Bunyard has been learning an ancient language, which we thought was Cornish, but has turned out to be Hebrew. Allaby has started brewing barrels of beer. For everybody whenever we have something to celebrate, he says. But he's the only one who goes home to lunch.

Goldsmith and Bunyard are busily saving rare domestic animals from extinction. Their first buy was some lopeared pigs, of which there are about a million. The pigs are not ungrateful. One of them was seen near Wadebridge, four miles from the farm. Rumour has it that it had grown so fond of Goldsmith that it followed him to work.

## **Technology v. nature**

### by Henryk Skolimowski

It has been suggested that our hostile attitude to the rest of nature is part of our Judeo-Christian heritage. The author, in arguing that technology is a part of our metaphysics, shows that this is not so. It is much more recent, and only by changing this attitude can we render technology harmless.

The rapid use of technology is a phenomenon of the modern world. Before technology could expand, we had to acquire a rather special attitude towards nature. Modern technology is an instrument designed to control nature. It could not have evolved, at any rate not in the form it did, before we had conceived the idea of the conquest of nature.

### Greek ideals and technology

The first and fundamental question is: Why did technology not develop in the ancient world? It is intriguing that the Greeks did not use technology in our sense as labour saving devices, as instruments for the mastery of the outside world. The Greeks were after all incredibly inventive. And not only the Greeks in the Hellenistic age, which is known for its mechanical inventions mainly owing to the genius of Archimedes and Hero of Alexandra, but also in the classical period. We know a great deal about the intellectual and cultural climate of the golden period of Ancient Athens. But we are much less aware that all kinds of extraordinary gadgets were employed at

Dr. Skolimowski teaches at the Department of Humanities, College of Engineering, University of Michigan at Ann Arbor. that time; some very clever and sophisticated, as for example machines designed to mimic human behaviour. But it was all for the purpose of entertainment. Hardly any attempt was made to employ these gadgets in the process of, as we would call it today, industrial production.

No doubt this can be attributed to the Greek ideal about what kind of life is worthy of a man. Witness in this context Plutarch's opinions about Archimedes and how disparagingly Plutarch talks about Archimedes' inventions:

Archimedes possessed so high a spirit so profound a soul, and such treasures of scientific knowledge, that though these inventions had now obtained him the renown of more than human sagacity, he yet would not deign to leave behind him any commentary or writing on such subjects; but repudiating as sordid and ignoble the whole trade of engineering and every sort of art that lends itself to mere use and profit, he placed his whole affection and ambition in those purer speculations where there can be no reference to the vulgar needs of life.

Archimedes is said to have constantly apologised for his inventions and justified them as mere amusements, as diversions, as useless toys. Thus, a human being or a citizen, as contrasted with a slave or an animal, was a man who did not sully his hands with manual work, whose art did not lend itself to mere use and profit. In such an intellectual climate, technology had little chance to develop, not because slaves were sufficient or slave-owners did not want labour-saving devices, but because it was morally and intellectually repulsive. And these moral and intellectual constraints had a great power over the Greek mind.

There is one element which I find constantly missing in various accounts of ancient technology. This element is the attitude towards nature. Around 600 BC the Greeks chased the gods from their universe and attempted to give natural explanations to phenomena which had previously been explained by reference to the intervention of the gods. Perhaps the efforts to comprehend the workings of nature in non-theosophic terms was great enough and the Greeks were unable to have gone a step further towards controlling nature. Yet, I believe that this was not the case. It seems that it was not because they lacked the capacity or mental resources that they did not attempt to control nature, but rather because of their basically symbiotic relationship with nature. It seems that the Greeks did not separate nature from the rest of their universe clearly enough. This separation was only to happen in modern times. Thus they did not consider nature as object outside, fixed and ready for exploration, independent for its existence from us. Nature, as it were, was too close to them to be objectified.

Perhaps the clearest evidence that the Greeks did not objectify nature sufficiently is the fact that they did not develop the experimental method. They did develop imaginative conjectures and hypotheses about nature. But they were satisfied with the rational power of their conjectures and explanations. They did not test these conjectures and explanations against empirical reality. The concept of nature, as something constant, immutable and firmly established out there against which we test our hypotheses was not a part of ancient science. This is what the rationalist tradition meant in ancient Greece. Because of their conception of nature the Greeks could not have developed the idea of empiricism as practised in modern

science since Galileo. And this also explains why they could not have conceived the ideas of controlling and conquering nature.

### Medieval theology and technology

Another hypothesis which we must examine claims that the roots of modern technology are in the canons of the Judeo-Christian religion. The Judeo-Christian scriptures, it is argued, present man as ruthlessly lording over nature, and nature as the object of his will and rule. The basic premise of this argument appears to be that the destruction of the environment was written in the blueprint given to us on Mount Sinai.

The view that modern technology is rooted in Judeo-Christian teleology is advocated vigorously even by such eminent historians as Lynn White. He argues that a new system of agriculture in the Middle Ages was an expression of a new attitude towards the soil and thus towards nature. "Man's relation to the soil was profoundly changed. Formerly man had been part of nature: now he was the exploiter of nature. Nowhere else in the world did farmers develop any analogous agricultural implement. Is it coincidence", White asks, "that modern technology, with its ruthlessness towards nature, has so largely been produced by descendants of these peasants of northern Europe?" White continues his argument by suggesting that the new Frankish calendars set the style for the Middle Ages showing "men coercing the world around themploughing, harvesting, chopping trees, butchering pigs. Man and nature are two things, and man is master".

These are very interesting arguments. But are they substantial enough? Is ploughing really coercing the world? If this is so, then the coercion of nature started to occur at the time when man, the hunter, became man, the farmer. And then Lynn White's argument collapses. Moreover, is it not the case that the Middle Ages invented rotation farming thereby emphasising their care for the soil? Furthermore it seems that Lynn White reads too much in the pictures of the medieval calendars. How much can we really deduce from calendars about people's world views?

Thus, we need much firmer evidence for the view that the aggressive tendencies of modern technology have their roots in the Judeo-Christian tradition. Can this evidence be found in the book of Genesis as some wish to suggest? We read there that man was created in the image of God who gave him "dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth". The crucial term here is of course "dominion". If this term is to be understood in the sense in which it was used in reference to political empires and dominions, such as the Roman Empire and the British Empire then dominion is indeed the territory for exploitation and plunder. But there is no reason to suppose that this was the intended meaning of the Scripture. On the contrary, there is every reason to suppose that it was not. Man, systematically destroying his dominion, would be a very poor image of God. Alternatively, it could mean that God had wished to project a very poor image of himself, which again is nonsense. In the third interpretation it follows that if man, created in the image of God, is designed to destroy his dominion, so is God set for the same task, as man only reflects God's intentions. Such an interpretation suggests that God is a malicious monster who created the world for the pleasure of its destruction; which again is an absurd conclusion. Thus the suggestion that the aggressive tendencies of modern technology have their source in the Judeo-Christian tradition leads to nonsense.

This suggestion is nonsensical for another reason. The doctrines of the church which were the foundations of the medieval world are certainly a part of the Judeo-Christian tradition. These doctrines may be considered the ultimate manifestation of this tradition. The conception of the world and of man as embodied in these doctrines stand in explicit opposition to the idea of man as the ruthless exploiter of the earthly kingdom. It is universally known that the ideal of the medieval man was not the conquest of nature but of himself, not the mastery over nature but the mortification of his flesh. For the sake of eternal salvation, the external world had to be disregarded, treated as a transient stage full of temptations on the path to eternal glory. And indeed this world was disregarded, pushed to the periphery of human existence, treated as a sinful bondage.

To the medieval man, inspired by the doctrines of the church, nature served no purpose in the overall scheme of salvation; indeed it was a hindrance. In this context, it would make no sense whatsoever to talk about man's expansive drive towards the domination of nature. Nature was a dormant aspect of man's existence, a bondage rather than an element of satisfaction and gratification.

### The discovery of nature

When we compare the paintings of the Middle Ages with the paintings of the Renaissance we become immediately



aware of the vast difference between the Medieval and the Renaissance outlook on nature. For the medieval painter nature hardly existed; the content of the painting was the inward world. This is also true of the great masters who lived in the period of transition from the Middle Ages to the Renaissance, such as Giotto. The Renaissance as we know, discovered perspective. The discovery, or perhaps we should say the invention of perspective, was necessary for the discovery of nature in a true sense. For the medieval painter perspective was not essential at all. For the Renaissance painter, on the other hand, so deeply steeped in the external world, perspective was of vital importance.

Turning from the inward to the outward world had innumerable consequences. One of them was the discovery of nature most strikingly manifested by the Renaissance painter. It is inconceivable that technology would have developed as an instrument for controlling nature without the prior discovery of nature. Nature became objectified: first an object of aesthetic contemplation, then an object of exploration, and finally the object of exploitation. We had to discover nature first in order to be able to rape her later.

### **Francis Bacon**

Sixteenth-century science worked with the axiom that no authority whatsoever should be obeyed, that only the actual unbiased investigation of nature can provide genuine knowledge.

No one exemplified the spirit of the new science better than Francis Bacon (1561-1626). He was the most articulate spokesman for the new science, although alas not its most successful practitioner. Bacon was one of the prophets of the experimental method in science. We must purge our minds, he urged, of all prejudices, refine and purify it; and then in the state of intellectual nirvana we shall be ready for the communion with facts. Uncontaminated facts, shining out there in nature, will reveal their truth to the uncontaminated mind and this will be the basis of genuine knowledge. The concept of the unbiased investigation of nature was of course right. The concept of the mind entirely purified of all prejudices and preconceived notions was of course wrong. What is important in

Bacon is not detail but the general concept of the experimental method. But still more important was Bacon's overall ideal of knowledge. *Knowledge is Power*, he announced at the end of the 16th century. The Baconian programme became a dominant characteristic of the Western intellectual tradition for three centuries.

Bacon's succinct motto is enormously important for another reason. In it there are the roots of modern technology. We need to change only one word in order to obtain a perfect description and justification of modern technology. Instead of saving "knowledge is power", Bacon should have said "technology is power". Then Baconian programme the overall fits perfectly the development of Western society during the last three centuries and the last century especially. Modern technology, I have argued, consists not only of tools, but also the ideology regarding the purposes these tools are to be used for, and also regarding the concept of man in the universe. The ideology for the expansive drive of modern technology was provided by Bacon. He wrote: "Man, if we look for final causes, may be regarded as the centre of the world. insomuch that if man were taken away from the world, the rest would seem to be led astray, without aim or purpose ... For the whole world works together in the service of man; and there is nothing from which he does not derive use and fruit ... insomuch that all things seem to be going about man's business and not their own". This is a bold and assertive programme.

Thus, one of the most important of Bacon's endeavours was the shift of our vision from knowledge conceived exclusively as the source of enlightenment, the Greek ideal, to knowledge conceived as the source of our domination over nature, the ideal of the modern occidental mind. We should not overlook the fact, however, that Bacon was not a crude pragmatist, he did cherish knowledge for the sake of enlightenment in the truly Greek fashion, but in addition to this ideal. he conceived of knowledge as the instrument of power. Obstacles to knowledge were to be removed and new strategies for the acquisition of knowledge were to be designed in order to make this knowledge useful, instrumental, powerful. In this scheme the value and utility of the knowledge of the ancients, Bacon beautifully argues, is of no avail: "The wisdom which we have derived principally from the Greeks is but like the boyhood of knowledge and has the characteristic property of boys; it can talk but it cannot generate for it is fruitful of controversies but barren of works". As with all ideologies Bacon's programme served many purposes, one of them being the liberation of man from the hermetic castles of medieval theology.

What makes Bacon so important as the prophet of modern technology is his vision of knowledge as power, a concept alien to the Greek mind. However, the implementation of Bacon's programme was not possible without further explorations of nature and in particular without its quantification.

#### The quantification of nature

It was Galileo Galilei (1564-1642) who conceived the programme for the quantification of nature. In a famous passage on the language in which the book of nature is written he said, "Philosophy (which at that time meant science too) is written in this grand book, the universe, which stands continually open to our gaze. But the book cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics ... without which it is humanly impossible to understand a single word of it; without these one wanders about in a dark labyrinth".

This programme was followed for the next three centuries of scientific development. Galileo's mathematical vision of the world, it might be argued, contains nothing new. After all, it was the Pythagorean concept of the mathematical harmony, of the number, that holds sway over the flux. The similarity is striking but should not be over stressed. For while Pythagoras was a mystic, Galileo was an empiricist. It was the empirical world discovered by the Renaissance which Galileo was exploring mathematically. But mathematics was only an instrument for the formulation of results. Mathematics alone could not be a method for the acquisition of new knowledge. The actual method of acquiring knowledge was experimental:

empirical testing of the consequences of hypotheses by means of which we try to grasp the world around us. The basic difference between Bacon's experimental method and Galileo's is that whereas Bacon urges us to start with facts and experiments and to induce theories from them, Galileo insists that we must start with imaginative hypotheses and only at the end subject them to empirical tests. Imagination can and must violate common sense. "I cannot find bounds for my admiration", Galileo wrote, "how the reason of Aristarchus and Copernicus has committed such a rape upon their sense as despite them to make herself mistress of their belief". Similar eulogies about the value of imagination can be heard three centuries later from Einstein. "Imagination is more important than knowledge. Knowledge is limited, imagination embraces the world, stimulating progress, giving birth to evolution". Now, we must be perfectly aware that it was the Galilean conception of science that has finally triumphed, not Baconian. But we must be also aware that the clouds of the Baconian conception are still shrouding the minds of many people.

