

# ecologist

Vol. 3 No. 4 April 1973 25p

**FOULNESS :**  
from Heathrow  
to death-row



Lord Gladwyn on Growth  
Goodbye Galapagos • Cornwall's wallet democracy

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# ecologist

Vol. 3 No. 4 April 1973

## London motorway cash-box

When Shaw wrote, in *Man and Superman*, that "Democracy substitutes election by the incompetent many for appointment by the corrupt few", he no doubt exaggerated the situation for the sake of epigrammatic force. However, whether or not the many are incompetent and the few corrupt, there can be no disputing that today's bureaucratic version of democracy is undemocratic. Nor that bureaucracy forces individuals and organisations into forming pressure groups. Nor that, because the bureaucracy is not sufficiently open or accountable, some of these pressure groups have an unusually and perhaps unacceptably close relationship with it. Certainly the situation demands constant watchfulness, and close study of the bodies that claim to represent the public is a necessary insurance against funny goings on behind the filing cabinets.

Take for example the British Road Federation and the British Industry Roads Campaign. Both are well worthy of study, not least because—whether we know it or not—many of us are represented by the former via membership of the Automobile Association, and because both bodies, having convinced themselves that their work is in the national interest, lay claim to representing the best interest of us all.

According to these organisations themselves they really do their job rather well: "The British Industry Roads Campaign was set up (in 1969) to combat the causes of congestion on Britain's roads. It was formed by a group of the country's leading industrialists not content to see their own and the country's resources being

wasted through inefficient communications. By influencing public opinion and by direct pressure on politicians and government administrators, the BIRC has taken the offensive against the laissez-faire approach that has traditionally dogged road-planning.

"Already, road plans announced for

the next decade can be accounted in some measure a success to the BIRC. The Secretary for the Environment has announced plans...very close to the BIRC demand..."

The other body, the British Road Federation, was established forty years

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## Profits of doom

Four hundred top- and second-flight managers descended on off-season Davos, Switzerland, for the 3rd European Management Seminar—a 10-day February ski-in costing their companies £550 in registration fees and who knows how much in hotels and expenses.

Theme of the conference was "Business and the Enlarged Community", and its aim a constructive dialogue between Eurocrats and businessmen.

Major achievement of the conference was its failure to even consider two major problems: the poverty of the non-industrial world, and the threat to the environment posed by unchecked growth and ham-fisted technological development.

Two discussion groups scheduled, didn't take place—no one applied to join: "The Community Environment Policy" and "Rapport de l'entreprise européenne avec les PVD". Perhaps not everyone knew what PVD were (Europese for non-industrial countries—pays en voie de développement), or perhaps they did.

At the Kepner-Tregoe sessions, designed to revolutionise managerial decision-making processes in one

traumatic week, businessmen bent their energies to solving the complex problems of a mythical men's toiletries enterprise setting up shop in Puerto Rico, and other relevant "case studies". K-T men told the *Ecologist* that they had in fact slipped in a "case" of a socially-oriented company, more interested in serving the community than making profits. Businessmen chewed it over for several hours, but eventually spat it out with the conclusion that company policy was all wrong: what they should be trying to achieve was a higher return on assets.

There was barely any awareness of ethical and ecological priorities, and the following remarks are typical:

"It is scarcely necessary to insist on the need of modern industry to obtain ever-wider markets for its products in order to grow and progress"—Oliver Long, Director General of the General Agreement on Tariffs and Trade;

"It follows as night does day that we are going to have to continue to create resources, and ever more resources, if there is to be visible progress towards the goals our people seek"—William D. Eberlé, special US representative for trade;

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"It is out of the question to stop growth, since this would mean renouncing innovation, while European integration itself is an innovation and can only develop with more innovation"—Altiero Spinelli, member of the Commission of the European Community in charge of industry.

Britain's Roy Jenkins was one of the few to dwell on the subject of third world poverty—but with great delicacy he skirted the development-environment controversy.

## No problems, only chaos

Antony Wiener of the Hudson Institute was not so shy. "Technological growth and economic progress will be able to make all reasonably rich", he assured his audience. "Technological advancement, along with self-restraint, proper policies and designs, and the allocation of sufficient resources (mostly money), will enable us to cope with the various problems. Central to our conception of the Prospects of Mankind study is an assumption that there are enough raw materials for all and (with reasonable decisions and practices) no disastrous pollution problems either... The first assumption is a fact, the second has a high probability of being true."

But the man who capped them all was the senior executive of a major computer company, who when asked what he thought of growth, etc., and assured that his comments were not for attribution, replied:

"Actually, when a friend of mine from the UK Ministry of Defence told me there were contingency plans for keeping the populations of big cities from making a mass breakout when food supplies break down, I couldn't believe it, but now I think they'll be eating human flesh in the streets in New York, London and Paris in 20 years or so."

Asked who he would eat, he replied: "I'll eat off the land around my country estate."

Every participant and journalist in the conference was issued with a briefcase and a blue and gold plastic plaque bearing the words, "Today is the tomorrow we worried about yesterday".

We were right, too.

Vanya Walker-Leigh

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# WALLET DEMOCRACY?

Mr Geoffrey Rippon has said no to the airfield. Not, unfortunately, to the grandiose one proposed for Foulness (Maplin), but to a modest little affair at Treswithick, Cornwall. The implications of his decision are by no means so modest, however, for in making it the Secretary of State for the Environment has affirmed a principle of vital importance to all defenders of England's rural beauty—and has goaded Mr Mike Robertson, the airfield's backer, into openly wielding his wallet to brow-beat and bully the local people who oppose him.

Mr Robertson is boss of Trago Mills, an aggressive go-getting company with three out-of-town shopping centres, one in Devon and two in Cornwall. His Helston branch, one of the two in Cornwall, has been refused planning permission and ordered to close, but Mr Robertson does not think this a good idea and is keeping the place open. His three centres, though a source of anxiety to the small shopkeepers nearby, are a boon to motorised shoppers as they provide a vast range of goods at considerable discounts. Because of this, and because they provide jobs in a region of high unemployment, Mr Robertson is convinced that opposition to his buccaneering enterprise should be swept aside.

He makes sure that it is with the aid of a "ruddy good lawyer" and a barrage of propaganda. In his regular full-page advertisements in the *Sunday Independent*, he unburdens himself of his curious political philosophy (the Liberal Party would be best of the three if it were led by Enoch Powell), some splendid jokes, and his abundant contempt for planning committees, local authorities, and the other instruments of democracy.

"NINETEEN SEVENTY-THREE promises to be a year of TOP TRAGO ENTERTAINMENT," Mr Robertson recently declared a propos of his Helston dispute. "For just in case the magistrates support the Western Area Planning Committee in putting twenty-eight of our staff out of work, I have

organised a couple of INFLATABLE BUILDINGS, each one of ten thousand square feet floor area!! They can be erected upon any level site in one day and can be removed in the same time... though in fact, with careful manoeuvring through Planning applications, refusals, appeals against refusal, waiting for the Secretary of State's decision, enforcement notices and finally a court hearing, I reckon, conservatively, that we can hold the fort for between fifteen and eighteen months wherever we pitch the Trago camp!! Now if you think this as much fun as I do, and you also own a small level field alongside a fairly main road in West Cornwall, I'll pay you a HUNDRED POUNDS AN ACRE PER YEAR, or, if upon a approach road to, and in sight of, County Hall up to TWO HUNDRED POUNDS AN ACRE!!! That has to be better than farming, and anyway, you will be helping in a jolly good cause... SAVING LOCAL PEOPLE'S JOBS FROM BRUTALLY HARSH AND UNPOPULAR PLANNING ACTIONS."

There you have the man: brash, amusing, outrageous, superbly confident of his inability to be wrong, a populist who apparently believes the cash box more democratic than the ballot box. A man who, not content with a string of discount stores, wants a commercial airfield, servicing freight and passenger flights, with a restaurant, motel, and flying club—all on beautiful breezy Bodmin Moor. This was, and probably still is, Mr Robertson's original ambition for Treswithick. It provoked fierce opposition from the local people, and a largely grass-roots campaign was launched against it.

## A policy for beauty

Mr Robertson did not publicly abandon his ambitions until he was forced to do so by the brutal realities of a public inquiry last year, at which he reduced his applications to four: to use the land as an airfield (non-commercial), to erect a control tower and a hangar, to build a club house

and staff accommodation, and to improve an existing building. The DoE inspector approved all four applications, but his recommendation was rejected outright by Mr Rippon in February. Mr Rippon stated that while he accepted his inspector's report on all matters of fact, he differed in his general conclusions. A flying club for Cornwall was indeed desirable, but "the airfield and associated development for which planning permission is sought are situated in an Area of Great Landscape Value, adjoining Bodmin Moor, which is designated as an Area of Outstanding Natural Beauty". The Secretary of State affirmed that "as a matter of policy such areas must be preserved as far as possible against intrusions by enterprises which are likely to detract from their character as havens of rural beauty and peace". Flying and the enjoyment of rural tranquillity are both minority pursuits, and they cannot be enjoyed together. But Cornwall is not as yet so overcrowded that room cannot be found for a flying club somewhere not designated as an Area of Outstanding Natural Beauty (AONB) or an Area of Great Landscape Value (AGLV).

All those who care for the future of England's National Parks, AONBs, and AGLVs, will warmly welcome this statement of policy of Mr Rippon. But Mr Robertson is not so pleased. He has been using Treswithick as a flying club since 1970, and will not stop until he finds somewhere else, and possibly not even then. He has spent £60,000 on the place, and he is angry. Soon after the rejection of his airfield, he announced that he was dropping his financial support of the Conservative Party, and instead joining the Liberal Party, confident that he can purge it of what he calls "woolly minded, sickly and thoroughly unwholesome idealists". He has also promised £2,000 for every Liberal candidate in the South-West, an offer which could cost him over £25,000.

Then on 25th February, his full-page advertisement in the *Sunday*

*continued on page 125*

ago "to project the importance its members attached to good roads and efficient transport." The BRF's activities take the shape of publications, advertisements in the Press, studies, exhibitions, informal meetings, and representations to both central and local government in the form of evidence to inquiries and commissions. In the last three years there has been very close cooperation with the BIRC, which, while not being a member of the BRF, is nevertheless fully represented in its decision-making process and gives the Federation financial assistance.

The decision of their memberships to keep these two organisations separate from each other was undoubtedly shrewd. In the mind of the general public the presence of an overtly industry-linked road-lobbying campaign, the BIRC, conjures up the impression that the other organisation, the BRF, is not industry-oriented in its thinking. However, an analysis of the membership of the two bodies enables us to understand the strange similarity between their interpretation of national interest and the construction of more and more roads. From a straight count-up of the organisations in membership and giving financial support to the activities of the BRF and BIRC, the FOE research group concludes that 39 per cent and 57 per cent respectively would benefit directly from increased road construction and increased road vehicle construction and usage (although my own preliminary calculations suggest that the proportions are considerably higher). Companies and trade associations with such obvious vested interests range from the Sand and Gravel Association to Taylor-Woodrow, and from Wimpey back to the Asphalt and Coated Macadam Association. It is hardly surprising that they've a soft spot for roads.

Now none of this is particularly Machiavellian, as long as we all understand the motivation of such organisations which from time to time claim to represent our best interests: their supporters want more roads because more roads mean greater profits. But sadly, in their attempts to get their own way (and, presumably, to build it) BRF and BIRC are sometimes able

to exert just a little more pressure than is good for us.

While it is wrong for Londoners, fearful of the destruction to be caused by the GLC's motorway schemes, to suggest that there is hand-in-glove collusion between the GLC and the BRF/BIRC, they are right to worry about letters such as that signed by J. R. Fitzpatrick, Assistant Director of the GLC's Planning and Transportation Department on 10th November 1969 and addressed to R. H. Phillipson of the British Road Federation.

"Dear Phillipson,

As arranged on the telephone I enclose some comments on *Motorways in London*. They are only first thoughts and initial technical reactions. You appreciate that they are not intended for publication and they do not represent the Council's considered views on this book. However I hope that the comments on this basis will help in your immediate purpose."

There follow ten pages of detailed criticism of *Motorways in London*, the product of research undertaken for the London Amenity and Transport Association, which formed the basis of the amenity bodies' original objections—and which, of course, had to be discredited by the BRF in order for the go-ahead to be given for millions of pounds worth of roads. The comments are headed "Confidential" and although signed by the Assistant Director, the letter interestingly bears the reference "PFS" of Peter F. Stott, Joint-Director of the GLC's P and T Department, creator of the Hammer-smith flyover, and past-President of the Reinforced Concrete Association and of the Concrete Society.

Of course there's nothing the matter with GLC personnel providing the BRF with advice about motorways in London—even while the Greater London Development Plan Inquiry was going on—but it would be interesting to know how many of the 21,000 individual objectors to London motorway schemes received similar assistance.

It is also unfortunate that when Professor Alan Day, a BRF consultant who floated the idea of an urban motorway in the place of the present North London Railway Line, appeared at the GLDP Inquiry as a witness put up by BRF/BIRC, it was not made public that it was he who acted as economic advisor to the GLC during

the period when they drew up their motorway plans. Such omissions make Londoners not only worried but angry.

We know that people are not important enough to stem the flow of asphalt. But however late in the day, many of us would like to pass on to the GLC, BRF and BIRC, all of whom purport to represent our interests, just one maxim—again of George Bernard Shaw: "Do not do unto others as you would they should do unto you. Their tastes may not be the same." I've a feeling the GLC elections will show that Londoners really mean that.

Graham Searle

## Population Day

May 12 1973 is to be Britain's Population Day.

On that day the organisations concerned with conservation and population questions will join together to impress on the Government, local authorities and the British public the implications of the population problem and to call for action.

The Government will be reminded that the British Prime Minister was a signatory with 37 other heads of government to the 1967 United Nations statement on population. The Government will be asked

- (a) to recognise and declare publicly that the size of the United Kingdom population is a rightful concern of government; and
- (b) to take effective action to stabilise the population at a level which can be sustained by encouraging voluntary measures to this end.

Public authorities will be asked to declare that family planning advice and services should be freely available and free of charge to all.

The public will be encouraged: to realise the implications of population size and human reproduction for the family and the community; to improve the quality of the environment in which children are raised and people live; to develop attitudes which foster respect for small families; and to avoid unwanted child bearing and so enhance the quality of their lives.

For further information contact:

Mrs. Pamela Lewis, 20 Bride Lane, Fleet Street, London EC4. Telephone: 01-353 4691, 01-789 3879 (evenings).



*Independent* opened with a full-blooded attack on Mr Rippon and the Bodmin Countryside Group. "WHAT AN UTTER FARCE...our Tory masters have made of Public enquiries", cried Mr Robertson, forgetting the monkey he daily makes of planning procedure. What is the point of spending so much money (between £9,000 and £12,000 was his guess) on a public inquiry, he asked, only to have the inspector's decision overturned by his Secretary of State?

It sounded like vintage Robertson: intemperate, petulant, but harmless. It was not. Vintage it may have been, a temper tantrum no doubt, but this time dangerous.

Dangerous because the advertisement persuasively entwines truth, half-truth, omission, and innuendo; and uses this seductive mix to pressure politicians and browbeat the public.

In his advertisement, Mike Robertson by omitting Mr Rippon's reason for rejecting his inspector's advice gives the impression that the decision was totally arbitrary. We know it was not. He makes much of the time the inspector spent in getting to know the site and of the "fact" that the "Minister" did not.

Well, the Secretary of State may not have visited the site, but his Minister,

Mr Graham Page, did. There is much that is imperfect about current planning procedures, but Mr Robertson can hardly complain of the common practice of the Secretary of State overruling one of his inspectors. He certainly would not have done had the inspector found against him; and indeed when he lost the public inquiry over his Helston branch, Mr Robertson quickly appealed.

It is not clear why Mr Robertson singles out the Bodmin Countryside Group, since opposition to his airfield was by no means confined to it. He accuses its committee of misleading the membership into overspending on the campaign, so that it is "not only flat broke, but deeply in debt to boot". Yet although its campaign cost the BCG over £3,000, less than a third was provided as a loan (the rest coming from subscriptions and donations), half of which has now been paid off—and subscriptions are still coming in. The rest of Mike Robertson's abuse of the BCG is devoted to threats: "I wonder whether the rank and file members are aware their leaders committed them to an exceedingly costly and in my opinion unjustified fight which, and let this be clearly understood, has only just begun. Apart from the very much larger sum which you must now donate for the next rounds of the Airfield

battle, what about your cash ability to fight the things that really do matter on Bodmin Moor...?"

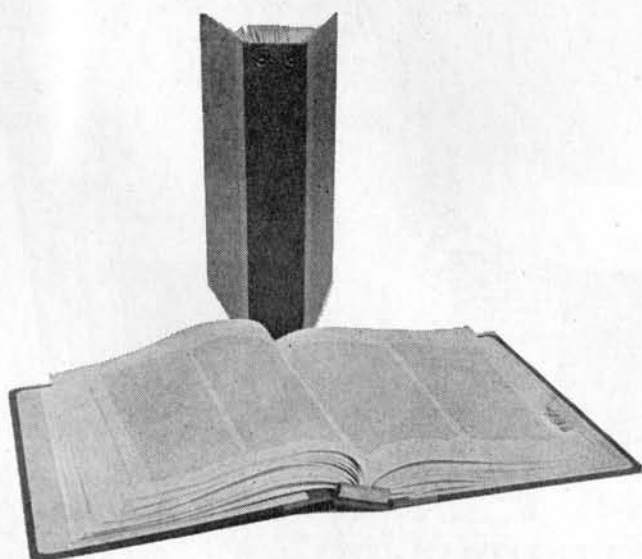
Thus Mr Robertson uses his piggy-bank in an attempt to brain the opposition. The combination of bullying and misrepresentation is what he calls "a clean and honourable fight", a defence of democracy, and with it he appeals to readers of the *Sunday Independent* to write letters on his behalf to MPs. He claims the support of two Cornish MPs, Tory David Mudd and Liberal John Pardoe, though both deny it. No doubt they know how difficult it is to safeguard disinterested decision-making without having to cope with the power of the paid advertisement.

It is a pity that such care was not taken by the *Sunday Independent*. There is nothing wrong with buying space to put across a case, as long as the case is presented honestly and with absolute accuracy. Mr Robertson cannot claim to have done this; and the *Independent* (an IPC newspaper) has failed in its responsibility of ensuring the accuracy of its advertisements. For Mr Robertson's demonstrably misleads.

Unless the country can be protected from such practices, it will be pressured inexorably towards Mike Robertson's planning paradise—a wallet democracy.

Robert Allen

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healthful countenance

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I say,  
No  
Mo..AA  
AAA...

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effects of the excessive consumption of Indies  
sugar.

anno domini 1973 Richard Willson facit



# Comment

## Sweet and low

If our brains are starved of sugar we will go mad and die. If our bodies are starved of sugar we will lack energy, grow weak and finally, overcome by lassitude, we will drift peacefully to the country from whose bourne no traveller returns.

We need sugar to maintain our body temperature and so our requirement increases during cold weather. Our risk is greatest when post-Christmas poverty coincides with January, which frequently it does.

Sensible of our danger, the British Sugar Bureau has thoughtfully produced a booklet\* which urges us not to omit the sugar when hardship, indigestion or fashion persuades us to diet. "Cut out the carbohydrates—including sugar—and your body will have to get its energy from fats and proteins, which could be wasteful and expensive," says kind, thrifty Auntie BSB. Recognising that in adequately large quantities sugar becomes sickly and palls, she has collected a number of recipes to help us consume more sugar painlessly. We may add sugar to obvious foods, such as puddings, to less obvious ones like Devilled Prawns with Egg Mousse and to ambiguous ones like Sweet'n Sour Chicken. We can even have sugar with Chilli Con Carne or pork chops and we'll hardly notice we're eating it at all. A spoonful of medicine helps the sugar go down.

All the same, there are a few strange omissions in a booklet that includes sections on the history of sugar and on simple nutrition. There is no mention (historical) of the fact that when our sugar intake was restricted during the war our health improved, nor of the fact that at the rate we devour it in Britain it is a prime cause of dental caries, nor of the fact that it has been indicted, on impressive evidence, as a cause of diabetes, obesity, coronary thrombosis, appendicitis, cholecystitis, periodontal disease, colonic stasis, varicose veins, femoral thrombosis, haemorrhoids, diverticulosis and peptic ulcer. To name but a few. But then, these are long, difficult words unlikely

to interest the simple housewife whose husband's brain is already softened as he lies listless and cold by the empty hearth. Sugar would give him instant energy.

Like the rest of us, Auntie has her living to earn and she has the one-crop economies of certain impoverished islands to sustain. It must be nice to be able to do well by doing good. Whatever would we all do without her? Well, we might live longer.

Michael Allaby

\* *A Spoonful of Sugar*, available from the British Sugar Bureau, 140 Park Lane, London W1Y 3AA, price 10p including postage and packing.

## Who will look after us in our old age?

The question is often heard in reply to suggestions that we reduce our birth-rate, or even our population. It springs from the realisation that if we have less children, there will be less of them to support us in our retirement, that the ratio of active to dependent people will move adversely. This is less than half the story, however, and the question should be taken as evidence of stupidity, rather than profound thinking. It happens that more than half (55 per cent) of the dependent persons in Britain are children under 15. Any reduction in birth-rate would bring immediate improvements to the activity ratio of the nation, and it seems clear that the gains to be made for the first 50 years following such a move, would far outweigh the losses in later years. Indeed if one allows that savings appreciate, by interest on monetary investment, or by application of the "social time preference rate" (STPR), the advantages of reducing birth-rate are fantastic, and provide another powerful argument for the birth control lobby.

## Net welfare contribution

The 1971 census indicates the numbers of economically active, and inactive, people throughout the population. In Table 1 is calculated the "net welfare contribution" of each age group from the assumptions

1. That all inactive people put an equal burden on society;
2. That all active people contribute equally to their support.

Neither assumption is likely to be strictly true, but no concessions to be made about the extra burden of the old,

or the extra hard work of the young, are likely to jeopardise our conclusions. No distinction is made between public, and in-family, costs to society. The contribution of each active person has been adjusted to balance the total welfare fund in 1971. The "net welfare contribution" is measured in dependent-years (x 1,000). (A dependent-year is possibly equivalent to £400 at today's values.) It can be seen from Table 1 that the "net welfare burden" of the under 15 year olds is about two and a half times that of the over 65s.

## Abolish childbirth!

It will be instructive to follow what happens to the "welfare fund" in the years after the complete abolition of childbirth, Table 2. It is of course necessary to make some assumptions about the population and activity rates of each age group at future epochs, and much the simplest method would be to assume that they will remain as now. It would be more realistic, perhaps, to assume that each age group will expand slowly, since the present distribution is the result of a rising population, but again, these errors are unlikely to challenge our conclusions significantly. Following the abolition of childbirth, one age group after another becomes extinct, starting with the under 5s, and its contribution to the net welfare budget is removed. The annual welfare balance moves quickly into heavy surplus, which is slowly reduced as the younger workers disappear. At about 51 years the annual budget again balances, before moving into deficit, as only retired people are left. The budget balances again of course when the last person has died. The accumulated welfare fund, however, remains in substantial surplus in spite of the drawings in later years. And the last column shows the same fund invested at 5 per cent interest (above inflation). (If 5 per cent seems unreasonable, it should be remembered that the government uses a rate of 10 per cent p.a. to evaluate its own projects, e.g. Roskill, on the third London airport.) This table yields the extraordinary result that by the 30th year the accumulated welfare fund is large enough to keep the entire remaining population (30 million by then) in retirement for ever!

## Interpretation

One need not be too concerned about the literal interpretation of Table 2,

since no one, so far as I know, is calling for the total abolition of childbirth. Its value is in the prediction of smaller effects from smaller changes in birth-rate. The relationships examined are linear, therefore a 10 per cent change in birth-rate should produce 10 per cent of the predicted effect. Population stabilisation in Britain demands a reduction in the absolute birth-rate of about 25 per cent. Table 3 examines the approximate value to society of implementing such a policy. (Assuming a "dependent-year" to be worth about £400 at 1971 values.) It must be realised that much of the saving in earlier years will be in-family, and not available directly to the Chancellor. According to the table, by the year 2000 Britain would be better off to the tune of £60,000 million (the American Moon programme cost £10,000 million), and by the year 2035, when today's infants will be retiring, better off by £400,000 million. The cost of achieving population stabilisation through provision of a comprehensive and well advertised family planning service has been estimated at £10 million per year.

This then is another powerful argument for the economic advantages of reducing our birth-rate. It suggests a return within 20 years of £150 on every £1 invested in family planning services. This is in addition to the saving of welfare costs resulting from a smaller proportion of "unintended" babies, usually estimated at £100 saved for every £1 invested in family planning services. In addition there is the saving from not having to expand urban fabric to accommodate an expanding population. The South Hampshire Plan suggests that this may be as high as £6,000 per place, for sewers, roads, school buildings, hospitals. This saving may be £130 for every £1 invested in family planning. These three factors together yield a return on investment in family planning of 380:1. There is room here for a lot of error, without jeopardising the conclusion that family planning is a good investment. Indeed, allowing people to have children begins to seem an act of sheer wanton extravagance.

John Worley

#### References

1. 1971 Census, preliminary report.
2. *Family Planning in Britain*. (Office of Health Economics.)
3. *South Hampshire Plan—An Objection*. (Unpublished paper of Portsmouth Branch Conservation Society, 16 Georges Avenue, Havant, Hants.).

TABLE 1. WELFARE DEPENDENCE OF EACH AGE GROUP IN BRITAIN (Units of welfare are thousands of dependent-years per year)

Age Group	Total in group '000s	Active '000s	Inactive '000s	Net Welfare Contribution
0-5	4,626	—	4,626	-4,626
6-10	4,492	—	4,492	-4,492
11-15	4,028	35	3,992	-3,951
16-20	3,707	2,357	1,350	1,342
21-25	4,103	3,071	1,032	2,475
26-30	3,457	2,423	1,033	1,734
31-35	3,168	2,293	874	1,745
36-40	3,081	2,372	709	2,000
41-45	3,240	2,577	662	2,281
46-50	3,466	2,768	698	2,463
51-55	3,143	2,435	708	2,073
56-60	3,269	2,339	929	1,742
61-65	3,096	1,648	1,447	435
66-70	2,599	531	2,067	-1,461
71-75	1,918	185	1,732	-1,521
76- onward	2,427	88	2,339	-2,239
	53,827	25,122	28,690	0

TABLE 2. WELFARE FUND, IF CHILDBIRTH STOPPED TODAY.

Year	Surplus welfare this year	Welfare Fund	Fund invested at 5%
Now	Nil	Nil	Nil
5th	4,626	23,130	29,514
10th	9,118	68,720	95,833
15th	13,069	134,065	205,663
20th	11,727	192,700	337,244
25th	9,252	238,960	505,142
30th	7,518	276,550	703,589
35th	5,773	305,415	945,744
40th	3,773	324,280	1,243,601
45th	1,492	331,740	1,610,907
50th	971	336,595	2,065,036
55th	-3,044	231,375	2,641,180
60th	-4,786	297,445	3,350,725
65th	-5,221	271,340	4,244,990
70th	-3,760	252,540	5,383,297
75th	-2,239	241,345	6,845,098
80th	Nil	241,345	8,720,060

(Units are thousands of dependent-years)

TABLE 3. EFFECTS OF POPULATION STABILISATION POLICY ON WELFARE FUND.

Year	Surplus welfare this year (£ mills)	Welfare Fund (£ mills.)	Fund invested at 5% (£ mills.)
Now	Nil	Nil	Nil
5th	462	2,313	2,951
10th	911	6,872	9,583
15th	1,306	13,406	20,566
20th	1,172	19,270	33,724
25th	925	23,896	50,514
30th	751	27,655	70,358
35th	577	30,541	94,574
40th	377	32,428	124,360
45th	149	33,174	161,090
50th	97	33,659	206,503
55th	-304	23,137	264,118
60th	-478	29,744	335,072
65th	-522	27,134	424,499
70th	-376	25,254	538,329
75th	-223	24,134	684,509
80th	Nil	24,134	872,006



# Gremlin

## The age of the grocer

Tilling the earth is all very well but in this day and age the true environmentalist unearths the till. The age of course, as Gremlin and Mr Heath know, is the Age of the Grocer, and one grocer in particular, Mr Timothy Sainsbury, is about to do very well out of the environment. The Government has promised him £60,000 over three years to set up a Retail Planning Unit, by which it means a data bank for shopping centre developments. The cash comes via the Centre for Environmental Studies, the organisation which assures Britain's world lead in vital ecological research.

Shopping centre developments are one of the world's most threatened ecosystems. Already outbreaks of small farmers and even smaller shopkeepers threaten to reach epidemic proportions and wipe out such species as the Price-rite, the Tesco, the Liptons, the Finefare, and the Sainsbury. Britain's first environmental knight, Sir Peter Scott-Porage, has appealed to the Government to set up special reserves, and it looks as though at last it has begun to do so.

## Where there's muck, there's a huckster

"Swimwear and beachwear provide the only bright spots on some of the world's polluted beaches. As the water laps black slime and the surf breaks grey, holidaymakers sport more colourful beach- and swimwear". Thus those Cousteaus of the costume world, Lloyd Menswear, in the Jan/Feb issue of *Lloyd Menswear International*. They know, as Thor Heyerdhal apparently does not, that sea pollution is good for us all. So if you too want to be gayer than a guillemot, prettier than a puffin, read on:

"As the air-pollution of 19th-century industrialisation had its effect upon fashions in men's business wear, so sea-pollution may influence men's choice of beach- and swimwear in the last three decades of this century..."

"Polluted beaches compel bathers to congregate on the strands left clean. Or around swimming pools..."

"The more bathers get together, the closer they look at other men's costumes—and their own... A man who wore the same swimtrunks year after year on a sparsely populated beach becomes self-conscious about wearing the same pair too often in a crowd."

Lest any of you fear that this welcome development, like so much environmental bandwagonry, is a passing fad, Lloyd Menswear have news of great comfort for you:

"The brighter look for men's beach- and swimwear is likely to be long-lasting, for the pollution of our bathing beaches is not a passing phase. Nor is it confined to *Torrey Canyon* disasters. Infra-red photographs taken from satellites as they orbit over the world's seaside resorts show that the dumping of industrial waste and the pumping of municipal effluent daily pollutes delta and estuarial waters. Oil discharge and effluent from shipping and coastal power-stations gives a dirty look to beaches far removed from big cities".

## Cock-up Cola

Coca-Cola, makers of the only beverage of which it has been said, "it's an imitation, beware of the real thing", have announced another of their National Environment Competitions. The trouble is their public relations department has not the slightest idea why.

"More than 150 million drinks of Coca-Cola are sold every day in over 130 countries", they say. "Why then are we putting time, talent and money into projects connected with the environment which, so far as we know, may never sell a single bottle of Coke?"

It's a difficult question, and Gremlin admits that, for the moment, the answer escapes him. But the good PRs of Coca-Cola are troubled by still knottier problems.

"Our motives are often suspect to people who cannot understand them" (hasty mutterings of denial). "Are we just jumping on to a fashionable bandwagon (sic) to gain some mysterious kind of publicity? Is there some ulterior motive behind our interest in environmental education?"

Well, Coca-Cola, as to the first of these two questions, no, probably not, the publicity you wish to gain is not at all mysterious, but that good old-fashioned, hoot'n toot'n, bang it on the big bass drum, ain't we great, kind

of publicity. As to your second—but I see you knew the answer all the time:

"You could call our concern for the environment 'enlightened self-interest'. Coke is a fun drink. If the environment is so unpleasant that people aren't enjoying it then an awful lot of fun things—including Coke (sick)—are likely to lose out." Besides, "without fresh water we have no business".

Improbable, but still. What do they do? They have a competition that will educate all those young people who will have to cope with even more than 150 million drinks of Coke a day and other environmental problems. And to judge it they get: Lord Chalfont, distinguished author, politician, expert on disarmament, and Coca-Cola drinker; Robert Boote, deputy director of the Nature Conservancy, conservation's *eminence grise*, and Coca-Cola drinker; Richard Jennings, director of the British Trust for Conservation Volunteers, and Coca-Cola drinker; Brian Johnson, director of the Ecological Foundation, associate editor of the *Ecologist*, and Pepsi-Cola drinker (which he gets down faster than he'll live it down); and TV fizz-kid, Dr Kit Pedler, who invented Coca-Cola specially for his Doomwatch series.

"Many years ago", say Coca-Cola, who refused to educate a Gremlin aide as to how many of their daily 150 million drinks come in non-returnable bottles, "that far-seeing historian H. G. Wells wrote: 'Human history becomes more and more a race between education and catastrophe'."

"We are on the side of education".

I wouldn't bank on it...

## And now, live from Cornwall...

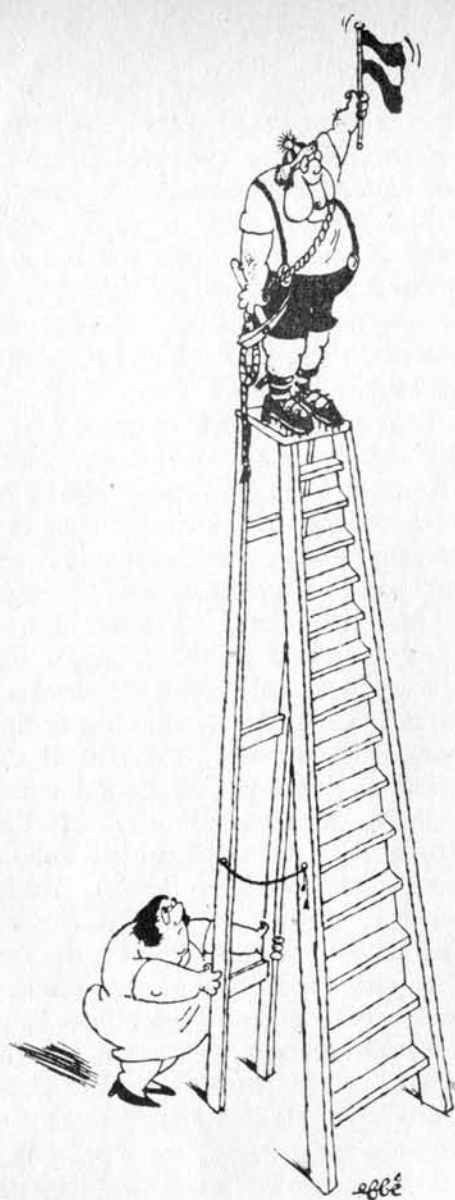
Bunyard has been discovered. He was on the box two nights running and has been booked for a third. The Gregory Peck of the piggeries now makes up more often than he mucks out.

With one or two of the world's food problems still outstanding, Allaby has rented an allotment. Pastoral bliss has never looked quite so pinched and miserable as Allaby and wife clearing the brambles and turning the sod while the great chamber pot in the sky is emptied over them.

Allen is the only one of the team to have steadfastly refused to cultivate the land. The only subsistence methods for him are hunting (house) and gathering (wool). That's what he calls it. We call it shopping.

# The logic of growth

by Lord Gladwyn



7233

It is a truism that growth cannot continue for ever. The question is not whether it will end, but when and how. Lord Gladwyn suggests that it may end not in world-wide collapse but in regional totalitarianism, with Japan allied economically and philosophically with China, a new social and political system in the socialist countries, the industrial economy of the United States in collapse, Western Europe living within its resources, and the populations of the Third World victims of a series of natural disasters.

Lord Gladwyn was a senior British diplomat until his retirement. He is now Deputy Leader of the Liberal Party in the House of Lords and a member of the Parliament of Europe. He took part in the negotiation of the Charter of the United Nations in San Francisco in 1945 and was its first (acting) Secretary-General.

As I understand it, the general conclusion of *Limits to Growth*, published under the auspices of the "Club of Rome", is that unless something is done about it in the next few years on a global scale, the inevitable "exponential" increase in the population of the world (which is due to double by the end of the century) will eventually out-run the available food supply, and that, even before it does so, the process of industrialisation necessary to support the increase in population will have to proceed at such a pace that many of the essential raw materials will be exhausted and the pollution of the oceans and the atmosphere increased to such an extent that those who do not die of inanition will be slowly poisoned, if indeed they are not killed off by pestilence and war. In other words the signals are now all set red for danger, and if we all proceed down the rails at our present pace there is bound to be, by the middle of the next century anyhow, and most probably long before that, what is known as a "collapse" involving a huge reduction of the population of the world and an even greater reduction in the standard of living of the survivors.

When I was helping to negotiate the Charter of the United Nations in San Francisco in 1945, I made friends with a gloomy but highly intelligent and amusing Soviet legal adviser called Golunsky, subsequently, I believe, deceased. Even then he seemed to be suffering from some incurable disease, so his outlook was, not unnaturally perhaps, pessimistic. According to Golunsky, the human race was the equivalent of a highly noxious bacillus or fungus battenning on, and thus destroying, "nature". This bacillus, by some inscrutable decree of providence, had now got the upper hand and was no longer as in the past existing with "nature" in a state of symbiosis. Already it had produced enormous deserts in which nothing grew; soon

there would be many more. Already (1945) the great industrial conglomerations were becoming centres of poison and pollution; soon concrete would cover most of the countryside.