The supreme architect who executed the design for the quantification of nature was Isaac Newton (1647-1727). Newton followed Galileo's programme to the letter. But it took quite a few decades before the first alphabet for reading the book of nature was pro-Philosophiae vided in Newton's Mathematica Principia Naturalis (1687). It took yet another century after Newton's Principia appeared before the mechanistic model of the universe as based on Newtonian mechanics finally appeared. The universe came to be viewed as a huge, but perfectly working clock whose laws are not only discoverable but discovered. All explanations to be considered genuine had to be mechanistic explanations or reducible to mechanistic ones. Now the quantification of nature was accomplished. Whatever was not quantifiable was considered either non-existent or unimportant. It was at that time that science completed its task for technology, and technology was ready to start its conquest and subjugation of nature.

We have reconstructed this story in order to show the intricacy and complexity of the process which led to the development of modern technology. This process contained a number of preconditions which had to be fulfilled before technology could acquire its full potential. In realising these conditions, we have acquired in other words a certain frame of mind which is known as the rational modern European mind. Technology is thus not so much a collection of tools and machines as a state of Western mind. Heidegger's declaration that technology is the last stage of metaphysics becomes meaningful in this context. Our inability to come to terms with technology is no doubt related to our infantile naivete about its nature. It is still assumed that technology is "indifferent", that it contains no metaphysics, and that its relation to traditional metaphysics is none. All these assumptions are an expression of an infantile mind.

Technology, as we know it today, is a historical phenomenon born of a certain idea of nature, of a certain idea of progress, of a certain preconception about the deterministic structure of the world and also related to specific social ideals and specific visions of the ends of human life. As such, it is laden with the elements of traditional metaphysics.

### The utopian heritage

So far we have discussed mainly the intellectual and scientific components which were prerequisite for the emergence of modern technology. In addition to these cognitive factors, we must consider the social ideals whose influence has been profound but much less tangible. These ideals were embodied in some great utopias of the Renaissance and post-Renaissance period. When the religious structures which justified man's craving for the transcendent were punctured, secular structures offering man new transcendental goals had to be invented. It is at this point that the idea of progress was born. The concept of progress as a secular category thus replaced the old concept of progress which was a religious and spiritual category. We have secularised our goals but they were still the goals beyond our immediate reach; in this sense they were transcendental goals. Thus, we can easily see that the powerful sway of utopian thinking pervades the development of modern science and modern technology. We simply delude ourselves if we think that this development was rational through and through, free from mythology and free from utopian thinking.

### Rousseau and the first revolt against progress

Jean-Jacques Rousseau (1712-78) represents the first revolt against the ideology of modern science and technology. This revolt was carried on under the banner "down with civilisation". Civilisation for Rousseau was tantamount to the evil force which deprives us of freedom and thus of



humanity. When we examine the notion of civilisation as conceived by Rousseau, we realise at once that Rousseau fought against the programme of liberation as formulated by Bacon and the Encyclopedists and as based on the idea of progress. But Rousseau's was also a programme of liberation. Man is born free and vet wherever we look we see him in chains, Rousseau emphatically announces. Thus, we witness here the clash of two programmes of the liberation of man from the tyranny of extrinsic forces. The extraordinary thing is that Rousseau wanted to liberate us from what had been previously conceived as a form of liberation from some other constraints and tyrannies.

Rousseau effectively argued that civilisation has imposed on us artificial needs. The pursuit of these needs has alienated man from his essence, deprived him of his humanity. The tyranny of artificial needs is the greatest malady of mankind because it has fundamentally impoverished the individual life of man. This diagnosis is of course alarmingly contemporary. Rousseau was absolutely prophetic in analysing the predicament of the 20th century technological society.

How can we regain our lost humanity? asks Rousseau, a question even more relevant today than it was in Rousseau's time. Rousseau's solution was the doctrine of individual salvation. Civilisation and the artificial needs it imposes upon us must be defied by opting out from society and civilisation. Man must return to nature, thus to himself, thus to his essence through the individual act of defiance-not a rebellion against the social system but rather a liberation from the web of artificial needs and phoney relationships of technological civilisation. The hippies have a great and outspoken predecessor in Jean-Jacques Rousseau.

Essential to Rousseau's new philosophy was his new concept of nature. Nature was treated by Rousseau not as an object for exploration in order to satisfy man's material needs, but rather as a part of his spirituality, as a primordial state of harmony which we must reach in order to regain humanity. Nature is thus for Rousseau an imaginary matrix, the ideal where the symbiosis of the individual with the outside and with his inner essence takes place.

### Marx—a revolt against progress in the name of progress

A century later another powerful voice protested against the suppression of the individual and the deprivation of human dignity by the all-enveloping system of expanding technology. This was the voice of Karl Marx (1818-83). I am referring here specifically to the philosophical views of the young Marx, particularly as expressed in the Economic and Philosophical Manuscripts of 1844. There is no question that Marx's primary concern was the liberation of the individual, of the human being, from the tyranny of objectified relationships which he inadvertently imposes on himself. Thus Marx's is a Rousseau-like programme of the liberation of man from the constraints and tyrannies of the external world. But Marx saw these constraints and tyrannies through the spectacles of a moralist who witnessed the effects of the industrial revolution. The process of alienation, another name for which is dehumanisation or the estrangement of man from his essence. is the process of objectification, the process during which man, the human being, becomes an object. In Rousseau's times this estrangement occurred through the submission to artificial needs (as Rousseau calls them). In Marx's time the main form of this objectification was alienation through the buying and selling of human labour. This was the negative aspect of the otherwise rational, secular and scientific world in which Marx believed so passionately. He set himself to rectify this aspect in his own way.

Marx's attitude towards technology is rather complex. But there is no question that he saw in expanding technology a necessary condition of the liberation of man. Man must first liberate himself from the constraints of the natural elements and then liberate himself from technology. The most important task for his own time Marx saw as the liberation of man from the tyranny of the machine, which was the result of the unfortunate social system. The reformation of society was the necessary condition for the return of man to himself, to his essence, to his lost humanity. The evils of technology are due to the structure of society. We must change this structure in order to enable technology to bring about the liberation of man.

Although Marx was intellectually independent in many ways, he was profoundly indebted to Rousseau in his conception of man not only implicitly, but in the very terminology he used to defend the dignity of man. But there is one fundamental difference between Rousseau and Marx. Whereas Rousseau's programme of reform was individual and consisted of opting out from civilisation and society, Marx's programme was social and consisted in calling for a collective effort to change the structure of society. Thus we witness here two basic types of possible remedy against the suppression of the individual human being by objects and relationships he has inadvertently developed. Rousseauian-individual, and Marxian-social. Both have been tried. Both have failed.

The problem of alienation haunts us now more than ever before. We are at the mercy of the increasing quantity of objects which saturate and atomise our human environment, which constantly require our attention, and which condition us to ever new and often artificial needs. According to the original conception, spelled out in many utopias, technologies were to be invented to gratify our genuine needs. Now we have reversed the formula and indeed perverted it: needs are artificially created to satisfy the demands of technology. And this is by no means a trivial problem. We craved to be saved by technology; now we crave to be saved from technology.

Where shall we turn for a possible solution? As we have said, there is the individual solution, as exemplified by Rousseau and the hippies. And there is the social solution, as exemplified by Marx and the revolutionary students. Neither sheer escapism, as in the case of the hippies, nor anarchistic revolution, as in the case of militant students, will carry the day. The dearth of constructive programmes among revolutionary students and the hippies renders their negations an act of despair, not a genuine revolution.

Can there be a third solution? At first sight it does not seem so. Yet, when we analyse the situation with some care, the third solution can be discerned. Now, Rousseau suggested an individual solution; and he treated nature as subject. Marx suggested a social solution; and he treated nature as object. Thus we can distinguish two different approaches and two different concepts of nature. What I am going to suggest as the third possibility, one that has not yet been tried in the modern occidental world, is that of combining the treatment of technology as subject with the social approach. The few remarks I can offer here do not pretend to provide a programme. We must work towards a new social utopia. Buckminster Fuller summarised this succinctly in the phrase, Utopia or Oblivion. In this utopia we must treat nature as subject, as a part of ourselves, as a part of our outer skin which cannot be damaged without causing damage to ourselves. This may require the development of a religious reverence of nature, characteristic of some Renaissance painters and of some oriental societies. And this will also require a change in our social institutions and social relationships which for the time being are set in the opposite direction-towards further growth of technology for the sake of personal profit, and at the expense of whoever and whatever is in the way. If this reverance for nature becomes a new imperative, then technology will become harmless. Whether this programme (the third solution) can be implemented in a cold, rational way, nobody can say; more likely it will require a sort of religious inspiration and fervour, characteristic of new departures in human thought.

### Conclusion

Technology is a part of our intellectual heritage; it is a component of our



view of man and of society. We cannot redirect its course, by assuming, as is too often done, that technology is a huge chariot which will move whichever way we guide it. Technology is not a chariot and what we need is not a more skilful charioteer. Indeed, technologists are the least suitable people for redirecting the course of technology because their thinking has been more corrupted by the concept of technology as power than the thinking of other people.

What we must do is to shift our vision in a fundamental manner, away from the ideology of modern science, away from the further quantification of nature, and from modes of life directed towards further multiplication of material goods (which will further atomise and mutilate the texture of our human and social life), and towards a new model for a symbiosis between man and nature.

As it was difficult for the Greeks to think about their technical inventions in terms of their utility, so it is difficult for us, and will be for a long time, not to think about technology as power, not to think about nature as an object of exploitation. We have to evolve humanised social models based on qualitative, not quantitative, criteria. The return of man to nature will be the return of man to himself; the restitution of the basic qualities of life will be at the same time the restitution of our symbiotic relationship with nature. Once this new vision becomes a reality, becomes the defining characteristic of man's new horizons, we shall have to draw, relentlessly and unhesitatingly, the consequences which follow from it regarding changes in our economic and social structures. It should be crystal clear that this new vision cannot be maintained unless specific and appropriate changes are made in the social and economic structures of our society.

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**ERF**—an ecological play, Greenwich Theatre, Sunday, February 11, 7.30 p.m. One man show by Rob Inglis about 21st century Neasden Neanderthalers encountering computerised knowledge. "A party pantomime with grim undertones"—*The Stage*. "Our politicians should see Erf"— *Australian National Times*.

### Accidents will happen

West Germany suffered its worst ever oil pollution disaster when vast quantities of oil escaped from a pipeline near the Dutch border. According to the *Guardian* of 6.12.72, half a million gallons of crude oil were lost, but the *Times* of the same day reported the figure as either a million gallons (estimate of officials in charge of clean up) or 110,000 gallons (estimate of the pipeline company).

A fountain of oil between 15 and 20 feet high (*Times*) or 30 feet high (*Guardian*) spread a layer of pollution over several square miles of land, streams and waterways were fouled, and the drinking water of local farms contaminated. Officials expected lasting damage to the surrounding agricultural land.

The breach in the line was at an unmanned pumping station at Octrup. The automatic alarm system, designed to go off whenever there is a fall in pipeline pressure, failed to work, so that pumping continued for half an hour after the breach occurred.

### In our next issue

**Railways: the fight is on** by Irene Coates. A prominent member of the Conservation Society's National Working Party on Transport explains the secret DoE report on the railways leaked to the *Sunday Times*, the arguments against it, and why we must expand our railway network.

I had a vasectomy by Harold Rurlander. A factual, straightforward account, giving one man's reasons for having a vasectomy, and explaining what exactly it involves.

**Coal and the common** by Harford Williams. The rape of South Wales continues with the predations of the Open-cast Executive upon Llantrisant Common, Glamorgan.

Three institutions for the stable society by Herman Daly. One of America's most interesting economists proposes three institutions for the stable society: the first to maintain a stable population, the second to minimise resource depletion and pollution, and the third to ensure the harmonious distribution of wealth.

**Plus** news, comment, the regular columns, and of course Gremlin.

# China's way with waste by Orville Schell

The Chinese language has no word in common usage for "ecology". With a population over three times that of the US and a rapidly expanding industrial base, the Chinese have so far escaped many of the severe environmental problems which the US and other industrial nationsincluding the USSR-face. The prospects for the future are not without uncertainties as China continues to develop and her population continues to expand. But her successes to date in avoiding a rapidly deteriorating situation of polluted rivers, un-breathable city air, massive waste disposal problems and the depletion of non-renewable resources present an interesting alternative for western "industrialised" or "developed" societies to contemplate.

While the Chinese appear to be relatively unconscious of environmental problems as abstractions, they are not unconscious of the principles of social, political and economic organisation which have helped them avoid eco-catastrophe. In seeking to build a revolutionary society, they succeeded



in avoiding many of the symptoms of a capitalist society. It would be fairer to say that the Chinese have not so much solved their problem of pollution, but that the problem of pollution was never inherent in as large a scale in the design of Chinese Communist society as in most capitalist societies. This means that both the problem and the means which the Chinese have at their disposal to solve the problem are quite different. The Chinese environment is not the victim of a value system which condones waste as profitable or efficient. Chinese have always had to operate on a very thin margin of surplus. Food has, of course, been scarce, but so have other products and natural resources. Given this scarcity and limited capacity of production to provide for such a large number of people, there has always been a builtin value stressing non-waste.