Happily, before the human race succeeded in utterly destroying "nature" it would no doubt destroy itself. One day it would, presumably, run out of foodstuffs. And then there was always the possibility of a plague. It was just before the explosion of the first atomic bomb in which the Professor might well have placed considerable hopes, had it not been perhaps regarded as a fresh symptom of the assault on "nature". Anyhow, there is no doubt whatever where my friend would have stood on the issue of "zero growth". Naturally these views were advanced in the course of conversation partly for the purpose of stimulating discussion, and no doubt also of demonstrating that some Russians were still capable of non-ideological debate! But even then we had an uneasy suspicion that Golunsky might be right.

It is not, therefore, for a Golunskyite to cast doubt on the various "models" or projections of the Club of Rome, though I believe there are great experts who do so. Let us suppose, rather, that they are incontrovertible—and indeed it is obvious, in a general way, that as we near the stage when there is standing-room only, the human race, like a proliferation of bacilli, will indeed out-run its means of subsistence and, additionally, be poisoned by its own excreta. We hardly need "models" to demonstrate this sad fact. Were there no physical checks on their expansion, there are, no doubt, many other species which, in a few generations, would cover the entire surface of the globe. Yet even so, even granted that we are now heading in this general direction, is it not possible to imagine that the "collapse", when it occurs, will not be global but rather partial, or regional?



## A will to survive

For instance, let us suppose (always given that nuclear war is avoided) that the necessary minimum restraint on (a) population, (b) pollution, and (c) industrial production, coupled with measures to increase the locally produced food supply, are taken by some act of will in the next ten years by the big industrialised states, or by only one of them or by some of them working together. Could not many hundreds of millions then survive a "world" collapse perfectly well—and incidentally materially reduce the global pollution of the atmosphere and the oceans—by developing a kind of "autarkic" policy, even at the expense of world trade and world communications and (to some extent, no doubt) of their own "standard of living"? In other words, however undesirable, as such, this may be, is it not possible—and even likely—that the under-developed countries will, in default of solutions of their own imagining, be left to solve their own population problems by the "natural" means of starvation, disease and intensive civil war—Bangladesh, so to speak, after Bangladesh? Naturally, no humane or civilised person could possibly desire, still less recommend, such a solution, or do anything but seek to avert it; but if it occurred by the force of things, what then? Would it necessarily, I repeat, imply the "collapse" of the industrialised states—or some of them? Are the latter inevitably, in other words, at the mercy of the less advanced societies? Let us take the present groupings of the industrialised states themselves and consider them individually.

In the *Soviet Empire*, extending from the Elbe to Vladivostok, there is surely little reason to suppose that there will necessarily be an unmanageable, still less an "exponential", increase in the population between now and the middle of the 21st century. Conditions in the Communist states are at the moment so unpleasant by Western standards and so difficult for young married couples that any great increase in the towns seems highly improbable. Nor is there much reason to suppose, in spite of the recent agricultural disasters largely attributable to the appallingly inefficient Soviet system of farming, that the food supply will be insufficient to support such an increase in the population as may take place over the next 100 years. Vast additional areas are,

after all, still available for agricultural development on sensible lines. It is quite true that, if the process of industrialisation continues at its present rate, certain raw materials in the Empire may then be in short supply and that the pollution may also exceed tolerable limits. We are told that the Volga is now a sewer; that Lake Baikal will soon compare unfavourably with Lake Erie; and that the polluted Caspian is rapidly drying up. But assuming that the "Empire" continues to exist (which is by no means certain) is there any particular reason to believe that the necessary means will not be taken by the 400 million people concerned to correct these tendencies even if they have to adapt themselves to a rather different form of social order in the process? The "standard of living", as we now conceive it, might decline, but would this necessarily involve a "collapse" of civilised life, involving widespread anarchy and mass starvation? I doubt it. There are not many internal combustion engine passenger cars now in the USSR and there need not be very many more in AD 2000 when progress will probably have been made towards electrical traction. Besides, the Soviet Union has a fairly ruthless administration which will presumably continue to compel the uncomplaining Russian masses to do what they are told to do however much they may dislike it.

## The Chinese quarter

Then take *China*, an almost totally "unaided" country which by itself accounts for nearly a quarter of the entire population of the world, and

between a third and a half of all the "under-developed" nations. As things are, it does not look as if, there at least, the population would tend to outstrip the indigenous food supply, even in the coming century. Checks are even now, I believe, being imposed on population growth (eg men are forbidden to marry before they are 30) and the land available for agricultural production can be considerably extended. Besides, there seems little reason to suppose that the Chinese Government is unaware of the long-term dangers inherent in the "Western" way of life, whether as regards pollution or as regards the appalling waste of essential raw materials. So it may well be that, for China at any rate, we could draw up a "model" which would represent a more or less stabilised society in the year 2000. And this "model" might well continue to be largely isolated from the rest of the world. China, after all, is China and for thousands of years was more than content to be so isolated.

We come to *Japan*, with which the Western World is at present closely associated owing to its whole-hearted acceptance at the end of World War II of the philosophy of "growth" with all its deplorable long-term consequences so graphically depicted by the Club of Rome. Yet if any country is capable of restricting its population by an act of will it is no doubt Japan, which did so—by fairly crude methods it is true—for many centuries. And if Japan does break with the West—as indeed she may—it seems quite likely that she will be closely associated with China and no doubt accept the basic Chinese



philosophy regarding growth, even if it comes to abandoning the motor car and taking to bicycles. Moreover, should the Japanese control their population by drastic means, might not they continue to be largely self-supporting in foodstuffs?

In the industrialised world there remains *Atlantica*—ie North America, Western Europe and Australia, all associated by intimate historical ties. This is really where the political problem principally resides, more particularly, of course, in the United States. This is where the industrial revolution has reached its culmination and where it will undoubtedly destroy itself—and perhaps all of us (owing to the progressive pollution of the sea and the air and the exhaustion of most raw materials) if it is allowed to proceed unhindered. For as things are, it is chiefly North America which is devouring the resources of the planet at an “exponential” rate, though “Europe” is admittedly fast catching up. The population of Europe and the United States is not, however, increasing at a rate which threatens to exhaust its own food supply, since both could produce much more than they do. The real danger, therefore, seems to be that in their race to advance their “standard of living” they—and more particularly the United States—will insist on stepping up industrial production to the point at which it may fairly shortly by itself exhaust the world’s resources of at any rate certain raw materials, and at the same time irremediably pollute the atmosphere, the rivers and the sea.

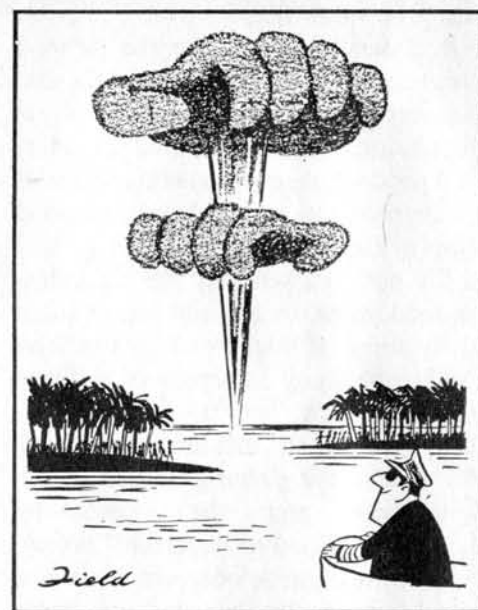
### A lead from Europe ?

However, even if the United States finds it difficult to check this clearly irrational rush to destruction it is possible that a United Western Europe may give it a lead, and indeed, Europe may be forced to give a lead since the prospect of being partially cut off from world raw materials, and (whatever relief may be afforded by the North Sea and the use of atomic energy) notably oil, may well result in its having to fall back on a joint “autarkic” policy rather sooner than many suppose. Be this as it may, if, as many tell us, large areas in the under-developed countries will soon be a prey to anarchy and civil war, it is quite clear that not even the United States will be able to maintain indus-

trial production at its present rate, for the simple reason that, unless it sends military expeditions to the areas affected and takes over the supplies itself (which after the Vietnam experience seems rather improbable), it will hardly have the wherewithal to over-produce. In other words, industrial production in the United States is likely to begin to run down anyhow. Which brings us on to the “Third World”.

Here, as I said at the beginning, the chances unfortunately seem to be that, in default of a quite improbable “aid” in adequate quantities, and equally improbable attempts successfully to reduce the increase in population, the industrial process will not achieve anything like an “exponential” rate, which in its turn will mean that the 1,500 million people concerned will not be able to maintain their greatly increasing population and that a “collapse” of the order indicated by the Club of Rome will probably soon occur. Even if it does not occur and by one means or another the Third World (minus China) does manage to industrialise itself, this will, in default of a sharp check on population, merely add to the sum of world pollution and no doubt to the world collapse foreseen by the pundits. Certainly there is small likelihood of the impoverished Third World’s agreeing to check pollution at the expense of production. Difficult enough in North America, it would be out of the question in vast areas (such as Brazil) where the one, even if unacknowledged, ambition is to be as rich, and, in general, as much like the United States as it is possible to be.

Can the industrialised states of *Atlantica*, however, themselves take the necessary steps to avoid disaster? In principle it looks as if a “benevolent” dictatorship has a better chance of inducing industrialised states to accept the disciplines necessary if the ominous curves on the graphs of the experts are going to be bent to any noticeable extent. Must we thus assume that the only motto suitable for a democracy will be “*vivre libre et mourir*”? Must we assume that unless Western Europe can shortly agree on some acknowledged authority it will have to be developed as a series of small “directed” economies that will inevitably, in the long run, come under the influence of the Soviet Union? Perhaps. But the hope for us in Western Europe must be to work out in a democratic way, with



the aid of the Commission and a Parliament, a sensible long-term policy based on (a) an estimate (given a general will to encourage restriction) of the likely population of the Community by the end of the century; (b) the extent to which the Community can exist on its own resources (offshore oil and gas, nuclear energy, home-grown food, etc) even at some prejudice to the standard of living; (c) the extent synthetic raw materials should be developed on the assumption that their natural counterpart may not be available before long from overseas; all coupled with (d) the preparation of a scheme for reducing pollution which would be financed by all the partners and might involve some restriction on the continued over-production of, eg motor cars.

So the non-specialist might perhaps reach the following conclusion. The neo-Malthusian prophecies of the ecologists and the anti-pollutionists are no doubt irrefutable as a general long-term proposition, but in all probability they will not fulfil themselves in any general way. Before the increasing prospect over the years of a reduction in the standard of living of the rich and a threat to the very existence of the poor, the nations are likely to react in an individual or (at the best) a regional, rather than in a global manner. Depressing though the thought may be, it must be apparent that unless they are forced to do so by some immediate crisis, the various national governments, insofar as they remain entirely independent, will not take more than palliative measures to head off the dangers predicted by the theorists and when they do they will hardly feel im-



pelled to think in global terms, but rather in what is likely to be the short-term effect on their own citizens. On the other hand, the larger the industrialised entity the greater the chance of its taking the measures which are obviously required, for the simple reason that, by the very fact of its huge size and resources, a Super-State (or the confederal equivalent of a Super-State) may be able to live on its own without much regard for the unfortunate predicament of its neighbours.

### **Orwellian dictatorships?**

If, indeed, we are to be swayed by prophecies, what about that of the prophet Orwell who predicted that by 1984 (but of course it might be the year 2000) the Super States of Atlantica, Eurasia and Eastasia—all totalitarian dictatorships and all self-supporting—would be locked in a perpetual non-nuclear struggle for the control of what we now call the “under-developed” countries? This seems to me to be at least more likely than a total collapse of organised society throughout the world. If we want to be optimistic we may imagine that, even in such circumstances, the drain on world resources might be reduced by

consent between the three or four great protagonists, while the world population problem would no doubt by that time have solved itself by “natural” means.

The more general conclusion surely is that if the so-called “under-developed” countries, and notably these in the Indian sub-continent, do not wish to become a sort of *corpus vile* at the mercy of the big industrial complexes the broad remedy is in their own hands. If China—an under-developed country—is capable of averting an otherwise inescapable doom by controlling her population and her industrial production, why should not others in a like state follow her example? All they surely have to do is to adopt Chinese methods, even though this might involve breaking with the West, accepting the rule of a semi-divine leader, imposing stern disciplines, and, in effect, instituting closed economies. It is not to be imagined that such a process would be agreeable to the already industrialised powers—even to China for that matter—but, as I say, he who desires the end must also desire the means. If the industrialised states really have the good of the under-developed states at heart, as they say they do, they might have to put up with it.

I do not wish to exaggerate. No

doubt even if the Indians became “Chinese” in outlook, destroyed all their sacred cows, preserved all their silos against the depredations of sacred mice and rats, worked like beavers, forced their males to defer marriage till 30, went in heavily for labour-intensive projects, and so on and so on, in fact, even if some efficient totalitarian system was established south of the Himalayas, there would no doubt be some exchanges between it and the industrialised countries, albeit, no doubt, on a diminishing scale. But at the moment nothing seems more unlikely than such developments as these and it is thus reasonable to assume that the chances are that nature will, during the next two or three decades, take her course and that war, disease and starvation will at once reduce very substantially the population of the “Third World” (except maybe in some of those countries which are maintained by selling oil to the already industrialised states) and at the same time, by severely reducing world trade, force the industrialised states—and in the first place America—to adopt “autarkic” methods of production that will in themselves go a long way to producing a satisfactory “model” for the theorists of the Club of Rome.

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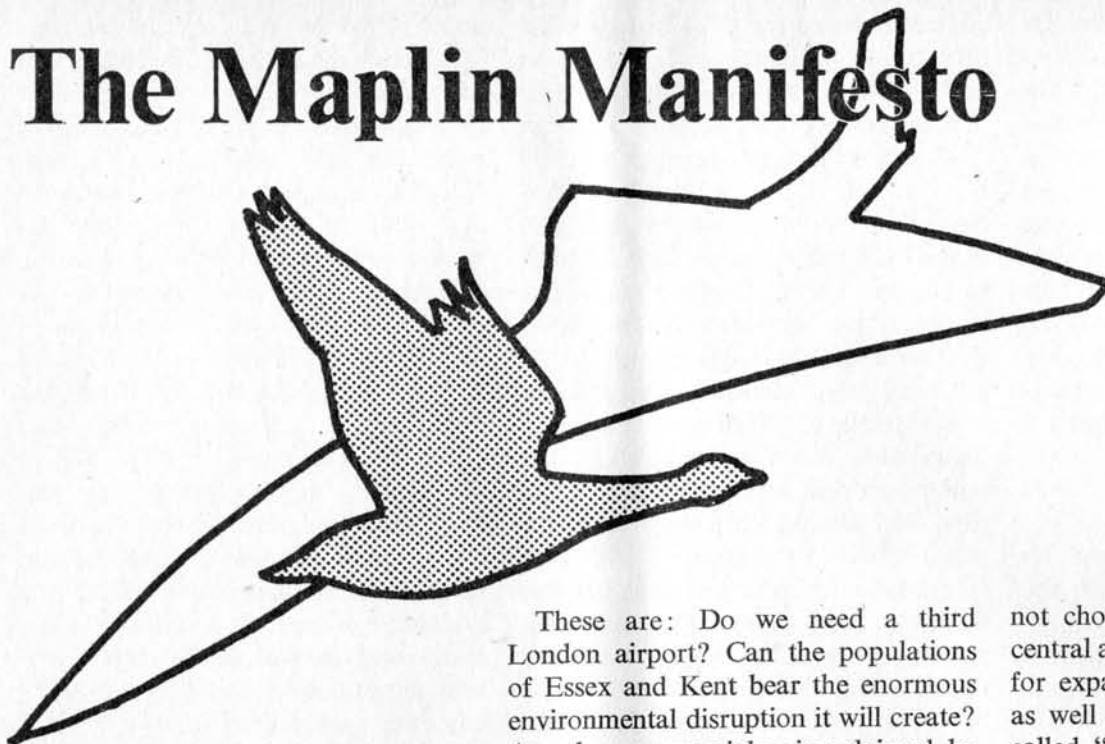
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# The Maplin Manifesto



The campaign against the Government's plan to construct a third airport for London at Foulness and to associate this development with a port, an oil terminal and a new city, has won wide support.

This article is an abridged version of the campaign manual that has been produced by the Anti-Maplin Campaign and published by Essex Friends of the Earth. It is intended to be used as a base for protest. Copies of the full Maplin Manifesto may be obtained from the Anti-Maplin Campaign, PO Box 65, Chelmsford, Essex.

Britain is currently in the grips of a severe economic crisis which seems likely to affect the future of every man, woman and child in the land. In the light of this crisis, the Maplin Manifesto has been drawn up to examine the Government's stated intention to build a third London airport at Foulness, Essex.

Published details of the plan—which includes a port terminal for shipping and a new inland city for about 250,000 people—show that it will be a development without precedent in terms of scale and expense. Yet, in our view, the planners have given scant attention to fundamental questions which should have been answered before the project was put into motion.

These are: Do we need a third London airport? Can the populations of Essex and Kent bear the enormous environmental disruption it will create? Are the commercial gains claimed by the plan's advocates sufficient to justify the vast investment of real resources it will require?

## Do we need a third London Airport?

To ask this question so long after the idea of building another London airport was first mooted seems ridiculous. How could successive Governments backed by the best Civil Service brains proceed through interminable debate and inquiry if the need was not obvious? Certainly the need appears at first glance (particularly if one lives near Heathrow) hardly worth discussing. In fact, it was *assumed*.

The assumption of the need was emphasised by Dr John Adams of University College, London, when he addressed a meeting of the Royal Geographical Society on 3 May 1971. Adams quoted from the Roskill Commission report on the proposed third London airport.

Roskill said (Vol. VII, p. 103):

"No attempt is made, or could be made, to quantify the total benefits accruing to the travelling public and the country as a whole from the operation of each individual site (Cublington, Thurleigh etc—MM eds). To set against the net costs for each site (assessed in the cost-benefit analysis) *there is what might be termed a 'base load' of benefits, not measured, but for the existence of which it would be wrong to proceed with a third London airport at all.*" (our emphasis)

Although Roskill, apparently, did

not choose to examine it closely, the central assumption upon which the need for expanded transport facilities (road as well as air) is argued, rests on so-called "passenger demand". Passenger demand has grown dramatically since the development of the internal combustion engine and forecasts of continued growth are the trump card with which road and air "experts" seek further resources for the systems they engineer. But is passenger demand what it appears to be? Adams asks the startlingly simple but apparently overlooked question: Which comes first, the chicken or the egg?

He notes:

"... in the 15 years between 1953 and 1968 the average number of miles travelled per capita in this country by all modes of transport approximately doubled, increasing from just over six miles per day to just under 12. Forecasts of air and surface traffic suggest that this trend is continuing and that a further doubling at least will take place by the end of the century. . . . Conventional wisdom still views the above evidence of rapidly increasing mobility as, in itself, a sign of 'progress'."

The Roskill Commission, as the ultimate manifestation of "expert opinion" clearly took the view that not to cater for "passenger demand" by building new airports and motorways would be to *suppress* it. But "viewed from another perspective," says Adams "... these curves (the upward graph of demand) describe traffic increases that are generated by the provision of the facilities themselves. Whether a decision not to expand is viewed as a suppression of something that is normal, natural and right, or simply as a refusal to generate more traffic, depends





*Rich farmland will be lost*

largely on one's view of the benefits of more traffic."