Scarcity and non-waste as a way of life grew logically from necessity before 1949, when survival was the main issue confronting a large part of the Chinese people. But since 1949, as distribution has been equalised and production has been increased, nonwaste as a revolutionary value has been elevated from a simple necessity to a virtue. It has constantly been stressed in campaign after campaign. Consequently, the Chinese have not only played down the importance of consumer goods (in comparison to the USSR or the US, for instance) in the daily lives of its people, but they have played up the need to re-use or "recycle", a word which has only recently been in vogue in western environmental circles. And thus in both agriculture and industry, as well as in one's private life, one is constantly exhorted to "convert all waste to treasure", or to adopt the slogans of "comprehensive use" which calls for all parts of any raw material in any industrial process to be converted into useful products.

The real motive is not "beautification" but more efficient use, because there is still not abundance. When the Chinese are taught in school to struggle against the "four wasteswaste material, waste gas, waste water, and waste heat"-they are not asked to do it in their ecology seminars or by cleaning up beer cans off highways on weekends. Litter to a Chinese appears to be seen not as ugly, but as useful. This is the reason it is collected. saved, and re-used. The salvation of the Chinese environment is more than a nostalgia for a time when things looked better or smelled better, it is the natural reaction of a people who cannot afford to waste, and who, in the process, have come to view waste as unethical.

### Ethic of non-waste

Behind this ethic of non-waste are the realities of a socialist economy, rich in manpower and relatively poor in automated industrial power. In the capitalist countries, resources are relatively cheap in relation to manpower. Very simply, then, this means that from a cost effectiveness point of view, it is not profitable for the capitalist to re-use or re-cycle. It is cheaper to saw down more trees and make more paper cups and paper plates than to hire someone to wash china ware. The resources are there, though exploited and nothing stands between their destruction and subsequent disposal as wastes except for the occasional conservationist or ecologist who is horrified by the mess.

In China, where use replaces profit, the criteria are reversed. With ample labour, the Chinese find it necessary and economically profitable to convert wastes into usable products. They say little about aesthetic considerations, which, in any event, seem never to have played much of a role in world history.

The ethic of non-waste and the priority the Chinese have placed on use over profit have not been the only factors which have mitigated China's environmental problems. The very nature of their social organisation has helped them avoid industrial bottlenecks and the necessity for rapacious individual consumption instead of communal use. Beginning with their experience in the Kiangsi and Yenan Soviet areas, the Chinese Communists were forced to experiment with decentralisation in order to survive. A large unwieldy centralised government simply could not have functioned in the hills under constant Kuomintang attack. After 1949, experiments in decentralisation continued, partially because the Chinese leadership felt that it was the only practical way to manage a country so large and so disparate as China, but also because the Chinese again feared attack-this time by the US. As a result, they have made a tremendous effort to bridge the gap between the countryside and the city, between industry and agriculture, between the factory and the farm. Unlike most western countries which have heavily industrialised sectors centralised in certain areas (an easy target for an air strike), the Chinese have sought to decentralise many of the industrial functions upon which everyone, whether in the country or the city, is dependent.

Most communes have small industries attached—machine shops, bicycle factories, etc—and even small steel furnaces. The emphasis has clearly been placed on the self-sufficiency, or

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as the Chinese say, self-reliance of each community. There are many huge industrial complexes in China. But more often than not these have been built around a given resource such as steel, iron, or coal which must be mined and refined in the area in which it is located.

The effects of this decentralisation on the environment seem clear. Large multi-industrial urban areas have been discouraged, which has meant that massive pollution has not been consistently concentrated in small areas. With most communes being as selfsufficient as they are, the Chinese have also been able to avoid certain kinds of transportation bottlenecks which have led to heavy pollution in the west. Self-sufficiency on one hand, and discouragement of idle consumption on the other, have enabled the Chinese to use modest transport facilities and still carry all essential goods.

An article in the February 5, 1971 *Peking Review*, written by the Writing Group of the Tientsin Municipal Revolutionary Committee, speaks of "Wiping out the borders between different industries, (so that they can) develop along the road leading to integrated complexes." The article goes on:

"The process of production is one in which man knows, transforms and utilises nature. But nature's resources cannot be fully utilised by producing one product. In making one product, resources are partially transformed into this product and the rest becomes 'waste'. The question is how to look at this 'waste'from which point of view and with what attitude. From the metaphysical point of view waste cannot be used and should be got rid of. On the contrary, the materialist dialectical view holds that what is waste and what is not waste are relative terms. There is nothing in the world which is absolute waste. 'Waste' under one condition may be valuable under different ones. 'Waste material' left from one product can become good material for another product. After being transformed and utilised 'waste material' can become a product or a useful material."

**Basic solutions to basic problems** If the Chinese appear to have some solutions to impending world ecological disaster, it is not because they have sought to fine oil companies a paltry amount for each oil spill, not because they have slowly put better smog devices on private automobiles, not because good citizens save their no-deposit, no-return bottles and cans (which are hardly profitable for the companies to re-process even if they are brought gratis to their doors), and not because people are worried that China is becoming ugly. Their solutions are direct extensions of the revolutionary nature of their social organisation and value system. The environmental catastrophe which confronts western industrial societies (again, including the USSR and countries like Japan) will not be solved by minor adjustments at the top.

Basic problems require basic solutions. In this sense, the Chinese revolution teaches us little that we can apply to our own societies in the West to stem the deterioration of the environment. What it does teach us is that there is no solution to cleaning the air, the water, and saving open spaces, without basic revolutionary changes in the corporate society in which we live.

Believing as they do in communal use, the Chinese have been able to cut down on needless duplication in production. Not everyone in China has, or needs, a car. Each brigade, work team or commune has vehicles which are shared in common. Public transportation is excellent.





In this example of transportation, one can see how the Chinese system has had a double impact on the environment. Not only is there less vehicle smog, but there is much less destruction of water, air, and natural resources which in a capitalist nation would have come from manufacturing private automobiles which may be used as little as 10 per cent of the time.

Duplication of production for individual use has been almost completely avoided, except for personal or household necessities. Not every home has, or needs, its own clothes washer and drver. Radio and television broadcasts can be heard in communal areas. Farm tools and tractors are shared rather than owned individually, which obviates the necessity of every man owning his own. The list of examples is endless. The result is that the productive capacity of the country need not be as high per capita as in a capitalist country for the people to enjoy a healthy economy and a relatively high standard of living. The environmental impact of production being geared to a more limited and communally defined need is obvious. That is not to say that the Chinese have no environmental problems and that they live in an idyllic state of nature. The Chinese do have a very large population. But it is on a scale

which is still manageable and takes place in the context of a revolutionary socialist society which provides certain tools enabling the Chinese to act effectively.

### **Herculean efforts**

Chinese publications abound with endless examples of herculean group efforts. For instance, Peking Review recently ran an article discussing a project to clean up the Huang-pu and Su-chou Rivers. As a result of Shanghai's industrialisation and sewage system, the rivers have become badly polluted and choked with an organic mire. During the Cultural Revolution some 90,000 people were mobilised to dredge the rivers. During the course of 100 days, some 403,000 tons of mire were removed. In the US the story would probably have stopped here (if it were even possible to find 90,000 volunteers). But in China, the mire was carefully analysed, determined high in nutrients, and finally used as fertilisation on adjacent fields. Mass mobilisation allowed for cleaning up the river. The notion that waste should be used, not dumped, accounted for its being recycled as fertiliser.

Ta Kung Pao ran a short article on July 29, 1971 called Sewage Disposal Project:

"A ten-kilometre long sewage dis-

posal canal has been built in Changchun. It carries off sewage water which used to flow into the Yitung River which cuts across the city. The sewage water drains off to irrigate the farmland on the outskirts. This has helped improve the city's environmental sanitation and increase grain and vegetable output."

Now 52,000 tons of sewage water from the city's factories and living quarters drain off to irrigate 330 hectares of paddy fields and 1,200 hectares of other cropland. The people's communes, using sewage water which contains nitrogen and phosphorus to irrigate their farmland, save a total of about 3,500 tons of chemical fertiliser a year. The project also creates conditions for multiple use of sewage water.

Sewage is a valuable commodity for any agricultural community, if it is properly re-cycled for use. If it is not, it can also be a tremendous liability. Rich, as it is, in nitrogenous nutrients, it can cause unchecked growth of water plants and algae, thereby clogging streams and lakes, ruining valuable watersheds or fishing grounds. While the US is still installing primary or secondary treatment plants for sewage (treating sewage with chlorine and getting rid of it), the Chinese appear to be moving towards ecologically sound and financially rewarding tertiary treatment plants which seek to use both water and solids, disposing of nothing for the sake simply of disposal.

Doubtless the western hangups over viewing excreta as "valuable treasures" has somewhat conditioned our impulse simply to flush it away and be gratefully done with it. The message that "it is still there", whether in a river, lake, or ocean, does not appear to have been understood. The Chinese. on the other hand, do have a long tradition (once again, born of necessity) of composting and using their "night soil" as a fertiliser. In recent times this tradition has not only helped mitigate the problem of sewage disposal, but has also meant that less chemical fertilisers are needed. And although I have seen no references in the Chinese press to the deleterious effects of phosphates and other chemical fertilisers, we know their dangers from our own experience. The less used, the better the environment will

survive. In Industry as well, all are urged in China to make use of all byproducts and wastes. Articles are endlessly printed extolling "multi-purpose use". An article in the May 7, 1971 *Peking Review* read:

"Workers in Tientsin, an important North China industrial city, have had outstanding success in multipurpose use of industrial waste. According to preliminary statistics from 70 units, 190 fairly large items have been successfully experimented on for comprehensive utilisation... Workers in a sulphuric acid plant have tried out a new process which makes it possible to get steel from waste left in producing sulphuric acid. Many workers started multipurpose use of waste after studying Chairman Mao's philosophical thinking. They came to understand that 'all things invariably divide into two' and that, under given conditions, waste materials could be transformed into useful things and the harmful into the beneficial."

Medium- and small-scale industries have been encouraged to begin alongside larger industries which produce wastes in order to capitalise on them like beneficial parasites. The ideal is a combination of large, medium and small industries which co-exist to exploit the maximum yield of any given natural resource.

Another article in the November 10, 1970 issue of *Peking Review* explained:

"The revolutionary masses in light industry departments are making full use of industrial waste, including waste gas and liquid residue and all kinds of scrap . . . Kwangtung and Fukien Provinces produce no cotton and formerly relied on other provinces for cotton yarn and cloth. As a result of multi-purpose utilisation, they now manufacture artificial fibre pulp and other products from suger cane residue".

Clearly, the use of an accounting system which does not value individual profit (as in the west), or machine productivity (as in the Soviet Union), but the fullest use of a community's resources, is one of China's most significant advantages.





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# Is ecology elitist?

### by David Pearce

As the movements for environmental protection grow, cautionary voices are pointing to an alleged middle-class flavour in the campaign. Since it is widely suggested that economic growth and environmental quality are inconsistent objectives in the current context,

environmentalists are seen as the well-to-do who have already reaped the benefits of industrial growth and who can now afford to campaign for the protection of their personal havens against further change. To what extent is the accusation justified?

The onslaught began with Anthony Crosland's restatement of Labour policy towards growth. Speaking of "parts of the conservationist lobby", he asserts that "their approach is hostile to growth in principle and indifferent to the needs of ordinary people. It has a manifest class bias, and reflects a set of middle and upper class value judgements. Its champions are often kindly and dedicated people. But they are affluent and fundamentally, though of course not consciously, they want to kick the ladder down behind them."<sup>1</sup>

Echoing these comments, Professor Beckerman has declared that "I suspect that most of the people who are currently anti-growth are motivated by middle-class judgements, and that if this were more apparent they would not receive such uncritical support."<sup>2</sup>

Other examples are not difficult to find, and nowhere has the attack on

The author teaches at the Department of Economics, University of Southampton environmentalists become more heated than in the apparent inconsistency between, on the one hand, global environment controls and the development of the third world, and on the other hand, lower growth rates in advanced countries and the necessity for less developed countries to export in order to develop. In the former case we have as an example the debate initiated by Dr Borlaug over the desirability of a universal ban on DDT3; in the latter case we have the instance of the declared hostility to anti-growth by African representatives to the Stockholm Conference.4

Although the pro-growthmen gather strength daily, there is a remarkable paucity of response from environmentalists. Obviously, there is a charge to be answered. It would be tragic indeed if the environmental movement lost out in a debate that has become strangely one-sided. This short paper aims to distinguish between what is and what is not sound in the progrowth argument as far as it relates to class bias. If it goes some way to correcting the balance, so much the better.

### Growth and the distribution of benefits

In his highly cogent defence of economic growth, Professor Beckerman points out that growth brings benefits as well as costs. To look at the cost side alone is to paint too gloomy a picture. The appropriate criterion, he suggests, is to weigh up the benefits of growth against the costs, familiar enough to anyone acquainted with the rudiments of economic cost-benefit analysis.5 We should only aim to grow therefore if the extra benefits of so doing outweigh the extra costs. Moreover, growth is to the benefit of the less wealthy. Indeed, both Crosland and Beckerman see growth as the sole means of securing improvements in the lot of the working classes. Hence we can justify growth on two grounds: (a) the overall benefits tend to outweigh the costs, (b) growth will benefit the poor.

This argument deserves careful attention. As long as the demand for material wealth increases over time. either because each individual desires more wealth or because there are more people to demand that wealth, and as long as the extra costs of growth are positive but not infinite, growth can always be justified on cost-benefit grounds. The diagram (p. 63) illustrates the point. The idea of a demand curve is familiar to most people: in this case the demand curve shows the demand for total national output. The vertical axis is best thought of as showing the extra value placed on that output: the extra benefits in other words. The curve labelled "extra costs" suggests that more output necessarily means more environmental disamenity, possibly a contentious issue in itself but one that we accept for current purposes. What matters then is that we should try and secure the biggest level of net benefits. On the diagram, this means making the difference between the area under the extra benefits curve and the area under the extra costs curve as great as possible. This turns out to be where the curves intersect. So, for the first demand curve output level X<sub>1</sub> is the "best" level. Now, if the demand for output grows over time, the demand curve will move upwards to the right. Extra benefits accrue, as do extra costs. The new "best" level of output is X2. Inspection of the diagram shows that, as long as people desire growth, cost-benefit analysis can always be relied upon to justify it. This arises simply because the "extra cost" curve rises with a positive slope. Is the argument correct? Its basic failing is that it assumes we know what the "extra cost" curve

looks like. We do not. One would have thought that one of the major results of ecological research was to show that ecological consequences are frequently not known. If that is so, the proper context of inquiry is one of how to behave under uncertainty. More important, that context is not one where the usual adjustments for uncertainty can be made. If we make the wrong decision, the consequences might be irreversible, and no-one in economics has yet devised (nor, I would argue, could they devise) a method for putting a money value on irretrievably lost goods. To take the argument further, there is nothing in cost-benefit theory to suggest that the point where net benefits are maximised is consistent with ecological stability. If this is correct, economists are behaving in a strangely ostrich-like fashion in insisting that where net-benefits are maximised we are at some sort of "optimum". The idea that we can optimise in the economic sense but fail to secure the conditions necessary for survival is one that deserves to be entertained more readily by economists. To return to the class issue, what I am suggesting is that, far from the environmentalists diverting attention from crucial issues of urban improvement and bettering the lot of the working classes, the pro-growthmen are in serious danger of diverting attention away from the necessity to integrate economic and ecologic ideas, towards squabbles which may be decidedly fruitless if even the mildest of the pessimists are correct. It is also worth noting the other oddity of the argument, particularly as it is advanced by Crosland and Beckerman, both "orthodox" socialists. What used to be the main tenet of socialist theory-the redistribution of existing wealthseems largely to have disappeared from consideration. Hence the preoccupation with growth as the means of bettering the working man's material welfare. Apart from the highly questionable statement of fact that growth benefits poor more than rich, how far is it from the truth to suggest that what we are witnessing is a peculiar brand of middle-class socialism that has become embarrassed at the idea of redistribution? The argument is similar for underdeveloped countries. Here it is the growth of advanced economies that is seen as the impetus for growth in the third world, the former providing

markets for the latter. Redistribution is rarely mentioned. Anyway, there is a confusion in the pro-growth argument in this context. It is difficult to find environmentalists calling for *no* growth in underdeveloped countries. What they do ask for is that the *pattern* of growth is not made a replica of western industrialisation. The idea that growth policies should be integrated with ecological planning is not in any way detrimental to improvement in less developed countries. On the contrary, it is a prerequisite for their avoidance of our problems.

### The environment as a public good

Another strand of the class-bias argument relates to the idea that the environment can be seen as the provider of certain goods-amenity, clean air, water, and so on. In general, these goods have no markets-we do not trade clean air in the way we buy and sell apples. More than this, these goods have a peculiar aspect. If I "consume" clean air it doesn't affect vour consumption of it. We are both free to consume as much as we like without detracting from each other's enjoyment of it. On the other hand, if I eat the apple, you cannot have it. The economist contrasts these cases by calling the environmental good a "public" or "collective" good, and the apple a "private" good. In the same way of course, some aspects of environmental decay constitute the opposite of a public good-they are "public bads". Mercury in the environment promises to affect us all. Basically, those who suggest that environmental concern is class-biased, are saying that public goods tend to be demanded by high income groups more than by low income groups. But, by the definition of a public good, if it is provided to the rich it is provided to the poor and the poor will have to pay their share of the cost of providing it. This means that the poor will receive the public goods, and pay for them, even though they may prefer to have something else instead-more consumer durables or whatever. So, if the environment protection movement achieves more and more influence, we can expect, so the argument goes, this bias to increase. This is an elaborate and ingenious argument. Unfortunately, it reflects the curious way in which economists simplify the world in order to analyse it.

It assumes that the environment is some kind of homogeneous public good: all aspects of environmental protection are the same. But they are not. At the very least it is worth distinguishing global public goods and bads from other public goods. We know for example that DDT and mercury have proved to be indestructible and are distributed on a worldwide scale. To say that the rich have a greater interest than the poor in their control is to indulge in circular argument. DDT residues and mercury poisoning will either affect us all, or, more likely, will affect those populations who rely most heavily on foods which are likely to have the highest level of contamination. The rich can afford to refrain from eating contaminated fruit, but can the major fisheating nations of the world refrain from eating fish?

Similarly, Crosland complains that environmentalists care more for Mediterranean beauty spots than for the beach at Blackpool that his constituents have to tolerate. He wants everyone to be able to enjoy the Mediterranean, and rightly so. But it smacks of Humpty-Dumpty reasoning nonetheless: oil pollution has not proved to be a respecter of middle-class beaches and one wonders if Mr Crosland is aware of the pollution of Mediterranean beaches. If we fight oil pollution it is for the benefit of everyone.

But many environmental "bads". even if they are less important, do not fit the global bad category. Take air pollution as an example. Is clean air just for the benefit of the rich man? The very opposite is more likely to be true, and several studies have already borne this out. One US study of Kansas City, St. Louis and Washington showed very clearly that exposure to suspended particulates and SOx in creased as the income levels of those affected decreased. The same is true of noise exposure. Another study at Buffalo showed that eczema and asthma in children had a higher incidence in areas with higher air pollution levels. These levels were in turn inversely correlated with social class grouping. How does all this square with the charge that environmental concern is a middle-class fetish?

Basically what happens in the above cases is that the rich can afford to adjust to the existence of localised public bads like pollution. They simply buy their way out into the relatively clean air of exurbia. But if this is true, they can have little interest in cleaning up the atmospheres of cities. To define the environment movement in such a way as to exclude concern for the urban environment, as Anthony Crosland tends to do, is to play the game of arbitrarily defining your friends so that they become your enemy. It is easy to see how the misconstruction has arisen. Think of an environmentalist, and if you have played no real part in the movement, the picture that comes to mind is of a weekend pondclearer, osprey protector and dogwood destroyer. He or she does tend to be middle-class, although they indulge in costless leisure activities that only do good. Think of the average public inquiry, and the middle-classes appear as the protestors. Of course there are protectors of rivers who worry only for the preservation of expensive fishing rights. Of course there are yachting interests who worry about noxious sewage. But, with the false picture firmly implanted in their minds, the next step is to confuse the complainers with those who suffer. That the middle classes tend to be more articulate and more aware of the channels of communication and protest hardly constitutes a justification for the blanket charge that all environmentalists have a personal, vested interest in the environment, not shared by the less articulate and less wealthy.

The final cause for sadness must be



that the protagonists of the "classbias" theory should really be allies. The aims of planning for quality rather than quantity are common to good socialism and good conservation. It is to be regretted that Mr Crosland and his followers have chosen to snipe from the wings at a platoon they have confused for the army.

#### References

- 1. Crosland Anthony, Jan. 1971 A Social Democratic Britain Fabian tract 404
- 2. Beckerman W. 1971 "The Desirability of Economic Growth" in N. Kaldor (ed), Conflicts in Policy Objectives.
- 3. See the discussion in Michael Allaby's article, "Why not Ban DTT?" in the *Ecologist*, April 1972
- 4. For a curious outburst against environmental concern in this context see Michael Lipton. "Copperplating One's Navel" Bulletin of the Institute of Development Studies, Sussex University, December 1971. Its curious aspect arises because of the author's apparent certitude that there is no problem. This would be an acceptable basis for argument if Mr. Lipton showed something other than a less than nodding acquaintance with the arguments.
- 5. See my Cost-Benefit Analysis, (Macmillan, 1971)

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### Things that go pump in the night ...

### The secrets of Snowdonia by Graham Searle

One of the loveliest parts of Snowdonia is to be torn apart and drowned by the Central Electricity Generating Board so that it can build a pumped storage scheme. This method of supplying peaks in demand is so inefficient that it will result in a net loss of electricity-quite apart from the loss of tourism and the loss of yet another of the earth's wild places. There is so little justification for the scheme that it is not surprising the CEGB has kept almost indecently quiet about the accidents on site.

Two thousand feet up, under the terminal crags of Elidir Fawr, sits Marchlyn Mawr, a natural lake bounded by the steep walls of a classical armchair cwm.

Until quite recently there were no more than a couple of paths leading from the village of Deniolen up the mountainside to a point from which on a clear day one can see right across Anglesey and beyond. The only reminder at Marchlyn Mawr that others had been there before was the small stone-wall dam restricting the outflow from the lake, but allowing it to discharge over the top into its natural water-course, the Afon Marchlyn Mawr. And yet, incredibly, this unspoilt lake is the largest reservoir operated by the Eryri Water Board.

On the cwm's south-east face is a unique climbing feature in this haven for British climbers—the Pillar of Elidir. It reaches up to become what the *Climbers' Guidebook* describes as "the most isolated peak in Wales". It is wild, wind-swept, and magnificent. But while, for the present, the

Graham Searle is Director of Friends of the Earth.

physical nature of the area can still be appreciated, peace and solitude have deserted it to be replaced by a roar which bodes ill for this rough little corner of the Snowdonia National Park. Now, a mess of incongruous tracks and roads criss-cross their way up to Marchlyn Mawr-carrying rigs and pipes, Irishmen and Geordiesand bringing with them the whine and splutter of the drills. Marchlyn Mawr is where the Central Electricity Generating Board want to put the upper reservoir of a new pumped-storage scheme. To do so requires the construction of a hundred-foot dam across the morainic lip of the cwm. The drills are already seeking bedrock.

#### Keeping quiet about the accidents

It is not easy work for the drill teams, and the CEGB cannot be pleased with the rate at which the work is proceeding, nor indeed about the equipment which has been lost both in high winds and amongst the alternating hard and soft rocks of the shattered moraine. But no one makes any fuss-or if they do, no one hears about it-even when lives are lost. Early in November a man was crushed to death beneath his upturned tractor whilst trying to pull a rig-carrying vehicle out of the bog, and there wasn't even a mention of it on local radio. The CEGB have had quite enough criticism to be going on with; they hardly want to attract more.

To the north of Marchlyn Mawr, Carnedd y Filiast marks the beginning of a great sickle-shaped amphitheatre of mountain peaks running round the lake then south and east, over Glyder Fawr at 3,279 feet and north again to Tryfan. This great, rugged mountain range presides majestically over the two famous passes—Nant Francon to the north and Llanberis to the south. It is down in the Llanberis pass that the CEGB want the bottom reservoir.

If the whole area is a haven for



Rig-carrier sinking in the bog

climbers, the pass at Llanberis is the Mecca of climbers and walkers alike. A chink in the mountain wall, it is one of the most important routes into Snowdonia's heartland, and contains down in its valley the twin lakes of Padarn and Peris. These silver fish-like bodies of water, only 400 yards apart and connected by the swift-flowing Afon Bala, can be seen from the Glyders to the Eliders, from Crib Goch to Snowdon, from the Pyg track and the cliffs of the pass. And there in their midst, guarding the valley, is the mound and castle of Dolbadarn standing alone-the only castle in the wilds of Snowdon, As W. G. Bradley wrote over seventy years ago, "There is no other Medieval fortress in the heart of these mountains. Every native king and chieftain who stood at bay must have had this one as his rallying point". But the reflective beauty of the lakes and the stark grandeur of the old tower which has withstood the fists of so many foes will not survive the hand extended to them by the Electricity Board. For the CEGB want to help Llyn Peris grow bigger and-if only one could see over reinforced concrete walls-make the scene grander still.

The plan for the bottom reservoir involves the construction of dams up to 40 feet in height across both ends of Llyn Peris. Each dam will be about 1,000 feet long. They will destroy views of the lakes from all directions, and will dwarf Dolbadarn castle, once the most commanding—and congruous of the valley's man-made features.

Pumped-storage schemes provide a means of using electricity to pump water uphill (converting electrical into potential energy and energy which is lost as heat) in order later for the water to flow back downhill (when potential energy will be converted into electrical energy with more losses).

64

Currently, electricity generating stations provide a more or less constant supply of electricity for domestic and industrial use at all times of the day and night. Electrical output from the plants can be varied but the shutdown and start-up periods required are relatively long. While supply is constant, demand shows definite and usually predictable daily fluctuations. In order to meet peak period electricity demand, supply must be increased, and when there is a downward curve in demand there is a surfeit of electricity available.