Another consequence of increased mobility cited by Adams is a growth in the disparity between the rich and the poor. He refers to the "national average mobility indices". While, on average, the nation is becoming very much more mobile, the disparity between sectors of the population is very large and growing. Public transport services are declining and those dependent on them are becoming less mobile. Among those most affected are the young, the old and the poor.

In the view of the authors of this manifesto, the whole of Dr Adams' extensive paper could be reproduced here. It is the most powerful statement of the fundamental (and little considered) issues which should have been debated *before* Maplin was foisted upon us. But, for reason of space alone, we must move on.

For on the question "Do we need a third London airport?" there are important practical arguments which, incredibly when one comes to consider the expenditure involved, have also been given insufficient attention.

Dr Peter Bromhead of the University of Bristol, for example, recently produced a study which will immediately commend itself to environmentalists. He writes:

*"It looks as if we may be brewing the greatest folly yet at Maplin Sands."*

"The Roskill Report has already shown that Maplin is a bad site, unattractive to passengers, damaging to the environment, sure to disturb a vast population along its access route. The Government decided that all the other sites were even worse, and it is to be congratulated on this decision. But why did it not go back and look again at

the supposed need to build any airport at all? It is easy to see why it did not do this, but it is not so easy to approve the omission.

*"For 15 years Whitehall's conventional wisdom has insisted on the need for a third airport, and it is uncomfortable for an administrative machine to question its own dogma."*

Bromhead suggests that there is still time for some simple calculations "before we blindly commit a billion pounds to Maplin Airport and tear down a corridor through Essex to reach it".

He notes that when Mr Noble, then Minister for Trade, introduced the Roskill Commission report to the House of Commons, he said it led him to "question seriously the possibility of doing without a third London airport" (*Hansard*, 4 March 1971, col 1914), yet, says Bromhead, "there is no evidence that anything of this kind was done".

"On the contrary, there is ample evidence that the government machinery was determined to have no truck with any such stuff as this; that it had identified itself with the need for a third airport, and regarded any evidence against it as an irritation to be brushed aside."

The evidence which Bromhead seeks to bring to the public's attention bears on the fundamental assumption that the third London airport is needed because of the growth of air traffic using London and projections of future demand. Expressed simply, his argument is that insufficient thought has been given to *factors which might reduce the growth of London's traffic*.

Two new factors which could reduce the London airports' passenger load are, he says:

"Action to rationalise the distribution of demand among existing airports using spare capacity, or, if you wish to call it this, a national airports policy.

"A decision to build a Channel rail tunnel and to exploit the railways' new potential to the full."

### **The environmental impact of the Maplin decision**

Maplin has been described as the first "environmental" airport. Much of the credit for this remarkable designation should go to Professor Colin Buchanan who revealed that he regarded it as the most desirable of the alternative sites on environmental grounds, in his note of dissent to the Roskill Commission report. Since then, the town planner extraordinary has become Professor Sir Colin Buchanan.

In case the people of Essex and Kent should seek to gain comfort from Sir Colin's words, it is worth recording that the professor has also described airports as "hideously undesirable neighbours".

Sir Colin said:

"I sometimes have my private doubts about whether air travel as such is really the benefit that it is claimed to be. You may have noticed that in Volume VII of the (Roskill) commission's proceedings there is a chapter called 'The Value to the Nation'. I was always a bit confused and bewildered about it. I kept asking myself, well—all right, everyone wants to travel by air, but what really are the benefits which air travel brings to the nation as against the costs that are imposed?

"I always had in the back of my mind the thought that there might well

have been a fundamental cost-benefit analysis which we never undertook.

"I had a curious indication of this recently. I happened to be in Cyprus, and the planning people in Cyprus took me to Famagusta at the Eastern end of the island to see the water-front there and waited for my reaction. I very nearly exploded at what I saw because I think it was the worst example of the exploitation of a foreshore that I have ever seen in my life. There were tall, parallel blocks of apartments edge on to the sea, with a gap of about 9m between them. Many of the apartments would simply look straight into the apartment in the opposite block. Then I poked around a bit more and what did I find? I saw an estate agent's board for the sale of these apartments. And it was English people who were buying these apartments. Then it suddenly clicked back to London airport. During our investigations (of the Roskill Commission) we were told time and time again that the great thing for the future was expansion of the leisure travel market. *As a result, I thought, we were asked to agree to a major rape of the English countryside for the promotion of leisure traffic in order that people could go and join in a major rape of the coast of Cyprus, and, for all I know, of Malta and Bermuda and a good many other places around the world.*

"So while I do not really depart from my colleagues in agreeing that there is a need for more airport space in the South of England, I sometimes have this residual doubt whether we really got to grips with the benefits and costs of air travel to the nation."

Let us consider what the arrival of Sir Colin's "hideously undesirable neighbour" is going to mean.

### The airport complex

The airport and associated sea port, with light industrial and commercial development, are to be sited on 25 square miles of reclaimed land. Material for reclamation is being dredged from the sea bed to form deep sea channels to the port and then pumped on to the sands adjacent to Foulness Island.

The Government has announced that the four runways of the new airport will be at site C—1½ miles north-east of the Roskill preferred location. By choosing site C, the Government ignored the pleas of 75,000 people who

took part in a Southend postcard campaign urging the selection of site D, a further 1½ miles north-east, which would have reduced the impact of noise on surrounding areas.

Apart from the cost and land reclamation problems, one reason for the Government choosing site C was the fact that site D "would rule out any option for future access to the airport from the north". (Eldon Griffiths, Environment Under-Secretary, House of Commons, 9 August 1972.) Here, it is worth noting that Essex County Council has always opposed development north of the River Crouch.

The Roskill report stated:

"The disadvantages and environmental losses in the Foulness area must not be overlooked as they too often have been by some of the more enthusiastic supporters of Foulness (as the third airport choice). We again emphasise that one of the supposed advantages of Foulness—the deep water seaport and large industrial complex in addition to the airport—can in our view be achieved *only by major urban development north of the River Crouch* (Roskill, 6.84—our emphasis).

The first dredging and land reclamation is due to start this year and the first runway to open in 1980.

A key feature of the Maplin plan is undoubtedly the port and oil terminal. The Port of London Authority claims that it will be capable of handling "the largest container ships of the future".

The first stage of the oil terminal—costing about £35 million—is planned to comprise one or two jetties, buffer tank storage facilities and a pipeline network to existing and planned Thames-side refineries. According to the PLA, the terminal will eventually cater for 500,000 ton tankers. The environmental implications of such massive oil movements are well known.

### Jet City

In 1967 Essex County Council claimed that Foulness was sufficiently near to Southend and the Essex Thames-side to need no new industrial and population growth point (Brigadier T. F. J. Collins, chairman of the County Planning Committee, speaking to MPs on 20 June). In August 1972, Environment Under-Secretary, Mr Eldon Griffiths, told the Commons: "Maplin will create a need for large-scale urban development in South East Essex... The Government propose to designate

a substantial area for development by a New Town Development Corporation." Despite the fact that the Minister's statement contradicted the position earlier taken by Essex County Council, the council did not object. The site of the new "Jet City" will probably be announced early this year.

Since the Minister made his announcement, there has been a fair amount of speculation about the location. Partly, this has been due to contradictory statements made by the Minister himself.

In the Commons he said that the city would be in South East Essex, but at a subsequent press conference he announced that it would be in Mid-Essex (*Daily Telegraph*, 10 August 1972). Had the Minister let the cat out of the bag? Are we excused for accusing Whitehall of deviousness? Also during the press conference Mr Griffiths was reported to have said that the new city would have a population of 250,000—five times as large as the county town, Chelmsford—and that it would be at least 15 miles from the airport.

One could dwell at some length on the environmental and social implications of jet city. Suffice to say, however, that it is clearly going to be planted in the middle of a rich agricultural area when the costs of imported food to Britain are continually rising. *And it is going to involve even more investment in the already affluent South East while Britain's peripheral regions—for years promised a fair deal by successive politicians—run further into despair.*

### The communications network

"We believe that the existence of two new motorways must add to the problems of creating a satisfactory urban environment in South Essex." (Roskill, 10.59.) So, with a mastery of understatement, said the Roskill report.

It is clear that the access routes to Maplin Airport will have as much impact on Essex as the airport itself. Homes will be destroyed to make way for them—probably, when one comes to consider the population density of metropolitan Essex, in their thousands. And the households which remain will be subjected to a heavy burden of road traffic noise and pollution.

Most people's experience of motorways is the satisfaction gained from being able to drive quickly from point



A to point B. It is an even more pleasant feeling if one retains memories of the traffic jams along the winding road which joined A and B before. But, unfortunately, motorways cannot only be viewed from the comfort of a car. A growing minority of people have to live near the things.

Whitehall, in its usual reticent manner, has so far (at the time of going to press) given away little information about the proposed Maplin routes. But it is generally accepted that a six or eight lane motorway and a new rail link will be constructed before 1980, with a second motorway later. If the main motorway and the railway run together, as seems probable, they will require a swathe of land 200 yards wide.

A further motorway, incidentally, is likely to be constructed in Kent—with access to the airport via a new Thames crossing.

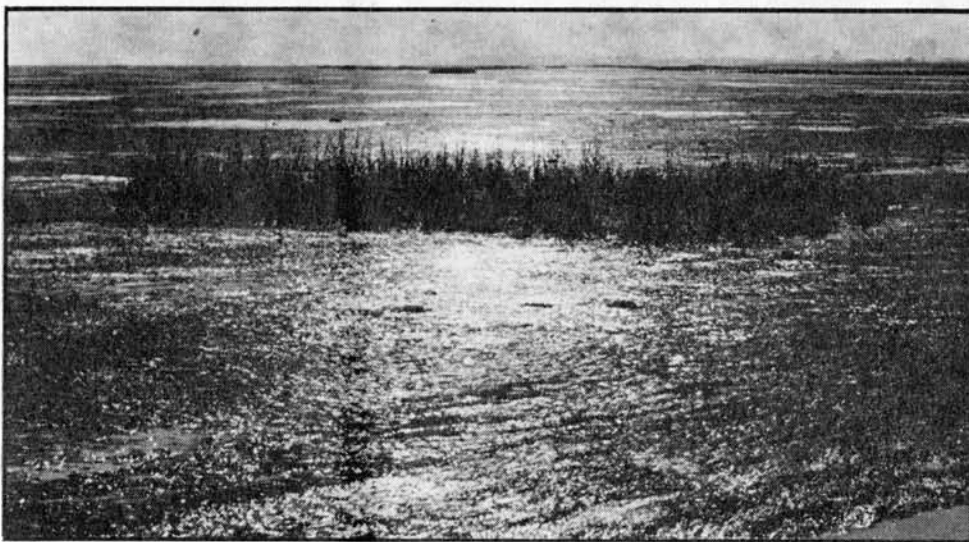
Roskill had this to say:

"Foulness has the advantage that the earlier provision of new roads to the east of London to meet the needs of the airport is likely to do less environmental damage to rural areas than the corresponding provision of new roads to the north west of London to meet the needs of an airport at either Cublington or Thurleigh (measured by cost benefit analysis, presumably—MM eds). But a second new motorway will be required sooner in the case of Foulness than in the case of both Cublington and Thurleigh. *The roads required in the South Essex corridor are likely to do damage to urban areas on a scale which will not occur in the corridors between London and either of the inland sites.*" (Roskill, 13.23—our emphasis.)

## Agriculture

Although this section of the manifesto is devoted to the local environmental disruption likely to be caused by the Maplin decision, the agricultural implications should be a national concern. For years the National Farmers' Union has been calling attention to the rapid erosion of fertile farming land with the advance of the urban sprawl.

The land over which the Government is proposing to pour millions of tons of concrete is richly productive. It is 10 times more productive per acre, for example, than the land around Cublington (*New Statesman*, 26 May 1972). With world population exploding (the issue ignored by Lord Watkin-



*The mudflats are a rich habitat*

son, but explained in brilliant and chilling detail by Georg Borgstrom in his masterpiece, *Too Many*) the time is rapidly approaching when Britain will once again be forced to rely on home-grown food. Every fertile acre will be precious to us.

## Water resources

Essex is already facing a water shortage and a giant Ely-Ouse scheme has been evolved to divert water into the county from the north. This problem has been partly ameliorated by the discovery of underground water sources in Suffolk, but, in our view, insufficient attention has been given by the Government to the implications of the big extra demand for water thrown up by the Maplin proposals.

## The danger of flooding

There has so far been little public discussion on the extent to which Maplin land reclamation will effect tidal movements. The go-ahead for the costly Thames Barrier scheme has been given because the combination of high spring tides and strong winds funnelling into the Thames estuary can produce a London flood threat.

Once again, we believe, the Government has given insufficient thought to the problem. Coastal barriers are being improved—to protect against the reflected wave from the Thames Barrier, but the effect of diverting the high spring tide from Maplin into the River Crouch will be considerable. People living in South East Essex, particularly Burnham-on-Crouch, should be demanding assurances from the Government that all these potential dangers will be adequately studied before reclamation begins.

## Bird strike

Our friends the Defenders of Essex have rightly emphasised the Government's apparent disregard for the problem of bird strike. It has been decided in high places that the ancient name "Foulness" should become "Maplin"—presumably because jet-age travellers would be deterred by something defined in the dictionary as offensive to the senses, stinking and loathsome.

The deference to modern attitudes may ultimately come to be regarded as an inexcusable fraud—for Foulness was so named because of the water fowl which have congregated there for centuries. The airport is to be built under a major bird migration route—a crucial factor which the name change to Maplin neatly erases from the public consciousness.

## Our natural heritage

In our view, earlier arguments against the use of Foulness for an airport have over-emphasised the issue of the fate of the Brent Goose. We believe the ornithologists who say the arrival of the geese, after their long migratory flight from Siberia, is one of the great sights of nature. The trouble is that such experiences are only enjoyed by a small minority. By emphasising the ornithological loss of building the airport at Foulness, opponents of the plan have played into the hands of the other side. The issue became people versus Brent Geese and the "Stick it on Foulness" lobby scored heavily. As we hope we have already shown in this document Brent Geese will not be the only victims if the airport is stuck on Foulness. The people of Essex and Kent and the taxpayers of Britain stand to lose a lot too.

That said, however, we acknowledge that the preservation of this country's natural heritage is no minor consideration. As ornithologist and anti-Maplin Airport campaigner, Dr W. R. P. Bourne, puts it, the Foulness area is "a unique fragment of the British coastline, miraculously left unspoilt within 50 miles of London, which moreover possesses outstanding possibilities for development as a nature reserve".

### Can Maplin Airport be justified commercially?

As has been stated frequently elsewhere, Maplin was not thought a suitable site for the third London airport by the Roskill Commission—experts appointed by the Government. Neither is it favoured by the airlines.

Both positions are taken for hard commercial reasons. The arguments against the Maplin site are so powerful and compelling it is hard to see how they could have been rejected by the Government.

We consider that Dr Peter Bromhead's remarks, quoted earlier, about Whitehall's "conventional wisdom" insisting for 15 years that a third airport is needed, provides a clue. There are strong pointers to suggest that, as with Concorde, there is an element of entrepreneurial risk-taking in the decision.

Before we, the British taxpayers, stand back and watch our money being poured into the Foulness mud, should we not consider the Concorde record? The original estimate of the development costs was £150 million to £170 million. Now, 10 years later, £670 million has been spent and the estimated *future* development costs stand at £300 million.

Secretary of the Anti-Concorde project, Richard Wiggs, says:

"Faced with these facts, what can one say of the original estimate? Was it grossly incompetent? Or was it based less on the likely cost of developing a supersonic transport than on the necessities of gaining initial political support?

*"Whatever the explanation may be, the prodigious costs overrun on the project has left its sponsors with a big credibility gap."*

Professor John Jewkes—formerly Professor of Economic Organisation at Oxford—completes the picture nicely in a paper just published by the Institute of Economic Affairs (Government and High Technology) in which he asks:

"Why have successive British governments spent such large sums on the encouragement of high technology—which for practical purposes means nuclear energy; aircraft, especially the Concorde and the Rolls-Royce RB-211 engine; and computers?

"The sums involved have been considerable even for these days of casual public prodigality. The cost of the development comes to well over £800 million. The development costs of the Concorde shared between the British and French governments have risen to about £1,000 million. The cost to the Government of the RB-211 has amounted to about £150 million. Government has already made available for research and development on computers some £28 million, and the final bill is expected to be four or five times larger. *So far the returns on these sums have been very disappointing, some would say derisory.*" (our emphasis)

Professor Jewkes defines these projects as high technology—meaning high risk technology—which private companies "in close contact with realities" would not give their support to because the chances of profit seems too small, "but where Government, for one reason or another, feels that it knows better".

Why do governments feel justified in risking the taxpayers' money? Professor Jewkes suggests that the reason is fear:

"... the fear on the part of an industrial country with a high standard of living that, with the steady spread of industrial expertise throughout the world, its own comfortable ways of living will be endangered by the competition of poorer countries."

Such fears, he says, are "understandable, highly contagious and largely without foundation." (our emphasis) He explains:

"The obvious fears of statesmen in these days that technical advance in civil industries will not be fast enough without massive government intervention have many sources. Politicians personally often appear to be fascinated by the more dazzling technical devices which make the headlines in the newspapers.

"Lord Beeching has commented that: 'I think (the British Government) has wasted an enormous amount of money on things justified by the pursuit of advanced technology—an almost childlike desire to play with toys.'" (The Expenditure Committee, Vol. III, p. 457.)

In our view, Maplin is another prestige project which reflects more on the politicians' desire to boost their egos than on commercial considerations of national interest.

For those who remain unconvinced—and it is certainly hard to believe that successive governments could have been so wrong for so long—there remains a final clinching argument which appears to have never entered the minds of our Civil Service planners and technical advisers.

Both the vastly expensive motorway construction programme of the last decade and the present airport expansion programme assume that recent rates of growth of air transport will continue for many years to come and that the public "demand" *must* be satisfied, whatever the cost.

Dr Adams has already successfully shown, in our view, that these growth patterns are subject to the chicken and the egg analogy. Whether faster and cheaper overseas travel are worth more to society than the cost of providing them is still a matter of opinion. *But what cannot be disputed is that the assumption of continued traffic growth is quite wrong.*

The reason it is wrong is so simple that we are surprised our politicians and their advisers have not seen it. *The assumption of continued and expanding growth of air and road traffic depends above all on stable oil prices.*

*If the cost of oil—and therefore petroleum—should suddenly and dramatically increase, those miles of motorway and tarmac airstrip in which we are currently investing will just as rapidly become redundant.*

It is interesting to note that the Government—reportedly on the advice of the Rothschild "think tank"—has recently become aware that we are facing an energy crisis because of an imminent escalation in the price of oil. This was undoubtedly the explanation for last December's sudden injection of a cool £720 million into the ailing British coal industry despite the Government's election promises about not helping "lame ducks".