So the CEGB has adopted the method of using electricity in off-peak periods to pump water uphill from a lower to a higher reservoir, in order (in peak periods) for the water to flow back down and drive turbines which feed electricity into the grid. In this way the pattern of supply can be made more closely to approximate to that of "need". Thus the process demands a slow draw-down of water in the lower reservoir accompanied by a slow filling of the upper one, this being followed by a rapid emptying of the upper and rapid build-up in the lower reservoir. Levels will fluctuate constantly as water, mud, and fish remains are shunted up and down.

The passage of water between the lakes will be via an underground water tunnel which will run through turbines forming part of a power station to be built in disused quarries north of Llyn Peris. Needless to say there is no chance of the brown trout and char of the two lakes surviving the project. Nor is there any chance of saving shoreline flora and fauna, so great and rapid will be the artificial tides.

Indeed with the flooding of the lower lake, part of an old quarry's tailings will be submerged, and leaching of metal salts, oil from the turbines, and increasing turbidity due to disturbance of the waters will combine to make the upper lake, Marchlyn Mawr, unutilisable for domestic water supply. Replacement of this most important water-source will inevitably lead to damming and reservoir construction in neighbouring valleys.

There are a number of other problems associated with the enlargement of Llyn Peris to which, characteristically, the CEGB has provided engineers' answers. The road running along the south of the lake will be

liable to flooding. Answer: move the road up the mountain a bit. The Afon Nant Peris which currently flows into the lake won't be able to when the lake is dammed. Answer: move the river sideways a bit. Channel it through the mountain in a 98-foot diameter tunnel to bypass Llyn Peris and make it flow directly into the lower Llyn Padarn. And for good measure build a new bridge at Pen Llyn and a new road round Llanberis -and of course access roads up the wild mountainside to Marchlyn Mawr. to the surge shaft half-way between the top and bottom lakes, and to the new power station. Finally, in case there is a single person still unaware that the area has undergone some modification, focus attention with a well-sited string of cable-carrying pylons stretching from Dinorwic northwards and west beneath Moel Rhiwen and Moel y Ci to the Pentir substation four miles away.

### Before we say goodbye

But before we say goodbye to a couple of beautiful lakes, to an important water source, to the pre-eminence of an ancient tower, to another unspoilt mountainside, to fish, to dozens of incredible views down into the pass and across the mountains, we should count whatever blessings are about to be bestowed, and attempt to recognise any advantages in the trade-off.

Certainly the engineering works will detract from the beauty (and the tourist catchment) of the area, but will they provide employment in a part of Britain which needs it, and are these sorts of development the best way of doing so? Some local people will doubtless be employed, but while this argument alone always used to be enough to carry the day with Welsh planners and councillors, the signs are that it won't be for much longer. A younger, more critical, and more astute breed of Welsh politician is increasingly making its voice heard.

Daffyd Ellis Thomas, Policy Director of Plaid Cymru, has recently commissioned research into ways in which stable, long-term, and beneficial employment can be brought back to the people of the valleys of North Wales not by attracting to the region more and more short-term civil engineering projects, but by using existing governmental machinery to obtain grants for



Upturned tractor at Marchlyn Mawr

large-scale clearing up of the many sites of dereliction scattered throughout Snowdonia, the legacy of earlier industrial vandalism.

The concept itself and the scale on which it is envisaged throw down the gauntlet to a Government which purports to care not only about Britain's landscape heritage but also about regional unemployment and depopulation. If there existed just a modicum of political will the Government would inject the necessary capital into more ambitious clean-up schemes and improve both landscape and the employment situation, at a stroke. After all, we seem to be able to find plenty of money for more hazardous and more damaging enterprises which employ comparatively small numbers of people and for shorter periods.

Meanwhile the CEGB project goes ahead at Dinorwic, fought vigorously at every stage by the Llanberis and the North Wales Protection Societies. So inefficient is the pumped-storage method that at least a quarter of all the energy used to pump the water up to Marchlyn Mawr will be wasted. The whole operation will result in a net loss of electricity.

Is it really all a mistake? When Ginger Cain, the Llanberis Protection Society organiser, asked the man from the CEGB why the dams and roads had to be built, the man replied that such undertakings have "great value in helping to meet sudden increases in demand which occur at the end of popular television programmes when millions of viewers simultaneously switch on electric kettles". An honest reply, that. Like everything else, it's just a question of priorities.

### Down to earth

### Rat-a-tat-tat, open up, it's VAT !

It is because we are a country where people and their opinions matter that we have about 1,450 societies for this and that (not counting the 385 bodies concerned with pollution and the environment formed in the last three years), nearly 4,000 charities, about 100 employers federations and over 600 Trade's Unions and professional bodies. These have been able to rely on the freedom of the press that was the lifeblood of democracy-the right to read news and opinions unpopular with your Government-to have their views reported and their existence defended. It is possible in the USSR to criticise chipped cups in the refreshment room on Volgagrad station as "uncultured" but not oil pollution in the Caspian Sea. We can criticise and our criticisms matter.

For many months we have been seeing costly and cryptic advertisements in our newspapers with the blind eye that switches off print more easily than TV commercials. We have no shares in P & O, so do not care if VAT takes them over or not. If we are running small shops or businesses, however, we have suffered a pay cut, not a freeze, for we are working unpaid overtime in attending courses and wrestling with the many badlv written booklets that explain Value Added Tax.

This was designed not for a Nation of Shopkeepers, but of Tax Evaders. A Customs officer has only to satisfy a JP that there is "reasonable ground for suspecting that an offence has been or is about to be committed, or there is evidence that an offence is to be found there" to secure a search warrant that will allow him to enter any premises, including private houses, at any hour of the day or night, inspect records and goods, search the premises and anyone found there, and remove anything relevant. In certain circumstances, a person shall be guilty of an offence "whether or not particulars of that offence are known".

For SET and Purchase Tax, entry to business premises is restricted to "reasonable times" or normal office hours. VAT brings to Britain the midnight knock on the door, the gutted office and the papers removed, leaving the suspect to prove his innocence. The normal man today is indifferent to what happens to small shopkeepers. on whom his wife is asked to spy by advertisements that assume traders will take unofficial action in defence of the law. No advertisement, however, warns the private citizen that he can be guilty of offences against the VAT Act, though ignorance of the Law is no defence.

If you are Honorary Secretary of Angling Club, collecting over an £5,000 a year in subscriptions which pay for renting and stocking gravel pit lakes, you are liable for 10 per cent VAT on these subscriptions, even unpaid ones, and your books and records must be kept to conform with VAT requirements. Whatever your organisation, write to your local Customs and Excise office and register, for if your total turnover, including sales to members or non-members, but not donations, is over that £5,000 a year, you are liable, and must keep records just like a small shopkeeper. The exceptions are Trades Unions, professional bodies and Political Parties.

If you are running a Charity, say a home for the dying, and though you are mainly supported by donations, you have members who covenant a regular sum each year and receive a quarterly newsletter with chatty accounts of which nurses married which doctors and the progress of the new wing then you are "giving value" to members, and are liable to 10 per cent VAT on their subscriptions, but not on the Tax refunds. Jumble Sales. Whist Drives, Entertainments, Oxfam shops and all the activities that support Charities or Societies must all pay

VAT. Coconut shies at a Conservative (or Labour or Liberal) fete are free, but taxed 10 per cent if they are for St. Dunstans. You may sell flags for the Electricity Workers strike fund in a power cut tax-free, but not in aid of the Lifeboatmen.

Write and register, whatever your Charity, but write also to The National Council for Social Service, 25 Bedford Square, London WC1. Though Charities cannot campaign to change the Law (which is why they are so badly treated by politicians), this body is doing what it can to bring this tax in line with the Six. Belgium does not tax non-profit making bodies, or the goods they sell to members, France and Holland tax the goods, but not subscriptions, and Italy is a "don't know" for they have still not imposed VAT. All however enforce the most iniquitous part of the tax-the 10 per cent on research fees.

We have many "sufferers' societies", for Asthma, Arthritis, Multiple Sclerosis—you name it, those who have got it are paying an annual subscription (taxed at 10 per cent) and receive a periodical with popular accounts of research in progress, advice and news. Some of their funds pay for this research, and if this is done by a commercial laboratory with a turnover above £5,000 a year, this must charge 10 per cent VAT. If *donations* are spent, this is taxed once, money gathered by subscriptions is taxed *twice*.

Large bodies like the Imperial Cancer Fund have their own laboratories and research staff, and pay no VAT, just like ICI or other firms with research departments. Small charities like the Schizophrenia Society (which recently measured the traces of copper in patients' hair as an aid to diagnosis), will pay, just like small firms, inventors or pollution societies whose £50 'per sample for measuring mercury becomes £55 in April.

Public figures, TV personalities and MPs raised a mighty outcry at the admission charges for art galleries and museums. Yet the sum and the principles involved are trifling compared with the tax on research and on Charities that no Chancellor would have dared put in his Budget. Have we only courage enough to protest at the chipped cups of society and not at the pollution of the quality of life?





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### Demo-technology

### Alternative heating trial nears completion

A great deal of interest has been aroused in the technical and trade press over the past ten years by a unique school at Wallasey, Cheshire, heated by electric light bulbs, the occupants' bodies and the sun. Very little of this interest has filtered through to the consumer press, but with problems of energy becoming more urgent, the story of St George's School, and its forwardlooking architect, deserves attention.

The Annexe at St George's School was the brainchild of Mr Elmsley Morgan, who until his death in 1966, was the borough architect. Opened in 1962, the Annexe became a practical development of a patent<sup>1</sup> he submitted the previous year. Although the corporation had sufficient faith in his ability to allow the building to proceed, they were pessimistic enough to order, at a cost of £5,000, full central heating to be installed. Apart from one occasion during the power strike last winter (when it was turned on to see if it still worked), no artificial heating has ever been used during its occupancy.

The Annexe consists of an assembly hall at the west end, together with certain utility rooms. Then follow, at ground level, five conventional classrooms. At the east end are the workshops and boys' gymnasium, but these are housed in a separate building with a different orientation from the main portion. A corridor runs the full length of the building along the north wall on the ground floor.

Since its inception, research studies have been carried out by the Department of Building Science, University of Liverpool. In order to arrive at representative thermal parameters for the building, a central length of 116.5 feet in the structure was selected, and fully instrumented. This section consists of four of the ground floor classrooms together with the corresponding upstairs rooms, an artroom, science laboratory and two further classrooms. The specimen length contained two staircases, a staff room and several store rooms. The upstairs rooms occupy the full depth of the building, about 38 feet.

Structurally, the ground floor consists of 4in of screed upon 6in of concrete. The intermediate floor is of concrete, 9in thick, and the roof consists of a 7in concrete slab, with a layer of 5in of expanded polystyrene above it, suitably protected. This latter feature, in itself, was virtually unheard of at the time, and this "upside down" technique (conventional roofing has the insulation below the concrete) has recently been promoted as a "new" method for flat roof construction.

Partition walls are constructed of 9in plastered brickwork. On the north side, at first floor level, the external walls are also of 9in brick, with a 5in polystyrene external cladding. At ground floor level, the external wall is partly ranch cladding, and partly solar wall similar to the south side.

Occupying the entire south facing wall, the main solar screen wall is 230 feet long by 27 feet high. For the most part, it is double glazed diffusing glass (opaque), with a 24in separation between the leaves. Each classroom is provided with two or three opening windows, with single glazing.

The interim report of the technical results obtained in the Annexe<sup>2</sup> will be of particular interest to architects and environmental engineers.

In a survey<sup>3</sup> conducted by Ann D. M. Davies of the Department of Psychology at The University of Liverpool, comparative research has been carried out to establish the different effects, on both pupils and teachers, of conditions in the main school and the Annexe.

The outstanding problem would seem to be finding a practical way to maintain a constant temperature in the Annexe, without resulting in stuffiness or "odour laden" air.

Overheating occurs in summer, compensated for by opening the windows to obtain a circulation of air. However, as one teacher put it "I tend to spend a lot of time opening and closing windows to keep the rooms at an even temperature". The architect intended that the staff should adjust their environment through the use of windows and ventilators, but if the survey is any indication, it would mean that teachers would spend more time trying to maintain a constant environment than actually teaching.

The verdicts of staff and children of St George's School are in accord: as a teaching environment, the Annexe is not conspicuously better or worse than the adjacent Main School. The corridor however is gloomy and the solar wall obscures a fine view.

With the present design, an equable temperature, a quiet room and pure air cannot be enjoyed simultaneously in all seasons. In winter, the warm, stable temperature of the Annexe is generally recognised and appreciated, but the price paid is an odour-laden atmosphere. In hot sunny weather, a choice has to be made between noise and heat.

"The more massive a building is, the lower the peak temperatures reached during prolonged periods of sunny weather and the fewer complaints from the users"4. The Annexe is a very massive building and the architect stressed the importance of leaving both ventilators and solar wall panels open, "especially at night to take away the heat stored in the heat-storing fabric during the previous daytime". It happens, however, that although the openable windows in the solar wall can be secured closed by a simple movement of a clasp, they can be secured open only by use of a special key.

The final report on the feasibility of this type of construction will be published shortly and it would be impudence on my part to anticipate its conclusions. However, as an experiment in alternative forms of heating, the school would seem a success, its deficiencies in environmental control being the big question mark.

Arthur Puffet

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### Towards a unified science

### Subjective classifications and their definitions

Processes occurring at a relatively low level of complexity, i.e. at the atomic, molecular, or cellular stage, lie to a large extent outside our immediate experience, and are therefore less subject to subjective thinking. However, as soon as we leave this level, and especially when we attain that of the human being and the societies into which he is organised, we gradually find ourselves heirs to a plethora of subjective concepts, in terms of which we have been taught to think since childhood—such as "mind", "consciousness", "memory", etc.