### Conclusion

*The British public does not need a third London airport, cannot afford to build a third London airport and, if it could anticipate the environmental consequences, would not choose to have a third London airport.*



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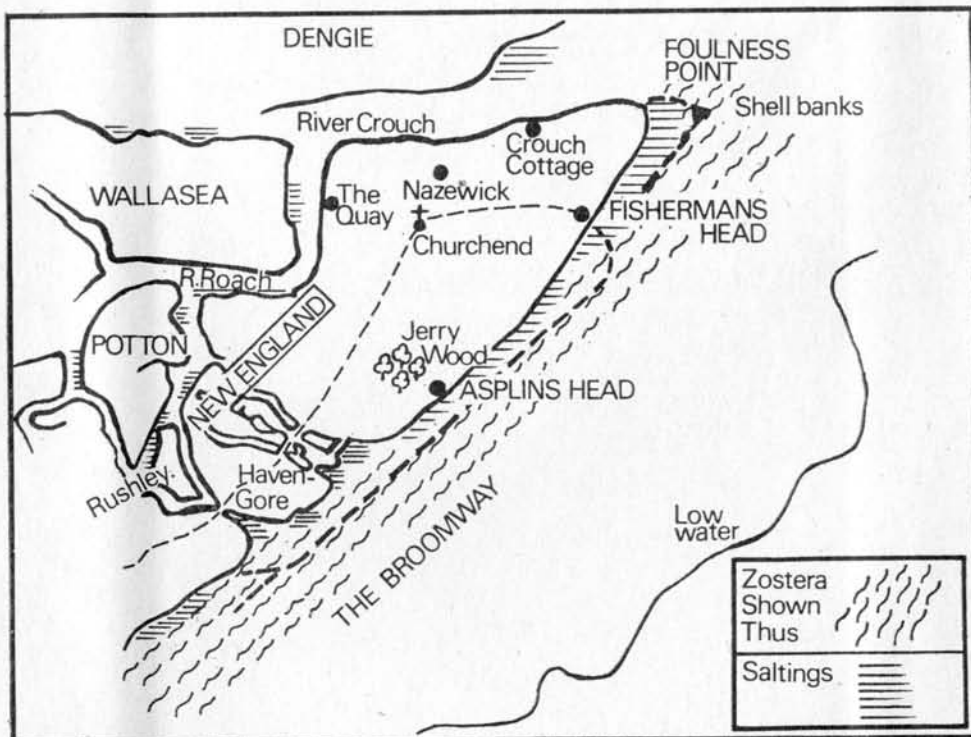
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# Foulness: wildlife and the airport

by Mollie F. Drake

The proposed site for London's third airport is rich in wildlife. It could be made into a refuge with viewing facilities equal to the best in the country. It is also excellent farm land. If all this is to be lost, then we should know what we are losing. This article explains the value of Foulness to ornithologists.



Projecting into the North Sea at the tip of S.E. Essex lies Foulness Island, the focal point of a complex of estuaries, marshes, mudflats, creeks and islands extending from Canvey Island and Leigh in the Thames Estuary, through Shoeburyness, past Maplin and Foulness Sands, the Roach and Crouch Estuaries and the Dengie Flats to the Blackwater, Colne and Stour Estuaries. Its name, meaning the "promontory of the wild birds" and derived from the Old English *fugla-naess* or "wild birds' ness" is still apt today.

Because the Ministry of Defence acquired Foulness in 1915 this wonderful area has remained safe from development. Much of the land is farmed, it is among the most productive in England. The yield for wheat and barley is well above the national average, excellent crops of beans, peas, and mustard are grown, and quantities of beef, mutton, and wool produced.

Access is restricted to residents and their visitors, people employed there, and those issued with passes for special

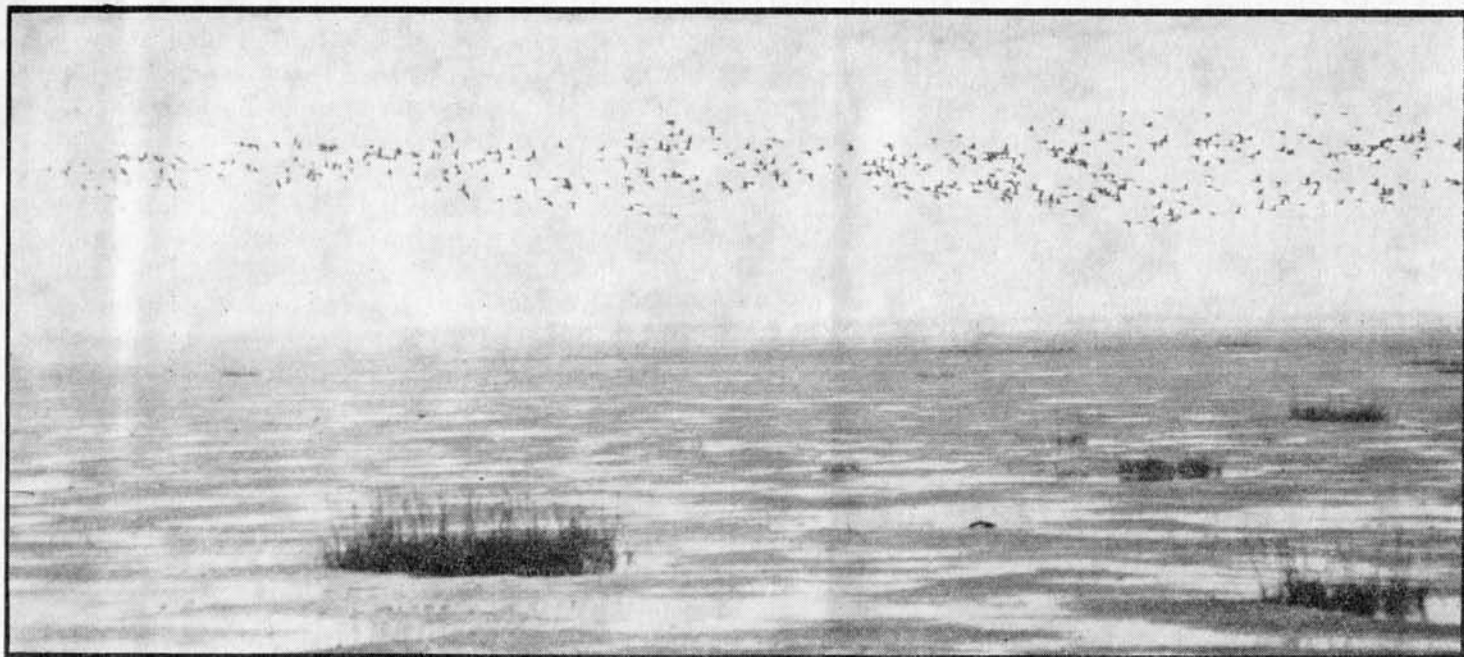
purposes. Birdwatching passes are allowed for eighteen people to take part in the International Wildfowl Counts, once a month during autumn, winter and spring. On these days observers in groups of two or three spaced round the coast of the Foulness area during a three-hour period, on an incoming tide if possible, note and time the birds seen, geese and other wildfowl, waders, migrants, resident birds, and anything else of interest.

Over the years, by using carefully worked out methods of counting and collating the results a picture of the wildlife has been built up, comprehensive but not complete, as some areas are "out of bounds" to us. Wildfowl Count figures are added to the Essex totals, then sent to the Wildfowl Trust at Slimbridge for inclusion in national and international totals. Results are also included in the British Trust for

Ornithology Estuaries Survey, and breeding records will be included in the Bird Atlas to be published later. These records were of course of the greatest value when the Royal Society for the Protection of Birds submitted evidence to the Roskill Commission. At least 146 species have been recorded in the Foulness Havengore, Rushley, Wakering Stairs area, because of the variety of habitat.

Two features are unique. One is the biggest continuous bed in Great Britain of the marine flowering plant *Zostera*, the preferred food of the brent goose. This grows in a band roughly 400 yards wide for about eight miles on the mud just off-shore, from Foulness Point nearly to Shoeburyness. The majority is the small type, *Z. noltii*, with the larger *Z. marina*, previously growing there only as isolated plants, now increasing to sizeable patches. The





*Dark-bellied brents.*

other unique feature is the group of banks consisting almost entirely of empty cockle shells off Foulness Point, declared a Site of Special Scientific Interest by Nature Conservancy. The Outer Shellbank is the largest, about half a mile long. Between it and the saltings lies the Inner Shellbank, ever increasing in size and now becoming joined to it by a firm cockleshell causeway. Other shellbanks are developing along the edges of the saltings and showing signs of becoming one continuous bank all the way to Fisherman's Head. Both these unique features lie within the area proposed for the site of the Third London Airport (TLA). They would be completely destroyed by it. The Maplin Sands, which would also be destroyed by reclamation, are immensely rich in marine life of many kinds, particularly the cockle, two thirds of this country's supply coming from here. The only commercial bed of white-weed in Europe is here, its produce largely exported to the United States.

### **Rich habitat**

Along much of the shore are saltings, varying in width from a few yards to about 400 yards at their widest near Foulness Point. The seeds of the plants which grow there provide food for large flocks of green and goldfinches, linnets and skylarks, with smaller flocks of twite all through the winter. There is nothing remarkable about these plants but they belong to a habitat once typical of the Essex coast, offering food and shelter to a great variety of birds,

but fast disappearing. To this haven of refuge the coastal birds have returned each autumn for countless years in countless thousands.

During August, wader numbers build up as many species use Foulness as a staging post on migration and others arrive to over-winter, all finding the miles of mudflats exposed at low tide a rich source of food. Over-wintering numbers can include 8,000 curlew, 4,000 oystercatcher, 10,000 dunlin, 15,000 knot and 1,500 bartailed godwit. Many hundreds of redshank and golden plover are present with smaller numbers of grey and ringed plover and turnstone. Some hundreds of sanderling come through on autumn migration. Up to 200,000 gulls have been known on migration, with rather smaller numbers wintering.

In the autumn swallows, house-martins and sandmartins pass through, sometimes collecting in flocks of many thousands to feed before moving on. This year there was a tremendous concentration, mainly sandmartins, literally thousands, present for over a week alternately feeding over a field of mustard and resting on nearby stubble, packed "like a swarm of bees" as one farmer put it. Later in the season the night sky will be full of the calls of incoming redwings, fieldfares and blackbirds flying high as they pass over Foulness to continue their flight inland, although many will drop off to feed there.

When the dark-bellied brents arrive in autumn, the *Zostera* is at its best, the

luxuriant growth covering the mudflats. The geese eat their fill quickly and easily, then fly out to the tide edge remaining there for long periods. Later, as the *Zostera* is depleted they spend more time closer inshore. They supplement their diet with alga *Enteromorpha* but are thought not to do so well on this as it has a lower protein value.

Sometimes they "march on the spot" as do gulls, seemingly to disturb small creatures in the mud for food. At high tide they swim, sometimes upending to continue feeding. With such a vast feeding area, if disturbed at one point they do not have to fly far before they can continue feeding, thus conserving energy. Towards the end of the winter, or earlier if severe frost damages the *Zostera*, some will graze on pasture near the sea, but these are small flocks, numbered in hundreds, compared with the thousands off shore, a sign of dangerously depleted supplies, I feel, rather than a willingness to turn to alternative food.

### **Reclaiming the feeding ground**

The proposed reclamation of this feeding ground, threatens the very survival of this race of birds. When wildfowl counts first began there was serious concern for their status. In the early 1930's *Zostera* was severely depleted by disease over much of its range, and at the same time, the world population of these birds, deprived of their main source of winter food, decreased sharply to about 16,000. Some of the *Zostera* beds gradually recovered, the

brents were given legal protection, and slowly their numbers built up to stabilise at around 30,000. This figure was exceeded following two good breeding seasons in 1969 and 1970, but an almost complete breeding failure in 1971 offset the improvement. At least one third of their world population over-winter off the Essex coast, most within the area which would be affected by a TLA at Foulness. Peak numbers at Foulness itself are normally about 7,000 in November each year. In November 1970 however, 8,500 were counted there, with another 5,500 at Leigh Marsh a few miles away. The Essex total that month was over 18,000, the previous highest being 12,000.

In winter at least 5,000 duck are present, mainly wigeon, with many mallard and shelduck, and smaller numbers of tufted, pintail, pochard, teal and shoveler. Common and velvet scoter, eider and redbreasted merganser are sometimes seen. The wigeon, which also eat *Zostera*, can be seen in large flocks on the shore, or swimming on the sea or creeks. They fly inland after dark. A few years ago a flock of 6-8,000 was seen to fly in to a creek off Rushley. Mallard and shelduck divide their time between sea, shore, creeks and pasture.

### Watching from the seawalls

The seawalls offer good vantage points from which to observe the movements of these birds. At low tide the brents will be feeding, and gulls dotted about on the mudflats, but the waders will be out of sight until the tide forces them in, when the mudflats are alive with the birds feeding ahead of it. Flocks of oystercatchers stream past on their way to their high tide roosts on the shellbanks. As the tide nears the lastings waders in hundreds or even thousands mill about seeking the highest points still exposed. When even these are covered, at several points on the coast there is a spectacular fly-past as waders by the thousand, curlew and godwit, redshank, knot and dunlin, stream in over the seawall to roost on the fields until the tide drops. Gulls also move in to mass on many fields at Foulness and for some miles inland.

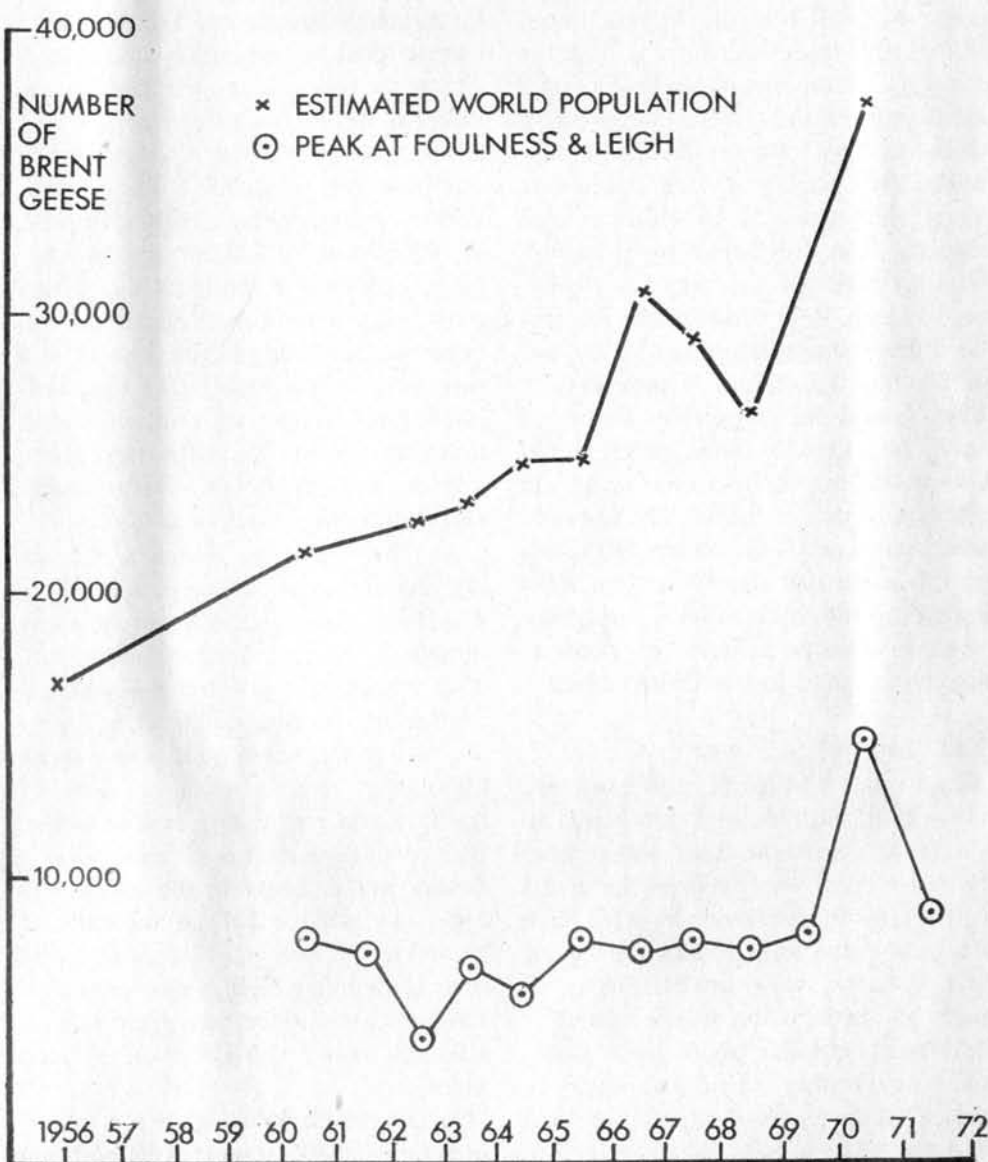
In the spring departing winter migrants and returning summer migrants overlap. Newly arrived willow warblers and chiffchaffs appear on the saltings,

in the small wood and patches of scrub. Wheatears are to be seen everywhere on the island for a time, but do not stay to nest. Among those which remain to breed are cuckoos, yellow wagtails, sedge warblers, whitethroats, swallows, housemartins, and, of course, the terns. The breeding population of little terns in Great Britain is now reduced to about 1,600 pairs, they suffer badly from human disturbance to their nesting colonies on beaches. At Foulness in the past they have nested mainly on the Outer Shellbank, where as many as 90 nests have been recorded, although the numbers fluctuate from year to year. Recently, possibly because of increased use of this bank by fishermen, and disturbance by landings from boats, the little terns have favoured the smaller shellbanks now developing as already described, along the edges of the saltings. This year a total of only 36 nests were found. On the other hand, common terns which only nested in small numbers in the past, had 61 nests

this year, and sandwich terns which did not nest at all until a few years ago, had 26 nests. It seems tragic that not only must the brents lose their biggest winter feeding ground just as their numbers are reaching a reasonably safe level, but also these three species of tern must lose an important and expanding nesting ground. Other suitable areas for these birds are also threatened by development, not only on the coasts of this country, but of the continent as well.