Even when we admit the desirability, for scientific purposes, of adopting teleonomic classifications, we are loath to abandon such subjective terms. So well established are they in the society we live in and so firmly engrained in our minds that we tend to regard them, unconsciously at least, as real constituents of the environment. Rather than be forced to admit that we are guilty of subjectivity and nominal realism (the fallacy of regarding words as real constituents of the environment like the things they represent) there is a tendency to avoid defining such terms altogether. In some cases, we even persuade ourselves that a definition is not required. Such terms as "life" and "culture", for instance, have never, to my knowledge, been adequately defined. This, however, has not prevented innumerable academics from devoting their lives to the study of these subjects, and accumulating vast amounts of "empirical" data on them.

Let us take the term "life". George Wald, a Nobel prize-winning biologist, observes that no one has defined it.

"A curious thing about biology is that it flourishes as a science of life without attempting to define life. We are often told that the beginning step in any science is to define its terms, indeed, to give them operational definitions, by which one usually means to describe the operations by which they can be measured".

"Biologists long ago became con-

vinced that it is not useful to define life. The trouble with any such definition is that one can always construct a model that satisfies the definition, yet clearly it is not alive.... And, of course, we do not measure life. We can measure many of its manifestations accurately; and we combine those with others that we observe, but perhaps cannot measure, to make up our concept of what it means to be alive. The life itself is neither observed nor measured. It is a summary of and judgement upon our measurements and observations. What biologists do about life is to recognise it. ...."

Contrary to Wald, I maintain that all precise terms must be definable if they are to be used for the purposes of building an effective model.

When I say "definable", I am referring to teleonomic definition, i.e. to the role of a variable in a given model.

The term "life" is applicable to systems at a particular level of complexity, usually associated with the development of a cell, though this is by no means a clear delimitation, since precellular anergisms such as bacteria fall within the field of biology.

The discovery of the virus caused a shift in the exact field of biology, since these "independent genes", having a still simpler organisation than the bacteria, manifest certain characteristics of living things when in a vegetative stage, though when deprived of a source of protein seem little more than crystallised nucleic acids.

My contention is that such systems cannot be classified as living or nonliving things because "life" has not been defined, and no satisfactory definition of "life" is available, because it does not constitute a scientific classification.

Rather than refer to the role played by a particular situation or process in a larger one, as is the case with the classification "level of complexity", for instance, the classification "life" corresponds rather to the way things appear to us. It is a subjective classification rather than a teleonomic one.

George Wald's article provides us with another example of this:

"Once, years ago, I was asked to attend a conference entitled 'Fatigue in the reading of microfilm'. One paper defined fatigue as deterioration in performance. He then described giving experimental subjects a battery of about a dozen different tests of performance, then keeping them awake for two or three days and re-testing them. None showed any demonstrable deterioration in performance. The psychologist kept assuring us that nevertheless he was certain that these persons were fatigued.

"I learned then that this familiar concept, fatigue, cannot be adequately defined. The most rigorous operation for determining fatigue seems to be to ask a person whether he feels tired."

The trouble with this treatment of the term "fatigue" is that it is being used in two different senses. To define fatigue as "diminished ability" appears to be a legitimate scientific definition that can be measured. Personally, I should prefer a slightly narrower definition in terms of diminished ability due to over-use of a particular faculty. Thus a curve could be drawn for most of our behavioural mechanisms, showing that up to a certain point the more they are made use of, the more highly will they develop. A point, however, will be reached when "fatigue will set in". At this point, the mechanism is being used beyond its normal possibilities, and performance, which until now has slowly increased with use, will begin to deteriorate. However, the only argument that Wald could furnish against such a teleonomic definition of "fatigue" was that people showing such diminished ability did not actually "feel fatigued", i.e. the teleonomic use of the term did not correspond to its subjective use.

It must be clear that two different concepts are involved. The first is of definite scientific value; the second, the subjective one, is of doubtful value. What a man says he feels, any psychologist will tell us, is not a reliable guide to his physical state.

Whenever a currently-used term appears difficult to define, it is well worth considering the possibility that it does not constitute a teleonomic classification, but merely a subjective one and that it is of no use for building an effective model, i.e. for truly scientific purposes.

Edward Goldsmith

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### The Biology of Pollution

KENNETH MELLANBY

Dr. Mellanby, an acknowledged expert on the problems of pollution, writes as a biologist, stressing the effects of pollution on living organisms. The mass communications media offers so much conflicting propaganda that he believes that this is the only way to appreciate the real influence on the environment of pollution in all its various forms.

The concept of pollution is first clearly explained. Major areas susceptible to pollution-the atmosphere, fresh water, the sea-together with the two most important agents of pollution, radiation and pesticides are discussed in detail. Within each chapter the expression of the respective pollutions and how they occur are described, and throughout the book suggestions for alleviating their impact on the environment are made. An important and extremely welcome inclusion is the appendix which outlines a variety of practical experiments that can be performed by students individually or under supervision.

- Edward Arnold

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70

### Friends of the Earth

Regular newsletter readers will by now be well acquainted with the organisation and campaigns of British FOE Ltd. Less well publicised has been the progress of foreign FOE groups. Since much is happening on the international scene this issue is devoted to FOEs abroad.

In Europe there are working groups in Amsterdam, Düsseldorf, Frankfurt, Paris, Stockholm and Zürich. Negotiations are in hand to start groups in Brussels, Copenhagen and Zagreb, whilst in Athens, Barcelona, Naples and Rome FOE has efficient and much valued correspondents. In Oslo FOE is affiliated to SNM whose title, when translated, stands for "The Working Party for Norway's Environment". There are moves afoot within the Norwegian organisation to make it a full FOE group at their next AGM.

Further afield there are of course the numerous state groups of the parent FOE Inc. Japan has an affiliate group based in Tokyo and there is even a promising nucleus of correspondents in the Peoples' Republic of China. No one imagines there will ever be Chinese groups patterned on those, say, in Britain. But even if FOE manages no more than the setting up of channels for low grade information, the exercise will have been worthwhile; someone has to start the dialogue. At the time of writing (14.12.72) negotiations are in hand to set up a group in Nairobi. By the end of the week we should know if FOE has its first African base.

In recognition of its achievements and now truly international character. FOE was recently accorded a signal honour. At the behest of the Economic and Social Council of the United Nations every national group of FOE is now accredited to the UN as Non-Governmental Organisation a (NGO). As a result, member groups now have the right to submit documents to the UN for their consideration and also attend UN sponsored conferences as observers. Mindful of the amount of paperwork to be got through, the UN does not give away this sort of privilege lightly. To date

FOE is the only political activist environmental organisation in the world to have been granted NGO status.

All groups share the same philosophy and are pledged to work for the redress of environmental abuse and the enactment of environmentally sound legislation. However, as circumstances vary widely from one country to the next. FOE tactics have to be adapted to suit local situations. In France, for instance, not only are press and television tightly controlled -making free discussion of controversial issues difficult-but the attitude of the French police is that anything which is not specifically permitted must be prohibited. This makes things difficult for a French pressure group which may want to demonstrate. One of the first campaigns of Les Amis de la Terre was directed against traffic conditions in Paris. Their method was the timehonoured "bike-in". Cyclists, it would appear, are not "permitted" and Les Amis were greeted by a brigade of club-swinging Parisian cops. Bodies were bruised, bikes were bent and several Amis are now awaiting trial for creating a disturbance. Round one les flics. More cunning to was obviously needed and Les Amis showed they could learn fast. Their next demonstration was directed at government agricultural policy and for this Les Amis made friends with some shepherds. Have you ever contemplated arresting a sheep? This was a matter to which the Parisian police were forced to devote some considerable thought. Actually, there were several hundred sheep, all grazing at the foot of the Eiffel Tower. Once again batons flailed, but to no avail. How do you brain a wildly scampering woolly object? Under a barrage of derisive jeers the police retired in confusion. On a more sober plane, Les Amis have published broadsheets on the traffic situation in Paris, which have brought forth a considerable measure of public support. Elsewhere in France Les Amis are seeking to protect from development Les Calanques, the unique limestone forma-

tions on the coast between Marseilles and Toulon. Also giving them cause for concern are the French nuclear tests next summer and the proposed lightwater nuclear reactor scheme at Fessenheim in Alsace.

In Germany FOE members are widely distributed but the main centres are in Düsseldorf and Frankfurt. One of the problems of Freunde Der Erde has been getting their points across to a reactionary press. So far they have met with little success. Instead die Freunde have resorted to a brilliant poster campaign exposing the business interests of German ministers and indicting firms which disregard safety precautions when disposing of toxic wastes like cyanide and heavy metals.

As in France, the German authorities acted swiftly to prevent "unpopular" issues from being aired in public. Police moved into rip down the posters. Die Freunde responded by sticking their posters on glass bus shelters with hard setting glue. Each poster takes half an hour of hard scraping to remove . . . and there are thousands of them. Like their French colleagues die Freunde are also worried about plans for building lightwater reactors.

Urban planning, transport policy, forestry and the status of the Lapp minority are some of the concerns of Jordens Vänner in Sweden. Skilfully directed by C. E. Lennart Daleus, Jordens Vänner have become a national clearing house for environmental information, widely respected and increasingly influential.

Jordens Vänner also played a key role in the publication of the daily Stockholm Conference Eco. The result of a remarkable co-ordination of efforts between staffs from the Ecologist, Not Man Apart, Your Environment and international FOEs, this unofficial newspaper scooped the news of the Chinese declaration at the end of the Conference two days before any other paper in the world. Overnight it sold seven thousand copies and became required reading for anyone who wanted to consider themselves well informed. Wherever there is an international conference that matters, and whenever the truth needs an airing, the Eco will appear.

Colin Blythe

### Books

#### Use and abuse

SOCIAL BEHAVIOUR, NATURAL RESOURCES AND THE ENVIR-ONMENT, by William R. Burch, Jr., Neil H. Creek, Jr., Lee Taylor. Harper and Row, £2.35.

THE DEATH AND LIFE OF GREAT AMERICAN CITIES, by Jane Jacobs. Penguin Books, 75p.

The editor of the first of these books, a collection of papers by American academic sociologists, complains that the contribution of sociologists to the resources and environment debate is not fully recognised. Having ploughed painfully through the whole book looking for a glimmer of relevance one can only comment that the yawning indifference of the public to sociology, as here manifested, is totally justified.

The study technique seems to be to take an area of study, give it an eyecatching title, distill all reference to real human concerns from it and then do elaborate statistical correlations. One example must suffice. It is a paper entitled "Variations in Patterns of Leisure Behaviour: An Analysis of Sociological Aggregates". The words of the author himself best convey the flavour of the piece.

"In new areas of inquiry where theory is emergent and speculative, a search for empirical regularities often provides a heuristic beginning for more refined and sophisticated analysis. In this paper we will examine the phenomenon of going to parks." But before our intrepid investigator can get going on this there is a huge difficulty. "The definition of a park in sociological terms is still in the process of development." Pending the result of this research a daring assumption had to be made and tested. "For this study the respondent's own definition was employed. It was assumed that sufficient consensus exists within a culture so that adults could respond to the stimulus 'park' and distinguish it from 'non-park'. No difficulty in this respect was experienced."

Fourteen pages later we arrive at the conclusions:

- "1. nearly all adults go to parks at some time.
- not all adults go to parks with the same frequency or recency.
- such differences in going to parks appear to be associated with similarities and differences among adults with respect to social class, education, social age and residence."

This is utter nonsense. However, it is the worst paper in the book; the rest merely waver between the trite and the banal, with one exception. This is an informed and passionate attack on the mindless destruction of the culture and livelihood of the Spanish American farming communities of New Mexico by the provision of federal "aid" in the form of dams and irrigation schemes. In this paper there is a concern about realities which highlights the intellectual vacuity and irrelevance of the rest.

Perhaps, however, one is being unfair. The pursuit by these gentlemen of the elusive definitions of parks and other things is, like croquet, a gentle and harmless occupation. They could be up to much worse.

Jane Jacobs' book is a classic. It was published 10 years ago at about the same time as we were basking in the euphoria of Buchanan's *Traffic in Towns*. Now we can see who was right and who was wrong.

The whole orthodoxy of planning slum clearance, traffic management, highway construction, comprehensive development, zoning—is analysed and shown for what it is. The antiseptic Garden City ethos of Ebenezer Howard and the utopian fantasies of Corbusier have permeated town planning to such an extent that, as a profession, its contribution to human welfare is almost entirely negative.

Anyone who does not believe this sweeping generalisation should read this book. Anyone involved in amenity affairs, local politics or concerned with the quality of urban life should also do so. It does not contain the whole truth, nor does it pretend to, but as we head deeper in crisis in all the great cities of the world we need the brightest lights to find any way for ourselves at all. Jane Jacobs supplies a particularly bright one.

Perhaps there is a lesson for the authors of the other book in the chapter on city parks. She worries not about their sociological definition but about their uses and abuses.

Gerald Foley.

#### Lands and problems

THE DESERT LOCUST by Stanley Baron. Eyre Methuen, £3.50.

LAND USE, An Introduction to Proprietary Land Use Analysis by D. R. Denman and Sylvio Prodano. George Allen & Unwin, £4.00.