### Planting *Zostera*

In the case of the brents, their other smaller feeding grounds are already used to capacity. At the Stage II hearing of the Roskill Commission, Professor Matthews was asked if *Zostera* could be grown artificially in refuges set aside for this purpose. He replied that many attempts had been made, but none had been successful. When the Government rejected the







Roskill findings and chose Foulness for the site of the TLA, much was said about the possibility of providing "alternative sites" for the displaced birds. The fact is that there are no alternative sites; Foulness and the Maplin Sands are unique and irreplaceable. In February of this year, the Nature Conservancy carried out an experimental transplanting of *Zostera*, 20 clumps I believe. Laudable as this may be, the success or failure of such experiments cannot be proved in the short time before work on reclaiming the Maplins would have to begin for the TLA to be in operation in 1980 as planned. In any case, how does one set about replacing a bed of *Zostera* eight miles long and 400 yards wide, bearing in mind that it will grow only where conditions are just right? Meanwhile, what happens to thousands of brents deprived of their main food supply in the middle of winter? The disaster of the 1930's demonstrated what happens when they have to turn to alternative foods. In that case they were saved by the recovery of the *Zostera* on some of its former grounds. This time there can be no recovery.

Oystercatchers and ringed plover nest on the Shellbanks and elsewhere on the island, black-headed gulls on the lastings, lapwings, skylarks, red-shanks, pheasants, common and red-legged partridges on the fields. Herons have begun to nest in the last few years, with two pairs successful this year. Short-eared owls breed, one of the only two known places in Essex. Barn owls also nest, with five successful pairs this year and eggs in a sixth nest at present, presumably a second brood. Shelduck, mallard, shoveler and teal nest, and this year gadwall and pochard are reported to have bred successfully.

Not the least fascinating of Foulness is the chance of seeing "distinguished visitors", perhaps a water rail or kingfisher, rough-legged buzzard or a har-

rier, black-tailed godwit, ruff (a pair recently stayed well into the spring, raising false hopes of a first breeding record). Wood sandpipers, great grey shrikes, whooper swans, shorelarks and lapland buntings all turn up at times.

### Mammals threatened

The island is not without its mammals to interest the naturalist, although sadly it is some years since any signs of otters were seen there. Stoats and weasels, field and water voles are present, also common, water, and pygmy shrews, hares and rabbit, foxes, even badgers. All these animals would of course also be in the path of so-called progress in the form of new airport cities, and vast new motorways and rail links between Foulness, London, and the Midlands. The plight of the badgers would become desperate indeed. This part of Essex is rich in setts, many already under increasing pressure from encroaching development. Road casualties are disturbingly frequent. With development planned on such a gigantic scale, what hope of escape is there for the mammals, and if some succeed in escaping, what hope have they of acceptance by the occupants of other already reduced territories?

Much could be written about the effects on humans of the destruction of this wonderful area, and its replacement with a four runway airport, huge dock complex and oil terminal, but two points must be made. One is the hazard to aircraft posed by an airport in such a place, a hazard so great that ornithologists who know the area say that they would never risk flying out of it. I have written of the continual movement of birds there, much of this would continue in spite of an airport. Some might even increase, as in the case of gulls. Increased human population would mean more gulls attracted to scavenge on it. Unless every inch of

mudflats were reclaimed for many miles beyond the actual boundaries of the airport, waders would still mass on what was left. Both gulls and small waders are known to be attracted to the roosts provided by the open spaces of runways. This attraction has already resulted in accidents and near-disasters at other coastal airports.

The second point is that the chance would be lost for ever to create a wildlife refuge with viewing facilities comparable with the best in the country. The seawalls already provide good observation points and could be improved with well placed hides. A road already exists behind much of the seawall. With properly controlled access and good wardening, many people could have the pleasure of studying wildlife without disturbing it, the Foulness islanders would not have to leave their homes, farming could continue, and Essex would not be torn to pieces. Sooner or later some Government will have to face the fact that we dare not destroy any more of our coast and countryside. Why not now, before we reach the point of no return, not only for brent geese, but for ourselves?

### Proportion of young birds in wintering flocks of dark-bellied brent geese.

1954-1971

Winter	% young	Winter	% young
1954-55	40	1962-62	1
1955-56	26	1963-64	35
1956-57	7	1964-65	7
1957-58	53	1965-66	35
1958-59	1	1966-67	40
1959-60	23	1967-68	6
1960-61	45	1968-69	1
1961-62	3	1969-70	45
		1970-71	40

Ogilvie M.A. and Matthews G.V.T.  
*Wildfowl* 20, 21, 22.  
 (The Wildfowl Trust)

# GALAPAGOS:

## Islands in the balance

by Soames Summerhays

The ecology of the Galapagos Islands is unique and because of their associations with Charles Darwin, the islands occupy a special place in the history of the development of scientific thought. For this reason alone they merit special consideration. Yet today they are subject to threats similar to those that affect wild areas everywhere. If they are to retain their value to science the pressure from tourists must be controlled, populations of feral animals reduced and, at the same time, the economy of the human inhabitants of the islands protected. This article outlines the need, and the cost.

The Galapagos are a group of volcanic islands situated on the equator some 600 miles west of Ecuador the nearest mainland and their seat of government since 1832.

Oceanic volcanic island ecosystems are far less complex than mainland ones. As vulcanism ends erosion begins. The diversity of life depends initially upon the transport systems available to move species from the mainland and the degree of topographical, geological, and climatological variety that provide established species with the conditions necessary for adaptive radiation.

The availability of transport determines from where the colonists are likely to originate, and the physical isolation of the islands will favour particular groups in a sieving and selection process before they arrive.

The transport of animals and plants from the Western Pacific to this part of the Eastern Pacific is rare and could be feasible only for fish or marine in-

vertebrate larvae. The main oceanic currents originate either from the Gulf of Panama or from the Antarctic region, the latter passing northward near the coast of South America and then westward towards the Galapagos. These two currents are responsible for the main water flow around the islands and travelling at a speed of up to two knots, thus place them within a three week journey of the continent.

Large South American rivers, like the Guayas, provide "vegetation mats" for the rafting of land species and it is highly probable that this form of transport was one of the most important in the colonisation of these islands. By "free floating", rafting, or aerial transport, the islands gradually gained a flora and fauna. With the low survival rates of these transoceanic journeys, it is not surprising that the terrestrial vertebrates of the Galapagos consist mainly of birds and reptiles which are better adapted to be surviving such rigours than mammals and amphibians.

The mixing of oceanic currents, somewhat to the east of the archipelago results in very high primary productivity and the high concentrations of plankton and fish provide excellent feeding grounds for sea birds, whales, and sea lions. Due to the considerable food supply, spectacular nesting sites of sea birds have been established on some of the outlying islands. Isla Genovesa is said to have approximately 140,000 pairs of red footed boobies, as well as large colonies of frigate birds and storm petrels.

The presence of both warm and cold currents around the islands has caused anomalies of animal distribution. Fish found normally only in cold water and the fur seal and penguin from the antarctic are found north of the equator alongside tropical or subtropical species like the American flamingo.

Thus, initially, the islands supported a small number of species of widely ranging origins, but a large number of

ecological niches were left vacant. The common ancestor of the finches has evolved into 13 different species on these islands; their ecological equivalents on the mainland consisting of six families of song birds, the wood warblers, tanagers, grosbeaks, titmice, blackbirds, and parrotbills. Competition for food appears to have been one of the more important factors for divergence which has resulted in morphological changes in the beak, skeleton, jaw musculature, heart size and alimentary canal, enabling the birds to make more efficient use of an increasingly specialised diet.

### The tortoises

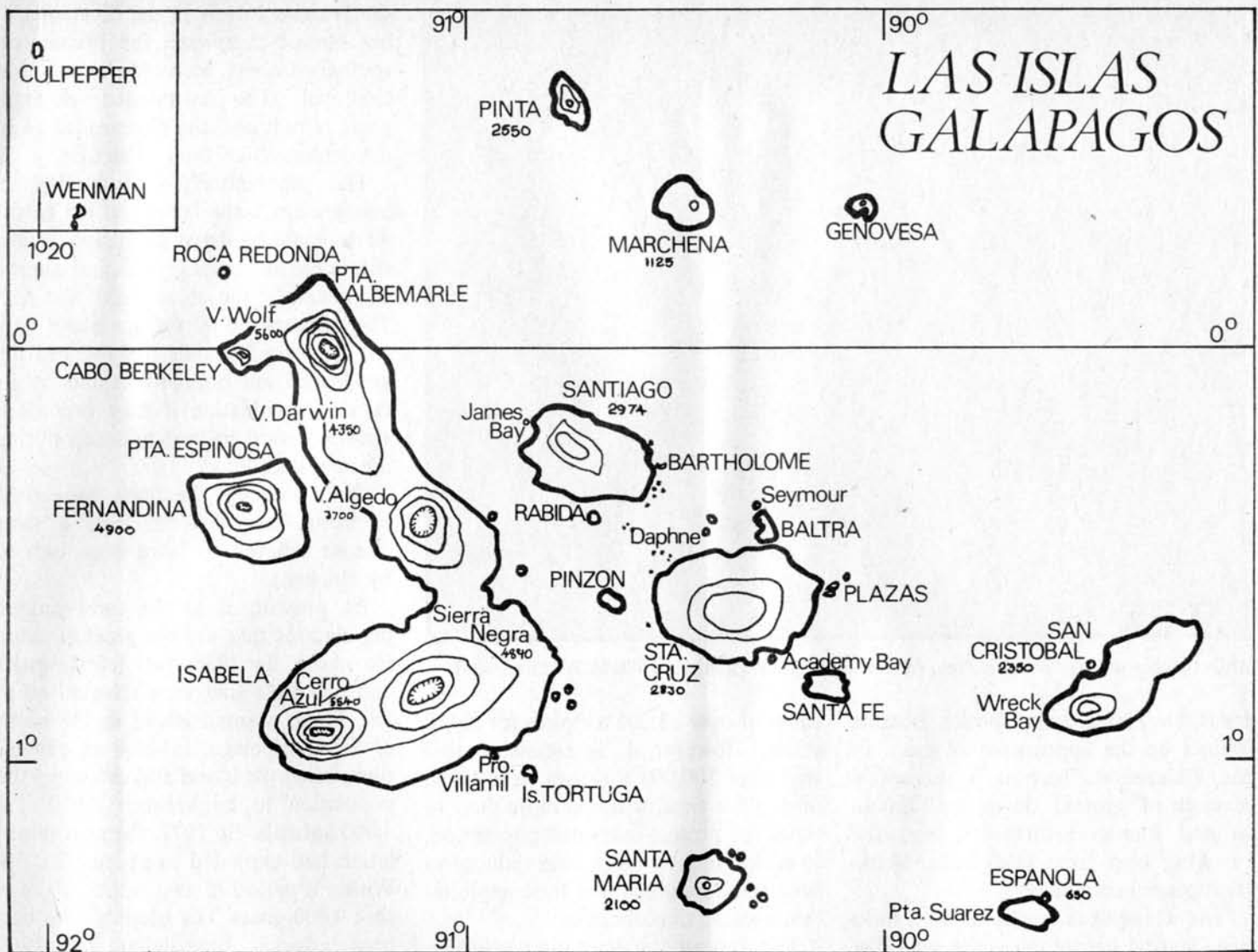
The tortoises, of which there were fifteen different subspecies a few hundred years ago, isolated topographically or geographically, have adapted to their particular environment, and have remained as individual populations. For example, on the largest island, Isabela, there are five different subspecies each inhabiting a different volcano.

Isolation of different populations and consequent genetic drift may have resulted in different forms of the same species, which should possibly account for the seven subspecies of lava lizard and five species of the indigenous rat.

This unrivalled opportunity for divergence has resulted in a large number of unique species and adaptations. The marine iguana is a case in point, being the only lizard to have turned to the sea for food. Of the 700 species of vascular plants, 40 per cent are endemic. Similarly, 80 per cent of the reptiles, 75 per cent of the birds and all of the mammals are unique to the islands.

Partly as a result of competition for food, many Galapagos animals are extremely adaptable and flexible in their behaviour. One species of mocking bird which lives on the low, dry island of Española, experiences intervals of food scarcity. It has an ex-





treribly broad feeding niche, probably greater than any mainland form in its genus. It has been observed to take the young of boobies and doves, and will also eat the doves' eggs, quite apart from its normal diet of seeds and insects, and it will test almost any article for its edibility.

### Adapting to survive

Adaptability of behaviour seems to be essential for the survival of many birds on these islands. The sanguiferous or sharp-billed finch from Isla Wolf drinks the blood of boobies to supplement its diet.

The mangrove and woodpecker finches use twigs or cactus spines to extract insect grubs from dead branches. Yet another finch occurring on the Islands of Española and Genovesa has developed a method of turning over comparatively large stones, called "bill-bracing", to find seeds beneath them.

Life on the Galapagos has consequently been diversifying rapidly for

the last five to 10 million years since its first colonisation, as is the tendency in ecological succession. The greater the complexity of the biota, generally the more stable is the ecosystem.

As always, colonisation by European and American man initiated a trend towards simplification and uniformity. Introduced forms seriously reduce or displace the native animals and plants. On islands such as these, although wildlife is well adapted to prevailing conditions, in some cases it is highly specialised, suffers from small populations and therefore has little genetic variability. Over-specialisation can render species very vulnerable when exposed to unspecialised forms such as goats. Furthermore, they may be weakened by exposure to the parasites and diseases of mainland forms.

Oceanic island animals develop in the presence of a few well recognised predators, so frequently they are unable to recognise the danger of unfamiliar predatory mammals (dogs, cats, rats, pigs and man). Only by the slow

process of selection will they learn of their danger.

### Conflict with man

The activities of man are in direct conflict with the requirements of wilderness areas. Some oceanic islands groups have already lost their ecosystems and some are in the process of dismemberment; 90 per cent of the extinct birds listed in 1967 were island forms. Flightless birds, which are most likely to evolve on islands, feature high on the list of extinct species. The Galapagos flightless cormorant may be an exception, being a sea bird; it appears to be maintaining a population of around 3,000. The penguins also appear to have a stable population of between 4,500 and 6,000 birds. Fortunately, they both occur in the more inhospitable regions of the archipelago, but remembering the fate of the great auk, the flightless owl of Cuba and the rail of Hawaii, there is reason for some concern.

Of the twenty-five species of song



Male Galapagos Giant Tortoise, Pinta (photo: Sally Anne Thompson, World Wildlife Fund)

birds on Hawaii, six species became extinct on the appearance of man. In the Galapagos, there is a noticeable absence of ground doves and hawks around human settlements, and the mocking bird from Isla Santa Maria disappeared completely.

The Galapagos invasion may have been started before the white man discovered the islands in 1535, although little trace of human influence was left, and probably very little damage was done to the environment. Spaniards visited the islands in the sixteenth century but did not exploit them as they found the coastal areas too arid. In 1684, the pirate ship *Bachelors Delight* entered the Pacific, and with another vessel the *Nicolas* captured three Spanish merchantmen near the Lobos Islands, and then sailed for the Galapagos. From then on, these islands were used as a base by British buccaneers. One of their first actions was to release goats on to Isla Santiago in order to supplement their main food supply of tortoises.

### Tortoises for whalers

In 1793, Captain James Colnett of the Royal Navy was sent out to survey the islands for possible anchorages for the British whaling fleet. The heyday for the Galapagos whaling grounds was between 1830 and 1860. During the period 1831-1868, 79 whaling vessels made 189 visits to the islands and during this time recorded a combined

catch of over 13,000 tortoises for ships' stores. However, it is estimated that well over 100,000 tortoises were taken during this time, which is more than 10 times the present estimated population. In addition, the whales were reduced to such small numbers that their exploitation became uneconomical.

The repeated colonisation attempts on Islas Santa Maria, Isabela, San Cristobal, and Santa Cruz imposed an even greater strain on the tortoise populations. They provided the main source of livelihood; they were traded with ships, and the oil extracted from them yielded additional income. Aboard ship, the tortoises acted as excellent food supplies, surviving without food or water for periods of up to 14 months.

By this time, exploitation of the fur seals was under way, and they were slaughtered in their thousands for their valuable pelts. Eventually they were almost exterminated and were thought to be extinct. Fortunately their population is now recovering.

### Exotic intruders

Many species have been introduced by man. This is rarely beneficial if ever. Once established, exotics may overwhelm the indigenous species. For example, the native guayava plant is in perfect balance with the environment. The continental guayava on the other hand, which has been introduced to many islands, is rapidly eradicating

the *Scalesia* forests in the highlands. It has almost completed the process on southern Isabela, Santa Maria, and San Cristobal. The introduced elephant grass is reducing the pampas zones in the highlands of Santa Cruz.

The unintentional introduction of animals has a similar effect. An earthworm, said to have been introduced within the last twenty years, has altered detrimentally the structure of the soil. The appearance of the mainland fire ant on several islands has reduced the indigenous ant populations and by its rapid dissemination it may become a serious hazard to bird nestlings during the next decade.

Quite recently, the finch population of Santa Cruz suffered from a virus disease believed to have been carried by chickens.

At present, it is the feral animal populations that are the greatest cause for alarm. In 1958, two female goats and one male goat were released on to Isla Pinta, a small island in the north of the archipelago. In 1968 an expedition visited the island and estimated the population to be between 3,000 and 4,000 animals. By 1972, the goat population had exploded to at least 20,000. Within a period of two weeks, 10 men shot 9,000 goats. The island's flora had been affected drastically. The 1968 expedition took five hours to penetrate the thick vegetation to the summit. In 1972, using the same route, the journey took only one and a half hours. The undergrowth that had always been dense was sparse; the cactus zone had been demolished, and by 1968 eight species of plants had vanished.

Tortoises are affected more seriously than other animal species. Goats and to a lesser degree, wild cattle, donkeys, and horses compete with them directly for food. Pigs attack their nests and dogs and cats eat the young.

The whole environment is being changed by the introduced animals. On Isla Santiago the goat population is estimated at over 60,000, and feral pigs at more than 10,000. Their combined effect is to alter the vegetation completely, and quite extensive erosion has already started in the highlands. We know that over-grazing in the Middle and the Mediterranean has resulted in desert or scrub-land. Could we be seeing the beginning of the same process in the Galapagos?

Finally, by his day to day actions man has altered many aspects of the



‘And when both Seas and Lands  
have compast been Ther’s  
some thing still unfound,  
some things unseen’

The Galapagos—perhaps  
the last enchanted islands

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islands' ecology. Over-fishing has seriously reduced the number of crayfish, tuna, and grouper.

Something like 120,000 pounds of crayfish used to be exported annually, but these fish are now becoming increasingly scarce.

Raising crops on virgin volcanic soil produced prodigious initial yields followed by a series of crop failures as the soil fertility was reduced. Now there is an increasing use of crop sprays which inevitably damage the environment further.

### Tourist pressure

Tourism has increased markedly since 1968. The trend has been towards larger vessels carrying greater numbers of naturalists and tourists. Many parts of the islands are barren or inaccessible, so most vessels have to utilise a limited number of landing places. Certain areas are visited more frequently than others, needless to say those that have the more flourishing wildlife. To date, the strain on these areas has not been too disastrous but if the pressure is increased, as it appears it will be, animals may move away from the accessible areas, ultimately reducing tourism, and thereby adversely affecting the country's economy.

The present maximum legal limit of eighty tourists on one vessel is soon to be reached by the arrival in the islands of a ship of that capacity, but there is no legal limit to the frequency with which any one area is visited. One of the most frequented islands is South Plaza, which is only some 700 yards long and 150 yards wide.

If tourism were restricted the only economic alternative left for the people of the Galapagos would be greater exploitation of agriculture, but farming is limited by terrain, climate and the availability of suitable soil. One of the larger islands, Santa Cruz, has a maximum of 20,000 acres of potential farm land. It might be better to use it for farming than to preserve it as it is.

The Ecuadorian government has been far-sighted in its legislation to date. In 1934, a law came into force protecting most of the indigenous species. In 1959 the non-inhabited areas were designated as a National Park, the most recent boundaries of which were drawn in 1968.

Tourism is essential to the continued existence of the National Park, but



*Damage by feral goats, Pinta 1970*

uncontrolled pressure from visitors could lead to its ecological collapse.

The following measures might reconcile the two.

1. The maximum number of tourists ashore at one time and in one place should be reduced considerably.
2. There should be an upper limit on the frequency with which each area can be visited in the course of a week.
3. Some areas should not be visited during the breeding seasons.
4. Visiting yachtsmen should receive permits for visits to each island.
5. The legislation should be enforced by National Park Officials.

### The Charles Darwin Station

In 1959, after an investigation by two UNESCO experts, on their recommendations and in conjunction with the Ecuadorian government, the Charles Darwin Station was founded and based in Academy Bay, Santa Cruz. It was at this time that the National Park boundaries were first created. Unfortunately, the law was not enforced and its boundaries receded under the encroachment of settlers. This continued until 1968, when new boundaries were drawn encompassing a smaller area, and enforced by the Ecuadorian Land Commission.

Four years ago, the Galapagos National Park Service was instituted under the existing Ecuadorian Forestry

Service. One superintendent and two National Park officials control the administration and, at present, ten wardens.

The Darwin Station serves several functions. As a scientific institution it provides all the facilities for visiting scientists. At the same time it concerns itself with the education of the islanders on matters of conservation. Without their co-operation and assistance, any conservation effort would be much less effective.

On matters of conservation, the National Park Service works hand in glove with the Darwin Station. The funds for conservation projects are raised by the latter, and with their technical help and facilities the National Park Service executes the plans.

At present, the main conservation effort is being directed into two channels. Since the tortoise populations on many islands are on the verge of extinction, an intensive breeding programme has been going on since 1964. Three of the 11 surviving subspecies are in serious danger and are being reared at the Darwin Station. The eggs are taken for hatching and rearing from some islands like Pinzon, where rats are the predators. On others, virtually all the adults of the subspecies are breeding in captivity. For example, 12 out of possibly 15 surviving adult Española tortoises are at the Station. From Isla Pinta, there is one adult, a male, in captivity, and the survival of the subspecies depends on another animal, known to be still on the island, being a female.





Beagle III: research vessel used by scientists from the Charles Darwin Station (photo: Sally Anne Thompson, World Wildlife Fund)

### The cost of feral control

At present the greatest threat to the islands' native species comes from feral animals. In conjunction with the Darwin Station, the National Park Service has concentrated most of its energies on reducing feral animal populations.

The Darwin Station receives some \$20,000 annually through Research Tables, which partially covers the cost of running the Station. In addition, the maintenance of a research and transport vessel costs around \$30,000. To operate efficiently and to continue with the programme of feral animal reduction costs at least \$100,000 each year.

To eliminate the goat population on the island of Santa Fe would cost a total of \$4,000. To extirpate the feral animals on all islands would probably be impossible, and in any case by the Darwin Station's standards, very expensive. To reduce radically the feral animal populations on the larger islands would cost in the region of \$30,000 for each project. On small islands like Pinta, the cost might be halved. If the money were available, within two years the feral animals would be down to a fraction of their present numbers and one or two wardens would have to be stationed on each island to maintain control of populations.

The ecology of the Galapagos is unique and occupies a special place in the history of the development of scientific thought. The islands have a legitimate claim to special consideration. Already the diversity of the communities they support is being reduced and there is a very real danger that they will not be able to withstand the pressure from tourists and feral animals. If they are to survive, the programme to control feral populations must be expanded at an initial cost of \$150,000 and maintained at an annual cost of \$14,000 over and above the Darwin Station's present budget.

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# Towards a unified science

## Causality in a unified science

If the notion of causality is to be retained in a unified science it needs to be seriously re-examined. A complete "causal" explanation of any event, such as John Smith's falling down the stairs and breaking his leg, would involve among other things taking into account all antecedent events since the world began. Thus John Smith would probably not have fallen down the stairs if he had not gone to bed so late the previous night, nor if he had not drunk so much, nor if his wife had not put so much polish on the stairs, nor if his shoes had not been recently re-soled. Nor would this accident have occurred if he had not accepted a new job which made him get up so early, nor if he had been less preoccupied by what he was going to say at his board meeting. It is also true, however, that he would not have fallen down the stairs if he had not bought a house with such a slippery staircase, nor if his parents had not moved to London from the country where they had previously lived in a bungalow which had no staircase; nor for that matter if he had never been born, nor if his parents had never met, and similarly with their parents. If we assume our hero's pure English pedigree, and if we go back far enough in this way, say 33 generations (1,000 years), we get a contemporaneous set of John Smith's ancestors that so far exceeded what must have been the population of England at that time that each of its members must figure several hundred thousand times in John Smith's genealogical tree. It would follow that the slightest modification in the marital history of any of the inhabitants of Anglo-Saxon England just before the Conquest would have averted the accident in question.

But John Smith's fall can also be regarded as a complicated physical process, involving the interplay of an immensely elaborate nervous system with an equally complex organisation of limbs, muscles, organs, tissues, etc. Such an organisation has taken countless millions of years to evolve. Atoms had to associate with other atoms to become molecules. The biosphere had to undergo a series of modifications to

render possible the development of the chemicals of life: carbon, oxygen, nitrogen, phosphorous. These had to be combined in a particular way for those macromolecules like proteins and nucleic acids to emerge, which are the basis of living matter.

Cells had to appear, and they had to learn to combine to form multi-cellular organisms. About three billion years of evolution were then necessary before, out of the innumerable forms of life that had been tried and abandoned, one emerged that could conceivably be classified as man, and another million or two before there emerged another that could be classified as our John Smith.

Every little bit of this elaborate history has left its marks on our hero, and it is reasonable to suppose that had there, at any stage, been but the slightest deviation from it, he would have been spared the sad incident we are recounting.

Indeed, it must be clear that any one of the factors involved in this colossal process could be singled out as a "cause of the accident".

Since the world is a four dimensional open system, whose spatial and temporal boundaries one cannot delineate, the process appears infinite in extent, and hence the possible causes appear infinite in number. In addition, it will be possible to divide the process and its constituent events indefinitely into as many sub-processes and sub-sub-processes as we wish.

If one regards this in a somewhat different light, one can consider John Smith as but a differentiated sub-process of a vast four-dimensional phylogenetic system, and think of our incident in terms of the behaviour of the latter instead of one of its more insignificant sub-processes. It thus becomes clear that in fact there are not an infinite number of causes of our incident, but only one cause, and this is the infinite four-dimensional systemic process involving the inter-action of all John Smith's ancestors with their respective environments since the world began.

Certain sub-processes or events can be singled out and regarded as causes merely because, in a given context,

they have the highest information value, i.e. are most relevant to explaining it. They are causes only for the purposes of this context. To regard these events as causes is also valid if a reasonably low degree of precision is required, i.e. for everyday purposes. For scientific purposes, it is evident that the whole process must be taken as the cause. The reader by now will realise that for the word "cause" can be substituted the word "model", and that for the "total cause" can be substituted "general behavioural model". Empiricists, when they talk about one event being the "cause" of another, are in fact building a model to explain a given situation. In accordance with the law of economy, they are merely selecting, out of an infinity of possible factors to be taken into account in their model, that which has the highest information value in the given context.

## "Causes" as "explanation" or "model"

Thus if the term "cause" is to have any useful meaning, it must be taken to mean "explanation" or "model". Unfortunately, the term tends to be used in such a way that it only applies to that part of a model that represents past events; thus, in explaining the cause of John Smith's fall, we have exclusively referred to those events that preceded it. We must not forget that a model is four-dimensional. If it is to serve any behavioural function, it must permit the prediction of future events, as it is in this way that the model built up by a system can contribute to its increased stability. Indeed, the explanation of past events is only of use insofar as it leads to improvements of the model permitting ever more precise predictions.

The model of behaviour whose outline emerges from this series of articles is based on a number of generalities such as the concept of order, the principle of economy, the notion of the interaction between a system and its environment, and the accumulation, particularisation, and sequential principles. These can be differentiated and organised to constitute a model on the basis of which we can predict their future responses just as easily as to explain those that have already occurred. In both cases, the explanation that will be postulated will be that which fits in best with the model of which the



generalities are provided by these same general principles.

A given process can therefore be explained in the light of any of the principles that make up our general model, each explanation corresponding to what could be regarded as the establishment of yet another cause. Let us illustrate this with reference to the life-cycle of the sitaris beetle.

Its life-cycle is described thus by Bierens de Haan: "Its larvae pass their development in the cells of the solitary bee anthophora. To this end the sitaris mother lays her eggs at the entrance of the nest of this bee. The young larvae hibernate in these galleries till, in spring, when the larvae are already seven months old, the young bees leave their nest. At that moment the sitaris larvae attach themselves to the hairy bodies of the bees. Now, these young bees are mostly males, as the males come out earlier than the females, and it is therefore necessary for the larvae to go over on to the females which can only take place at the moment of copulation. If this succeeds, the larvae attach themselves to the thorax of the female bee and try to pass over to an egg or anthophora at the moment this is laid. If this also succeeds, the larva can feed herself first on the eggs and then on the contents of the cell of the anthophora."<sup>1</sup>

In the light of a general behavioural model, we can provide the following "causal" explanation for the laying of the egg by the sitaris beetle in front of the nest of the anthophora:

1. We know that a response only occurs when there is an environmental demand for it. The situation that triggers off the requisite response is referred to as a stimulus. Thus the sight of the nest acts as a stimulus releasing the egg-laying response. This is what is normally referred to as a "cause" by the empiricists.

2. If a system is capable of any response, it is because it possesses the corresponding instructions, in this case, the egg-laying instructions, that have been built up phylogenetically, ontogenetically and by what is normally called "learning" (neurogenetically).

3. Neither the presence of the environmental stimulus nor the possession of the correct instructions is sufficient to explain a response. Behaviour, as we know, must be explained in terms of the larger system, i.e. the interrelation between the two. Thus the

cause can be regarded as the sight of the nest, and the possession of the egg-laying instructions.

4. We know that a response must be regarded as but a step in a vast accumulative process. Thus we can regard the cause as all previous steps in the long-term and short-term behavioural processes, leading to this particular one.

5. We also know that processes forming part of the more general one must occur in the correct sequence. This must hold for the differentiated parts of the sitaris beetle's phylogenetic process. The necessary stimulus releasing the clinging response in the sitaris beetle is the sight of the male anthophora emerging from the nest. For this stimulus to be available, the female sitaris beetle must lay its egg in front of the anthophora's nest. This action can be taken as occurring in order to permit the appearance of the stimulus that will trigger off the subsequent response.

6. By the same token, we can say that it will occur to permit the subsequent response.

7. We know that no system can survive unless the behaviour of its constituent parts is subordinated to it. This must be true of the behavioural unit or system which is the sitaris beetle's unit of phylogeny, i.e. its species. Thus one can say that the response will occur so as to favour the survival of the species.

Unfortunately, arguing *a posteriori* in this manner is not regarded as legitimate by empiricist philosophers and those scientists that remain influenced by them since there is no empirical reason for postulating a goal, and to do so is to commit the "teleological heresy". It is interesting to note, however, that the method is nevertheless in current use among good scientists.

A typical example of this is Lissmann's explanation of the peculiar way in which the *gymnarcus niloticus* swims, with its "spine rigid as it moves". He argues that:-

"It would be rash to suppose that such a deviation from the fish plan could be attributed to an accident of nature. In biology, it always seems safer to assume that any redesign has arisen for some reason, even if the reason obstinately eludes the investigator. Since few fishes swim in this way, or have electric organs, and since the fishes that combine these features

are not related, a mere coincidence would appear most unlikely."

The model that he proposes to explain this phenomenon is as follows:

"The *gymnarcus* emits its own electric field, and its electrodes must always be kept in constant alignment. This condition would not be maintained if it constantly swished its tail like other fish. A mode of swimming that keeps the electric field symmetrical with respect to the body most of the time would therefore offer obvious advantages. It seems logical to assume that *gymnarcus*, or its ancestors, acquired the rigid mode of swimming along with the electric sensory apparatus and subsequently lost the broad oarlike tail fin."<sup>2</sup>

Lissmann is in fact invoking a "wider teleonomic cause" in terms of the *gymnarcus*'s most general goal: survival, or increase stability.

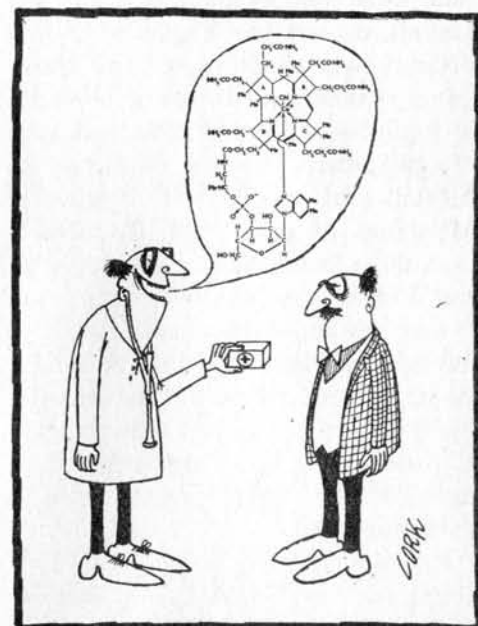
To establish the "cause" of a behavioural response is to provide an explanation for it. An explanation is a hypothesis based on a model of behaviour. This must take into account all the factors that can exert some influence on the responses—not just certain specific factors such as environmental ones—to the exclusion of other factors such as inherited instructions and goals.

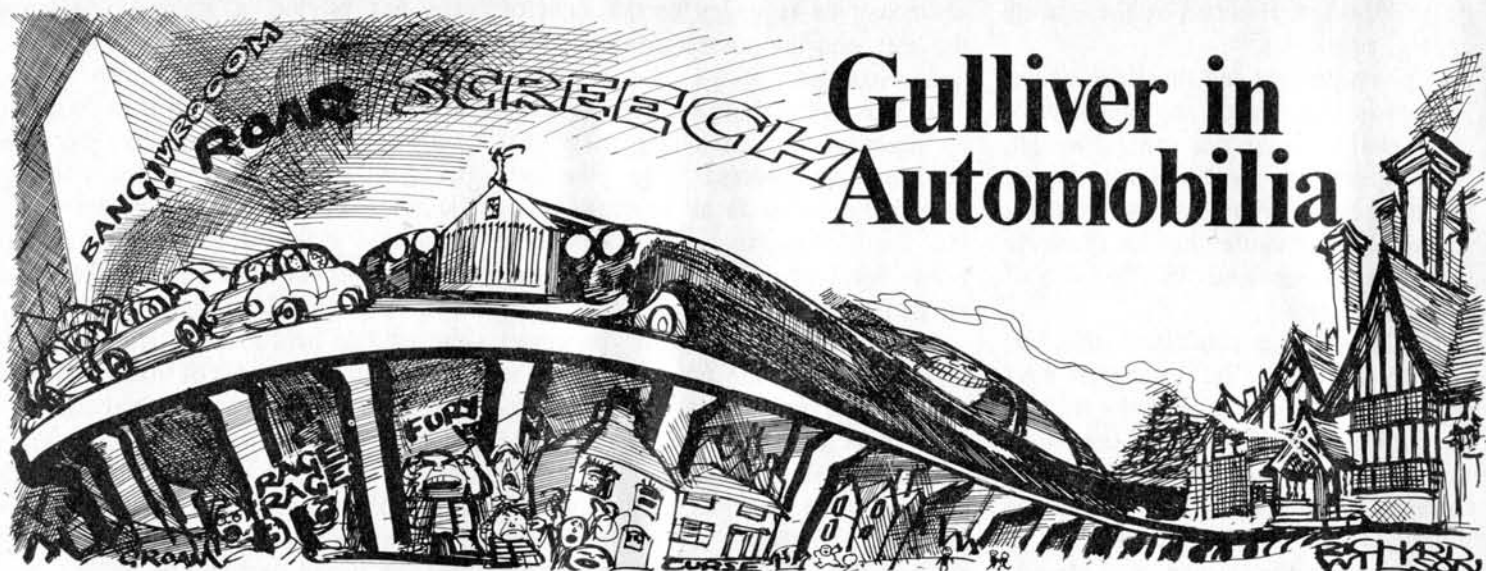
Many such relationships can be established, each one of which will be based on our general model of behaviour. A complete "causal" explanation of the action in question will take all of them into account.

Edward Goldsmith

<sup>1</sup> Bierens de Haan, J. A. *Animal Psychology* (Hutchinson's University Library, London), 1946.

<sup>2</sup> Lissmann, H. W. "Electric Location by Fishes" in *Scientific American*, March 1963.





## The author discovers the disadvantages attendant upon uncheck'd fecundity

The first Commandment, it is written, wherewith Adam was bound at his creation was this, that he should be fruitful, and multiply: an Injunction which his Posterity have ever striven to obey to the Utmost of their Power, however much they might contravene the Divine Will in other Particulars. But this natural Prolificity hath been at all Times subject to limitations no less natural, and so the Earth hath not been replenish'd beyond her Capacity to sustain. Of these Limitations, the grosser and more horrid Sort, as War, Famine, and Pestilence, are of late Years much abated, as far as England at least is concerned: no War of Consequence having troubled this Realm since the Great Rebellion, no Famine of more than local Note in the Memory of our Grandsires, nor any Plague since that of Sixty-five, when I myself had scarce left my Cradle. Our Population remains in Equilibrium by the mild influence of two main causes, namely the Mortality of Infants and the delay'd Marryings of poor Folk. To abolish even these lesser Misfortunes would be the Wish of any humane Person: and it must be accounted to the Credit of the Automobilians that in their Realm young Sweethearts are not debarred by Poverty from the early Consummation of their Union, nor Parents forced to see half their progeny precede them to the Churchyard.