The heavy use of modern insecticides in the industrial countries has created problems at least as severe as those it was meant to solve. In the developing countries insecticide use is more spasmodic but there are areas that are sprayed as heavily as any in Europe or America. The heavy armour of light aircraft, hand dusters and sprayers and on at least one occasion the US Air Force, diverted temporarily from Vietnam, that is used in the war against the locust would alarm most farmers. Yet no one can deny the reality and the urgency of the problem. The devastation caused by locust plagues has haunted the history of the Near East and North Africa from the beginning of time.

Should we accept, then, that this is one situation in which insecticides must be used in this way? Do desperate crises justify desperate remedies? At present the only weapons that are effective are dieldrin, gamma-BHC and dichlorvos, but for how long will they remain effective? The locust has not yet acquired resistance to them, but it may do so. Meanwhile the effects on the fragile ecology of the desert are unpredictable.

Stanley Baron is a journalist who became involved in the campaign against the desert locust (Schistocerca gregaria) and spent several years studying it at first hand. He describes the strategy used to control what might have been a major plague in 1967–68 as well as those used in previous outbreaks. He outlines the position of the locust in history and folklore and he recounts in some detail the field research that led to our present knowledge of the insect's biology and ecology.

Considering the position it occupies as Insect Enemy Number One it is surprising at first that so little was known about it until the middle of this century, but as we discover more about the strange ways in which it has adapted to its hostile environment the mystery is explained. Schistocerca exists in two phases, the solitary and the gregarious. When the solitary insect becomes gregarious its behaviour and its colouring alter completely. It is then that it becomes dangerous as hoppers, young insects that have not yet grown wings, march in great armies and mature insects fly in swarms that darken the sky. The two phases are so different that it was believed that the locusts were of different species, which made the sudden appearance of large swarms inexplicable. Even now there is much to be learned about what triggers the change.

The war makes use of the most sophisticated technology. Satellites track weather patterns that could bring rain and with it the flush of vegetation that might cause a population explosion, followed by the dying back of the plants that crowds the solitary locusts but leaves sufficient moisture in the soil for egg-laying. Radio, radar and advanced techniques of aerial photography are used to locate and track swarms and ground surveys search for solitary locusts that show the tell-tale colour change that spells danger. The battlefield extends from Pakistan and India to the Atlantic and from the Mediterranean to Central Africa.

Mr Baron describes it all and the characters engaged in it. He rejoices with them at their successes but he is an environmentalist and he fears for the future. Like many insect pests the locust is to some extent a product of agriculture. Will our attempts to control it make agriculture more, rather than less, difficult? Should we change the system of agriculture?

The Desert Locust is a factual and fascinating account of man's struggle against what may be his worst enemy.

The factors that control the uses to which the desert can be put are restricted and there is not much a landowner in that region can do to change them. Were conditions more hospitable conflicts of interest might arise as choices widened. Prof. Denman examines these conflicts, arguing that "land", as an abstract economic concept, is meaningless. Land is not homogeneous and in the real world control over its use is vested in its owners and proprietors. He has developed a technique for analysing land use in terms of the "proprietory land unit" and he explores the pressures and restrictions which lead a proprietor to develop his land in one way rather than another. His book is a useful introduction to the subject, but it does not make light reading.

Michael Allaby

### **Scottish Ecopolitics**

THE POLITICS OF ENVIRONMENT by Malcolm Slesser. George Allen & Unwin. £3.

When I grew up, and at fifty I try hard to persuade myself it was not all that long ago, the only thing that seemed to matter in politics was to declare whether one was on the "left" or the "right". This sort of talk still holds the stage, but for about two decades now it has ceased to matter. The Michael Foots, the Tony Benns, the Edward Heaths and Joe Grimmonds continue their attitudinising, their posturing, their carefully managed stage entrances and their solemnly rehearsed parliamentary minuet all unconscious that the audience, if it is looking anywhere, is looking at a quite different spectacle, or taking its chance of slipping away altogether.

The figures of voting and elections may seem to belie this, although not all of them do; one of the most significant being the increase in the number of electoral contests which are not waged at all in local elections, and of those where candidates are being returned on a minority vote in national elections (a figure one well known political journalist describes, as well he might, as "spine chilling".)

Year by year the empty charade of "party conferences" grinds on as though nothing is amiss, but the reason why the centre appears to hold is that the new forces have yet to find their feet, have yet indeed to write a decent text book and have yet to create the organs of propaganda and discussion which are the life-blood of any new movement. But the groundswell, of which this journal is indubitably a part, continues, and now another book has appeared which is concerned to labour the main centre of concern of the new alternative politics. The book has two titles and both of them are significant. The first is *The Politics of Environment* and the second *A Guide* to Scottish Thought and Action.

Many political people continue to assume that environmental considerations are matters which can somehow be latched on to the still prevailing political framework, and betray no inkling that in fact a combination of the startlingly cruel awareness of our environmental limitations and the equally startling resurgence of thought and feeling of localised ethnic groups throughout the world has put the skids under almost every assumption of political organisation, especially political party organisation, that has held sway in these islands for the past two centuries at least.

A Guide to Scottish Thought, inchoate, angry, confused and ill written, as well as being absurdly overpriced at £3 for a mere 175 pages, though it is, is as good an indication as any of this new approach. Despite its manifest defects the book makes its point, and since nobody else is making it readers are warmly urged to brace themselves to reading it. On the very opening page there is the clearest indication that Mr Slessor has got his sights fixed on the main target. One of the main problems of the future, he declares, is the size of the selfgoverning units in a world state. If one excepts Robert Michels and Leopold Kohr, nobody in politics has talked that sort of language since Plato; but then Mr Slessor proceeds to try to damn his own case throughout the book by seeking to insert a centralised, Fabian, Aunty-knows-best approach which is now about as untenable as all the other evils he is attacking. I would guess this to be a major cause of the failure of the Scottish Nationalists to win their case. Never mind, here is a rough and ready run up of the new politics of environmental sanity; occasionally the author shoots wild and he obviously can't dribble for toffee, nevertheless he really is on the ball and playing for the only side that stands any chance of coming top of the league in the long run. And since the team is terribly short of players we should all read his book and be ready to forgive him everything as we resolve to join it ourselves.

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74

### Letters

#### Ecologist and the unions

Sir,

We were interested to note the attention given in the Ecologist (October, 1972) to the Scott Bader Commonwealth, and particularly to the links which that institution has with the organised trade union movement and the Institute for Workers' Control (of which we are councillors). Many trade unionists and socialists have been working over the last decade to restore the aspiration for decentralised, democratic workers' control of industry to the forefront of people's minds. It is therefore most encouraging that ecological considerations have led the authors of the Blueprint for Survival to similar conclusions. (Of course our different starting points inevitably mean that our visions of a future society are by no means identical. For example it is not clear to us whether the authors of the Blueprint would accept the socialist implications of some of their recommendations.)

We believe that the practical experience in self-management of factories such as Scott Bader, and the respect which they show towards ecological factors, give them great value as laboratories, and as witnesses to men's aspirations. We should not expect. however, that our society, in which private ownership and market-oriented priorities dominate production and will be distribution. transformed simply by the multiplication of such experiments, much as we need their example. What is required, above all, is a social and political force capable of asserting rational and humane values, against the polluters and waste-makers whose decisions appear rational and whose actions appear normal only because of the exclusion of social costs from their calculations of economic advantage.

For this reason, we hope that the recent initiative taken at the Labour Party's Annual Conference in October will win the support and attention of your readers.

The ecological movement which has emerged in recent years has given the spur to an impressive array of action groups and lobbies, and we are not suggesting that these should be abandoned in favour solely of work within the Labour Party. But, as the history of utopian communities from Robert Owen to the present day suggests, there are no universal substitutes for *politi*cal action. The presence within the labour movement of the trade union organisations means that within that forum exists the human potential which must be harnessed in the fight for a humane and ecologically viable future society.

Thus the agricultural workers *know* about the problems of factory farming, fertiliser pollution, and the dependence upon non-organic methods generally. The miners and fuel workers have the leverage with which to promote a socially-costed fuel policy, the transport workers are intimately concerned with the arguments for a national transport policy, the chemical workers face dangerous industrial processes as a daily hazard.

If the work of ecologists and industrial democrats can be harnessed to the political weight and will of working men and women, a new and vastly more authoritative campaign, embracing many of the goals of the *Blueprint*, can be forged. No doubt you share with us a healthy scepticism towards the past and existing records of inertia and indifference manifest in established political organisations. Nevertheless, we hope that the *Ecologist* will find space to report the future developments of the Labour Party's newly affirmed policy.

Yours sincerely,

Tony Topham, Colin Stoneman. Dept. of Adult Education, The University, Hull HU6 7RX.

The Ecologist welcomes this initiative, and looks forward to a constructive dialogue with the trades union movement.—Editor.

#### **Buchanan and Bath**

Sir,

Anthony Netboy's letter (*Ecologist*, October 1972) shows how untruth is turned into folklore. On the strength of the article on Bath by Gerald Foley (itself seriously inaccurate) Mr Netboy says "Professor Buchanan is determined with the consent of the town council to destroy the amenities of Bath with a tunnel". May I, as Buchanan's partner in charge of the Bath study, which proposed the tunnel, put the record straight?

Our only purpose in the Bath study was to devise the best means of delivering Bath from the conditions described by Mr Netboy—"Bath was taking a cruel beating from the automobile. Traffic jams were incessant..."

At the time of the study Bath Corporation had no responsibility for public transport (it still has none), nor did the legislation exist for subsidising public transport. Many developments

### THE CONSERVATION SOCIETY seeks an ORGANISING SECRETARY

to be responsible for the Society's presentation to the public, organisation of its part in topical events, and advice and support to its 40 branches. He or she will be responsible to and able to deputise for the Director. He will be helped by, and will be expected to mobilise and co-ordinate, voluntary assistance from the Society's 8,000 members.

The successful candidate is likely to be 25-40, to hold a degree, and to have had administrative experience. He will be broadly familiar with the subject matter of conservation, will probably have played some part—voluntary or otherwise—in the conservation movement, and will support the aims and policies of the Conservation Society.

The job will call for self-confidence, initiative, long hours, hard work, and willingness to travel in the UK. Starting salary will be  $\pounds1,500$  p.a.

Application forms and further information about the Conservation Society may be obtained from The Director, 34 Bridge Street, Walton-on-Thames, Surrey. Closing date for applications is 10 February 1973. in public transport lay in the future. Nevertheless, we investigated the possibility of a total ban on the use of private cars, although we concluded, at the time, that this was not feasible.

We did, however, recommend drastic restraints on the private car. Over the City as a whole 57 per cent of work journeys would be by bus, 31 per cent by car, and 12 per cent by foot or cycle. The proportion of car commuters to the Central Area would be considerably less than 31 per cent, however. We were given neither the time nor the resources to develop this recommendation into a detailed plan for public transport, but it is interesting to note that Professor Goss, in his report to the Bath Environmental Campaign nine years later, did not suggest any greater limitation on car use.

The difference between our recommendations and those of Professor Goss is that, whereas we recommended a tunnel to carry traffic which had no business there underneath the centre, Professor Goss suggests minor road improvements to carry the same volume of traffic through the existing streets.

The purpose of the tunnel, which was part of a comprehensive plan including a sub-surface route in the centre for local movement, car parking arrangements and improvements in public transport, was to reduce traffic in the existing streets to acceptable levels, and progressively to close the streets to private traffic in order to facilitate bus operation and improve environmental conditions. It was certainly not practical politics in 1964 to act on the assumption that overall levels of car use or ownership should or would not increase; these levels have in fact risen faster since 1964 than we expected, and show no sign of falling. But we did produce a plan that preserved the Georgian and mediaeval heart of Bath virtually intact, while still making it possible for it to survive as a shopping and tourist centre whose customers, rightly or wrongly, want both to have civilised conditions within the city and to use their cars to get to it.

But we do not claim infallibility. Neither conditions in Bath nor our own ideas on these matters have stood still. We welcome discussion and criticism of our proposals, but this is hardly possible if people have not taken the trouble to acquaint themselves with our approach or recommendations.

Yours faithfully,

Ann MacEwen, Colin Buchanan & Partners, 47 Princess Gate, London SW7 2QE.

### The foolishness of seal culling Sir,

We must protest at the acceptance and implementation by the National Trust of Mr Bonnar's and Mrs Hickling's report on the Farne Island seals.

This report is obviously written by two sensitive people who have the welfare of the seals at heart. Unfortunately the report reveals their human weakness and is a masterpiece of illogicality and conflicting statements. The report begins by explaining the duty of the National Trust to preserve the islands and the "natural" order. It then goes on to say that the natural order is unacceptable and that pup injuries and mortality, increased aggression and general lack of hygiene are factors that we would not tolerate in "stock animals". This must surely go down in the annals of history as the most irrational, foolish and unscientific statement ever made by a supposedly scientific and ecologically sound report. Are we to judge wild populations by the conditions existing in managing domesticated animals? This statement is all the more ludicrous when stock conditions are examined. Intensive farming has resulted in higher densities of animals and overcrowding is the order of the day. However, the results of aggression are obviously minimised and this is what Mr Bonnar must be aiming at. The report has many other anomalies and tends to play heavily on the "suppurating sores" dying pups saga. It also goes to some lengths to explain how increased cow aggression towards humans is a trait which increases chances of pup survival at the same time mentioning that the increased aggression was something which worried the National Trust. What has aggressive behaviour towards interlopers (humans) to do with managing a nature reserve, especially when the report shows that this is a survival factor?

On the subject of soil erosion, it has been suggested that physical barriers could be erected to reduce or even stop erosion of top soil and vegetation. To argue the erosion factor as a deciding point when assessing the need for culling is the final straw and all credibility ceases.

We submit that the management plan acepted and implemented by the National Trust has been evolved to alleviate only two major factors.

- 1. The increased aggressive behaviour towards humans by adult seals.
- The obviously distressing sight of baby seals either sick or dying and the resulting unhygienic conditions prevailing when corpses or dying animals are littering the island.

These arguments are entirely in human terms and have absolutely nothing to do with the natural order. The culling of seals will obviously alleviate both overcrowding, aggression and erosion but so will natural controls at present affecting the population. It is interesting too that the cull will probably effectively remove the aggressive adults as these will be the easiest to shoot, thus removing a survival factor at one stroke. Culling can be a viable management technique but not at this stage. Another three or four years of breeding needs to be examined before culling is required and if in the meantime natural management of the population has taken place then so much the better.

The National Trust has lost all credibility in implementing this tenuous plan and has shown that it does not have the necessary expertise to render it fit to manage a nature reserve with the international reputation of the Farnes. This is also taking into consideration that the grey seal internationally is a rare animal. We feel sure that Mr Bonnar and Mrs Hickling as authors of this plan will ultimately receive the condemnation from international they deserve scientific circles.

Yours faithfully,

E. R. Sones, J. S. Butter, D. V. Veal, Cowley Wood Conservation Centre, Parracombe, North Devon.

#### Who will stop the coral robbers?

Sir,

I believe I have witnessed the rape of an exquisite natural phenomenon, and am uncertain how it can be prevented. On Tuesday 26th September I went to the famous coral beaches north of Dunvegan Castle on the Isle of Skye. On the first beach was parked a pantechnicon with no name on its sides, surrounded by dozens of plastic bags full of coral, labelled "fertilizer", and a scale. When I asked the men beside the lorry what they wanted the coral for and to whom the land belonged, they looked shifty and embarrassed. The oldest of them said that the coral was for "research" and that the land was crown property. I asked where the research station was and after a pause he said "Birmingham", and added that they had a government permit. I suppose I should have asked to see it, but I was rather intimidated by the gruffness of his manner.

It seems most unlikely that any laboratory would need such a quantity of coral for research purposes, and I am convinced that it was indeed being taken for fertiliser. Goodness knows how often they descend on the beach, but it certainly seemed to me that there was far less coral there than when I last saw it in 1969, and I am afraid that they may extend their depredations to the farther beach, which seems as yet unspoilt (doubtless because it is not accessible to vehicles).

According to W. H. Murray in his Companion Guide to the Western Highlands of Scotland (p268) these beaches are "the best of their kind in Scotland". It is appalling to think that they may be dug up and carted away within a few years, when one considers the thousands of years it has taken them to form from fragments of Caribbean coral brought north by the Gulf Stream.

I would be most obliged if you could suggest persons or organisations who might be able to investigate and stop this business.

Yours faithfully,

Gillian Gayton, The Gardener's Cottage, Sandy Lane Farm, Tiddington, Oxon.

### Old wives' tale Sir.

Having read the article "Breast-fed babies are healthier" written by Peter Bunyard in the November issue of the *Ecologist*, I find myself in general agreement with its content, apart from one alarming error.

The statement in the eighth paragraph that one of the advantages of breast-feeding is that "it has a proven contraceptive effect during the first few months after delivery" is wrong. This idea is an old wives' tale still believed by many members of the general public and by many doctors, who are all sadly misinformed.

Breast-feeding has no contraceptive effect whatsoever and a woman can become pregnant in the first few days after delivery (if no form of contraceptive has been used), whether she is breast-feeding or not.

It is a shame that this statement was made in what was otherwise an excellent article.

Yours truly,

Ann E. Hogg, 16 Highfield Road, Bromsgrove, Worcs.



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#### School clears pass

Sir,

Recently my school, Manchester High School for Girls, has been trying to raise money, by collecting green shield stamps, for a mini-bus. To help raise the money a "sponsored walk and litter collection" was organised. This took place on the 22nd of October. The walk was originally intended to start at Glossop and finish in Hayfield, using the Snake Pass. Unfortunately, due to weather conditions, we could only walk along the Snake Pass until it met the main road so we made up the ten miles by walking along the road into Glossop.

We raised a total of £220 towards the mini-bus, but we also felt we had done something towards solving the increasing problem of pollution. Until then I had not realised just how much rubbish was dumped up there. We collected anything from old exhaust pipes and the insides of storage radiators to sweet and chip papers and old prams.

The Snake Pass is now a lot cleaner than before, and I should like to say how nice it would be if people would stop polluting their own countryside. Yours sincerely,

Jane Riley, Lingerwood, 43 Mauldeth Road, Heaton Mersey, Stockport, Cheshire.

#### Decline of the Breton farmer Sir.

I think you will probably be interested to know that at the Celtic Congress held recently in Bangor, N. Wales, we had a very sad description of what is happening in Brittany to the small farmers. The Breton Delegate spoke of a countryside so altered that its own inhabitants can hardly recognise it any more! Small farmers are the target of Mansholt's policy, we know, and it seems that it has been operating at a great rate in Brittany. Farmers are either bribed or forced in various ways to get out, the fields are rolled into one, the bulldozers get to work, and everything is neatly squared off in a sort of North-South-East-West manner. The little farm roads are obliterated and cut dead straight instead. One village he spoke of had lost its Breton name and all its character, since it became a tourist holiday village for rich French people.

In Wales, we have an acute problem of English second homes, which fetch prohibitive prices for local people, needing homes, to buy. In Brittany they have the same thing. To quote from Goldsmith, a University Chaplain, writing in the Teilhard Review regarding the "Blueprint" there is a society imposing its will on other peoples without regard for the consequences for them or for their environment: "impoverishing the environment for the benefit of the privileged".

Yours faithfully,

Peggy Goodman,

Tyddyn-Angharad, Corwen, Meirionnydd.

#### **Blueprint comments**

Sir,

One of the detailed criticisms of *A* Blueprint for Survival made by Professor Fremlin (Ecologist, July 1972) is surely based on a misreading. The passage he quotes actually states that the proliferation of mutagens must mean a gradual reduction in the adaptiveness of our species, not in its adaptability, as he says.

If you had used the word *adaptedness* instead of the perfectly horrible "adaptiveness", I suspect this confusion would not have arisen. Of course you are right in your assertion: if the species is initially highly adapted and a large number of random mutations are introduced and preserved by medical care, the species will on average become less adapted. The increase in *adaptability* referred to by Professor Fremlin is surely only of real significance if natural selection is allowed to play its part unhindered—which is hardly the case in this country at least.

Incidentally, what is the point of publishing *without comment* clearly mistaken criticisms? The usefulness of the "Comments" feature would be much greater if we knew what the editorial reaction to them was.

Yours sincerely,

Roger S. Haines,

84 Bramhall Lane, Stockport, Cheshire. We are preparing a special article on Blueprint comments to be published later this year—Editor.

#### **Religion and ecology**

Sir,

My attention has been drawn to

Mr A. J. Robinson's letter in the June issue of the *Ecologist* (Vol. 2 No. 6) on "Religion and Ecology". This raises points which deserve more attention. The point which I wish to bring to your notice is that a major function of a positive religio-culture is to provide a society which is cybernetic, which has a built-in alarm system which operates whenever it gets out of balance with its surroundings.

It is interesting that although modern societies are out of control, many early communities possessed such mechanisms. From the point of view of population, many tribes most certainly had access to drugs which limited fertility. and those that did not were forced to adopt forms of human sacrifice (note the sacrifice of the first-born mentioned in the Old Testament). More important was the institution of totemism, where all the members of the tribe were identified with one or other of the important elements in the local ecosystem, and the tribal laws provided a complete homeostatic control which preserved the eco-balance in the tribal area.

Mr Robinson draws our attention to a point so obvious that it is almost always overlooked: it was largely European Christians who willfully destroyed such simple balanced ecosystems, and most of the crimes against nature have been committed by Christian countries or by those under Christian influence. The main reasons for this may be summarised as follows:

Theologically, Christianity presents a Man v. Nature picture. Unlike ancient religions, Christianity denies the possibility of animals or plants having souls. Only Man has a soul which can continue after death, and thus is so vastly superior to animals that he is entitled to use them for his personal convenience.

Christianity takes a short term view of the world. "Take no thought for the morrow". Christianity teaches you to anticipate Doomsday, when the graves will open, Christ will come and the world will come to an end. Most authorities accept that St Paul thought that the Second Coming would be in his own lifetime, which is why he gave no advice whatever on long-term or environmental questions.

Christianity is unconcerned with the world, for there is a "life hereafter" where even the poverty and suffering of this world will be rewarded. For centuries the development of astronomy and science were actively opposed, and medicine was also treated with great suspicion e.g. in the 19th century the Pope opposed vaccination on the grounds that the smallpox epidemic was a punishment sent by God. This constant conflict means that a scientific ethic has never been generally agreed.

For these and many other reasons our Christian traditions have led to an "open-ended", uncontrolled society rather than a cybernetic, servo-society in which we would automatically keep ourselves within the limits of our environment.

I sympathise with Christians who are faced with these facts. Perhaps it is feasible to be a conservationist and a Christian at the same time, just as it has proved possible to be a socialist, a fascist, a slaveowner or a democrat and a Christian at the same time. However, there is little common ground, which is the reason for the failure of all Christian conferences on the environment to reach any agreement; the doctrines of the Trinity and of the Atonement have nothing to say about world problems.

Now those religions and philosophies which contain homeostatic elements we term "Planetarian", which means that respect for the Earth and for Nature are implicit in their beliefs. For the Conservationist it is heartening that in Britain where we had planetarian nature worship before the coming of Christianity, a good few of these old beliefs have succeeded in surviving. I am not referring to nature symbolism such as the mistletoe, and the Xmas tree, or dancing round the Maypole, but rather to the more basic planetarian attitudes such as love for animals, the study of nature, landscape painting and a general love for nature. These are especially British attitudes which receive no justification from the Bible.

May I suggest that the "great revolution of thought", which most conservationists see to be necessary but which never seems to come, will be nothing more than a return to a more refined form of Nature worship, the belief that Man and Woman were appointed the custodians of Mother Nature rather than her predators. This spring of wisdom which has kept flowing for so many centuries alongside established religion can become the heart of a new planetarian philosophy which will provide both the religious and the emotional impetus for the onslaught against the Philistines.

Yours faithfully,

Jason Wych, 75 Sudbury Heights Avenue, Greenford, Middlesex.

### Ecologist box numbers

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We are extremely sorry for the inevitable delay in forwarding replies to box number advertisements and for the inconvenience caused to advertisers and readers.

### Coming events

20 February—Doncaster Museum & Art Gallery Conference "Public Participation in Structure Planning". Details from Mark Andrew, Yorkshire Council for the Environment, Wool Exchange, Bradford BD1 1LD.

11-13 April—The Changing Flora and Fauna of Britain. Symposium held by the Systematics Association at University of Leicester. Further details: Dr Paul Parker, Botanical Laboratories, University of Leicester, Leicester LE1 7RH.

18-19 April—Symposium on Human Ecology and World Development at the Polytechnic, Huddersfield in association with the Commonwealth Human Ecology Council. Further information from A. R. Vann and P. F. Rogers, Human Ecology Symposium, Biology Section, The Polytechnic, Huddersfield, HD1 3DH, Yorkshire. Telephone: 0484 30501 x335.

30 May-2 June—Third Annual Health Foods, Beauty and Slimming Exhibition, Central Hall, Westminster, Further details: Graham Claringbold, Marketing Exhibitions Ltd., Milton House, 25 Oakhill Road, London SW15 2QJ. Tel. 01-874 2374.

3-7 June—Man's Impact on the Canadian Flora. Annual Meeting of Canadian Botanical Association at University of Western Ontario, London, Ontario, Canada. Further information: Chairman, Local Arrangements Committee, C.B.A./A.B.C., Dept of Plant Sciences, University of Western Ontario, London 72, Ontario, Canada.

16–20 July—At Alsager College of Education Summer School, Cheshire. Course: Environmental Education—Objectives and their achievement. Topics include work of the Schools Council Project Environment; Population, Resources and Pollution; Ecology of Production Systems; Landscape Reclamation; Games and Simulations; National Parks and Environmental Education; the School Estate as an Educational Resource.

17-20 July—Conference on Pollution Criteria for Estuaries. Details from Conference Secretary, Department of Civil Engineering, University of Southampton, Southampton SO9 5NH.

24–28 September—First World Congress on Water Resources, Chicago, Illinois, USA. Details from Secretary General International Water Resources Association, Science Complex Building, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53201, USA.

9-13 September 1974. Water Pollution Research. Seventh International Conference. Paris. Completed papers on all aspects of water pollution research in the freshwater and marine environment are invited before 7th November 1973 for the above Conference. Enquiries: contact Dr S. H. Jenkins, C/o Upper Tame Main Drainage Authority, 156/170 Newhall Street, Birmingham B3 1SE.

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