But this Blessing brings with it a Curse, as every Light cast a Shadow. Throughout Automobilia the Numbers

of Humankind are rising as steadily as Floods in February, and threaten indeed to prove a universal Deluge at the last. In my Account of this Land I have discovered to the Reader already many Crimes and Follies: not one of which, I dare say, but is aggravated and exacerbated by the continual Increase of Population. I have spoken of the Automobilians' Greed; of their Tyranny over the Earth and her Creatures; of the destructive Fury of their incessant Journeyings; of their Waste of good Things and their Fabrication of countless bad ones. Were these but the wanton Aberrations of an insane Monarch and his deprav'd Courtiers, the World might take very Little Heed of them; were they the casual Barbarities of remote Colonists in a desert Land, they might be lost unnoticed in the circumambient Desolation: but what are but harmless Pranks when practis'd by a few, become when multiply'd a millionfold the Suicide of a Nation.

Not all the Automobilians are unaware what a Bane their Multiplication is prov'd to be: and indeed their Ingenuity hath long since perfected many curious Devices whereby Man and Woman may enjoy their amorous Sport without Fear of Progeny. This being so, I was long perplexed to know why their Numbers yet grew: and found that the Prevention of Conception is oppos'd by many Persons and for divers Reasons. Some hold that the Fear of Issue is a great Deterrent against Fornication, or again that Pregnancy is the proper Punishment for the Sin of illicit Copulation: both which Beliefs, I fear, are conducive to nothing but the Production of a Legion of un-

wanted Bastards. Others argue that it is the Duty of every Wife to bear as many Children as Nature permits (the Leaders of this Party, I was surprised to learn, are themselves without Exception Bachelors). But the commonest View is that Men and Women have the sacred and inalienable Right to bring to Birth however many Offspring they chuse, without Interference from the civil Authority. (This is oddly at Variance with their Custom in all other Matters, where they accept from every Jack-in-Office Interferences such as no free Man would Stomach.)

The Blindness of the Automobilians is perhaps explain'd by this, that they have so far suffered but the Fore-runners and Skirmishers of Catastrophe: the main Assault, by Starvation, is yet to come within their Frontiers. For they have so contrived it, that the Superfluity of their Manufactures doth purchase them the Food of foreign Lands, and thus they wax fat upon the Sweat of starving Serfs whom they never see. They are indeed wonderfully ignorant of the Means by which Food must be obtain'd; they drink Milk but never look upon a Cow, and are summoned from their Beds not by a Cock but by a clock, to break their Fast upon an Egg laid Leagues away. They deny that their Land is over-full of Folk: yet were all Traffick in Goods to cease, they would speedily learn their Error in a hard School, and by a Lesson few would survive. So was it in the Days of Noah, that "They were eating and drinking, marrying and giving in Marriage, and knew not until the Flood came, and took them all away."

Nicholas Gould





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# Down to earth

## False alarm for fungi

The Belgian "kwabbel" is called "knolvoet" in Holland. French gardeners know it as "gross pied", Germans say "Kopfkrankheit des Kohles", and Italians "mal de gosso dei cavoli". But to us it is clubroot—our commonest crop disease.

Its tiny spores, which have travelled the world, are too small to see except with an oil-immersion objective in a good microscope, but they swarm in sheltered broccoli fields, in hard driven small gardens, and in allotments where the cabbage tribe must grow too often.

Michael Stephanovitch Worodin of Russia discovered the clubroot fungus, *Plasmodiophora brassicae*, in 1878. He was the first to see exactly what happens when the root secretions of a member of the cabbage family (the order *Cruciferae*) such as a turnip or cauliflower, or the weeds charlock or shepherd's purse, reach clubroot spores which can sleep up to nine years in the soil.

They swell, bulge, split and tremble with increasing violence until suddenly there is a rapid movement of something tiny across the field of vision. The "zoospore" has escaped.

This is like an amoeba, a speck of jelly that flows along, rapidly expanding and contracting through the films of water round the soil grains, following the root secretions that stirred it into action for a maximum of five inches before its energy store is spent. At last it finds a feeding root hair of one of the *Cruciferae* and slides inside it. Now it becomes a "plasmodia", a slime fungus, primitively nearer a virus than a mildew or a mushroom, spreading through the sap channels of the unlucky cabbage, causing the "traffic jams" that make the distortions compared to human deformities in so many languages. The plant struggles on, robbed of food, but alive enough for the fungus to leave a mass of spores that can form 28 per cent of the tissue.

These must have a resting period before root secretions can stir them

into the tiny frenzy that begins their voyage. This explains how gardeners have planted new young cabbages in the holes where the old have died and grown a crop before the spores were armed for action.

Worodin's advice to Russian gardeners to *dig* rather than pull their cabbage stumps so the roots could be burned spores and all is still sound. The spores pass unchanged in manure if the cabbages are fed to stock, and no compost heap can hold 240°F for three hours to kill them. His suggestions of liming well (the zoospores dislike lime) and resting the soil from the cabbage tribe by rotation of crops so the spores die of old age, are still the only farm-scale controls.

Two favourite amateur counter-measures are dropping sections of rhubarb stem, or fragments of mothball down the dibber holes at planting time. The decaying rhubarb hides the root secretions with its oxalic acid and the mothballs with the fumes of paradichlorobenzene, but spore germination varies with soil warmth and moisture (60°–70°F is ideal for clubroot, which is worst in warm wet summers) and they appear to have early, late and maincrop varieties like the crops they attack.

Orthodox remedies mainly work by making the soil poisonous to the swimming zoospores and many are based on mercury, with calomel (mercurous chloride) the garden favourite, too expensive for farm use. These have the problem of mercury build-up. For just as water bacteria convert it to methyl mercury found in tuna and other fish, there is some evidence that soil bacteria include mercury converters. Research on old allotments could reveal increasing toxic metal danger.

None of the chemical controls, including the chlorinated nitro-benzenes which persist like the other organochlorine compounds, are 100 per cent effective, but all have one great advantage for the manufacturers. They leave the spores outside the five inch circles safely sleeping so a dose is needed for

every crop. So lime, rotations, and rhubarb are safer than anything that will add up in the soil through the years.

This year, the Henry Doubleday Research Association is beginning an experiment to conquer clubroot. It was established at Rothamstead many years ago that collecting the water draining from potatoes grown in large pots made a solution of root secretions that would wake up potato eelworm cysts. Unfortunately it proved too complex to synthesise. Now the HDRA will be growing clubroot-free cabbage seedlings in pots of sterilised soil and watering the collected secretions on beds of carrots sown on clubroot infested land, to wake up the spores all over it, not just in the radius round every *crucifer*, to starve under a crop they cannot attack.

Dozens of amateur gardeners will take part in the trial, to rule out failure from the many variables in spore germination, with the hope of finding if, and how, it is possible to permanently clear an allotment or garden of clubroot, except for reinfection in bought manure or soil from seed potato bags, the commonest causes. Though a collection of pot cabbages may be a garden answer, once we know how much we can dilute the secretions and the best timing for the operation, a farm-scale answer will involve skilled organic chemists in a search for a synthetic copy of the key secretion good enough to set the spores trembling and the zoospores racing for non-existent cabbage roots.

If we could conquer clubroot this would in effect add an island larger than New Zealand to the temperate world, merely by making more winter cropping possible. It would step up cattle production by making possible perhaps six times as many narrow-stem kale crops to balance with self-feed silage. It would open the way for plant breeders to develop kales and cabbages for the tropics where the 60°–70°F optimum soil temperature forbids them today.

Life support gardens in Wales and Scotland would gain more than better salads through the winter in terms of Vitamins A and C. Kale could well be the answer to the problem of a crop for stoking up the methane gas plant while the wind howls down the Glen.

Lawrence D. Hills



# Friends of the Earth

## North Sea oil

It might be apposite to begin with a quotation from the DTI's Report to Parliament on North Sea Oil and Gas, delivered to the nation's lawmakers in January of this year (Chapter 5).

*Precautions against Oil Pollution* (p. 11) has this to say: "The reputation of oil tankers as potential causes of pollution has tended in the public's mind to rub off on to offshore operations: after all, offshore wells and pipelines are located in stormy seas, and hence conceivably they could, in some unfortunate combination of circumstances, give rise to serious oil pollution. This association of ideas seems logical, but in fact the record of offshore exploration and development is very good. In the whole history of off shore well operations (and, in all, some 25,000 wells have been drilled), only one case of serious pollution has occurred—off Santa Barbara, California, early in 1969. And, in that case, the geological conditions were very unusual (the area had had a history of 'natural' seepage for years before the 1969 incident occurred), and were essentially different from those in the Continental Shelf (sic). The possibility of this type of spillage occurring in the North Sea is therefore remote and no pollution has in fact occurred there.

"A break in the pipeline connecting a well to the shore could conceivably occur, and oil would then escape into the sea. But, since operations are automatically controlled, the break would result in an immediate switch-off of pressure. The flow of oil would cease within minutes of switch-off.

"Ruling out the pipeline as a possible culprit leaves us with one other candidate—the well. Here the only source of serious pollution would be a 'blow-out'—an uncontrolled flow of oil into the sea from the formation being drilled or producing. Fortunately, blowouts are rare, but offshore operators regard the risk very seriously and take elaborate precautions to prevent them."

Does the above put your mind at rest? Do you recognize here your favourite oil companies? Friends of the Earth have been looking with a certain wariness at the goings-on off Britain's shore, and the above Report, while in

many ways a very useful document, seems to be much less bothered about technical and environmental problems than the situation warrants. Indeed even oilmen seem more concerned than does Tom Boardman, the Minister for Industry, whose Foreword introduces the Report to Parliament. One such oilman, an American visiting the Shell/Esso Auk field, was quoted by Tam Dalyell in *New Scientist* to the effect that "Off Louisiana we have the occasional hurricane, and know what to do. We thought there were no hurricanes in the North Sea, and things would be easier. You have a hurricane once a week, and call it a storm. The unpredictability of winds, and wave movement, create greater problems than in the Caribbean".

That may sound like one man's opinion, but it is shared by many others. Professor Norman Sanders of the University of California at Santa Barbara knows first-hand what can happen even in the placid waters off southern California. Professor Sanders, in a letter to *The Times* and a cover article in *New Scientist*, has pointed out that the depths and sea-conditions involved in North Sea fuel production are at the very limits of present offshore technology—and may, indeed, be beyond them. But the rush into the North Sea depths continues to accelerate, until it looks positively Gadarene. Whitehall is going for the ride; the speed of developments is too swift for any overall plan to maintain control and co-ordination.

That said, it would be presumptuous for the small band of Friends of the Earth, with their overextended resources, to leap in front of the North Sea juggernaut and cry "Halt!" Like our opposite numbers in Whitehall—and indeed in St. Andrews House—we don't know enough about it. But what we do know suggests that a slightly slower pace would be advisable. The surging onrush of the oil corporations seems likely to lead to a motley piecemeal industrialisation of the Scottish coast, which may bring economic advantage to Scotland—or may bring massive disruption, social and ecological. More than a few Scots fear

that the outcome may be the latter. They have begun to link up, in a loose coalition of concern, to question the premises, often thus far unstated, which underlie the "North Sea bonanza". For instance, one group of objectors is challenging plans by the American company Chicago Bridge to build drilling rigs, up to 600 ft high, on the shore of Dunnet Bay in Caithness. Another group is lined up to oppose the Norwegian company Christiaan Neilson, who propose to build 400 ft rigs, dry-dock facilities, and an oil platform on the Bay of Howton in the Orkneys, and quarry 200,000 tons of stone per year from a nearby hill.

As the realisation of the scope and impact of the coming onslaught gradually dawns, more and more groups are coming together, in the hope of assuring that what happens does so for the long-term benefit of local communities, for Scotland and for Britain as a whole. At the moment it looks too much as though the aim is for short-term gains, bringing doubtful returns to those who are also, willy-nilly, exposed to the greatest long-term risks. It's not good enough; and Friends of the Earth, in the face of bland assurances like that Report to Parliament, are lined up with the doubters. If you, too, find it hard to believe that "the record of offshore exploration and development is very good", in the context of a North Sea capable of 100 mph winds and 100 ft waves, let us know. Somebody has to watch what they're up to out there.

Walter Patterson

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**INDEXES** are now available for Vols. I and II of the *Ecologist*. Copies are sent free to subscribers and are supplied with complete runs of the magazine (price £8.50). To other readers, indexes cost 50p plus postage from the *Ecologist*, 73 Molesworth Street, Wadebridge, Cornwall PL27 7DS.

# Books

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## Might is right?

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THE PRICE OF POWER by C. Komanoff, H. Miller, S. Noyes. Council on Environmental Priorities 1972. \$150.

ENERGY RESEARCH NEEDS by Sam H. Schurr. Resources for the Future Inc. 1972. \$13.50.

SOLAR ENERGY FOR MAN by B. J. Brinkworth, Compton Press 1972. £3.50.

The first two books are massive tomes (450 and 870 pp) dealing, in different ways, with the energy crisis of the United States. The books' prices reflect their important difference: *The Price of Power* has been researched and published by a wholly-voluntary body, whilst the second organisation works closely with the US Government.

The three authors of *The Price of Power* have worked extremely hard to take apart the US electric power industry, and analyse its environmental costs. We are given the background to the industry: it has been until very recently one of the world's fastest growing industries, and has the largest capital accumulation of any US industry: \$93 billion. Economies of scale were everything: an "electrocrat" is quoted as wistfully recalling the days when each kilowatt of capacity installed was cheaper than the one before, enabling the industry to grow and grow. However, this economist's dream has now reached fairly absolute limits: by the year 2000 at current growth rates California will require 1000-MW plants at five-mile intervals along its entire coastline.

The authors plunge us further into the environmental quagmire that inefficient electricity generation and assiduously-promoted over-consumption have caused. Air and thermal pollution problems are heavily documented, and the US's fast-proliferating nuclear industry and its problems are

well covered. These range from the obvious to the more subtle, such as the possibility of sabotage, and the use of uranium mining wastes as landfill in low cost housing, with radiation at many times the AEC-permitted level thrown in at no extra cost. The report fails to pursue what must be the most critical problem with nuclear power: how are highly active wastes to be stored safely for thousands of years? In the light of the US's unstable society there must be considerable question of the adequacy of storage security, but the problem goes beyond this; there has long been no decision, as yet, on where long term storage will be undertaken.

In view of nuclear power problems, and the ever-increasing realisation that fossil fuels will soon sky-rocket in price, it would be expected that research into alternatives was forging ahead. The report puts paid to this kind of optimism very quickly: in total the US electric power industry spends less than one-eighth of its advertising budget on research into *all forms* of new energy sources. Ironically, advertising revenue has now to be partly-routed into publicity for ways to *reduce* electricity consumption. One could derive pleasure from the spectacle of a giant growth industry pleading with its consumers to use less—but the stakes are too high. The report concludes with highly-detailed checklists of the pollution characteristics and control measures taken at all the larger power stations in the US, whatever company they are run by. This should surely be something our own environment and consumer groups could aspire to.

In *Energy Research Needs* we see the other side of the coin. This report is written on behalf of big business and government, and it shows! The word "crisis" appears very infrequently, and nearly always is part of an attributed statement, following which "sanity and moderation" are allowed to prevail. We are told that "requirements" are to be taken as synonymous with "needs"—whatever our dictionaries might immoderately claim.

In its factual sections the report is very clear, and obviously very well-informed. But its facts are a rebuff to its constant economic theme. We are shown, in various tables and charts, how very rapidly the electric power industry's use of raw fuel energy has

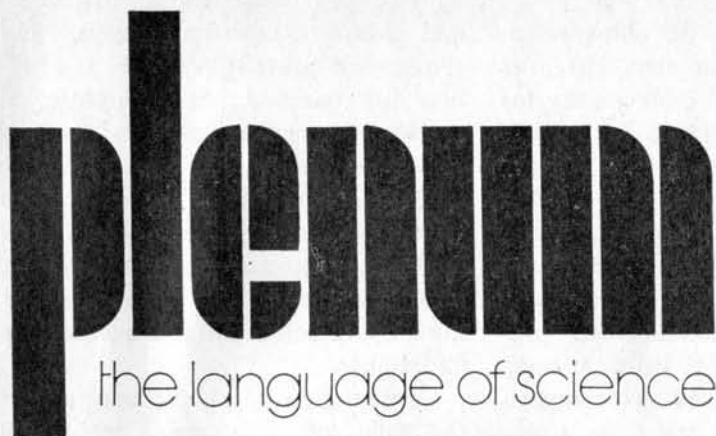
increased—although delivered electricity has not increased by like magnitudes, waste has. In a curious area of this massive and rambling report we are invited to consider zero economic growth. This dragon is soon put to bed by invoking the knight of "recycling" (of what we are not told) who of course will need more energy to clean up the environment, obtain just consequences to imperialist wars, and what have you. To demonstrate the report's valuation of various topics, the section on ZEG and recycling command three pages, whilst a discussion of the price mechanism take up about two hundred. There then follows a discussion of fuels from unconventional sources.

If we expect discussions of new technologies and fuels from, for instance, fermentation and microbial systems, we are on the wrong track. In this report "unconventional" fuels are gas from oil and coal—interestingly enough the energy sources that the German war machine turned to near the end of World War Two. Whilst the process was then very inefficient, it is now merely inefficient; presumably we must be thankful for the "progress" that has taken place. After a brief section in which environmentalists and their claims are rebuffed by, for instance, the claim that thermal pollution may be desirable, we are invited to throw out solar energy. Those with any interest in solar energy will be amazed to hear a person of presumably some repute claim that flat plate collectors are ineffective because a "good cheap black surface" is "not available". Perhaps Mr Schurr does not know that carbon black—soot from his power stations—is an excellent collector surface when sealed by shellac or other sealants.

*Solar Energy for Man* takes us thoroughly but without bruising, through the theory that underlies successful use of the greatest source of non-polluting and free energy: the sun. Facts that we should be well-acquainted with are given prominence: the arctic's summer has as intense solar energy as the equator, and Britain's has 10 per cent *more* energy than this. We are shown why the collection for heating of diffuse and direct solar energy, employing relatively low cost flat plate collectors, is to be preferred at this latitude to concentrative collectors working only on direct sunlight. Thus although we should not expect to

*(continued on page 158)*





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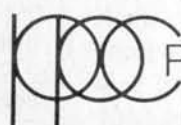
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cook by the sun's light (except occasionally in summer) we can look forward to extensive space and water heating from the sun.

Mr Brinkworth takes us elegantly through the thermodynamics of applied solar energy—showing us that conversion of sunlight to work is inherently more difficult than obtaining heat. While a flat plate collector can collect energy at the rate of more than 400W/sq metre for water heating, it will be difficult to get more than about 80W/sq metre of power from conversion equipment at this (or any) latitude. Thus a 150kW kerbside grand would need 1800sq metres of collector—over half an acre! Even if our cars cannot run on solar energy, though, many things can. One of the most interesting is a solar-driven heat pump. One of these delightful machines can use the overabundance of solar energy in a tropical place to cool buildings, with the heat being jettisoned into water heating tanks: an incredibly elegant use of a low-intensity energy source.

There are many other fascinating topics in this useful book, although more information on collector construction would have complemented the book's thorough consideration of theory. Photographic material includes pictures of flat plates installed in the UK—similar units being available through Low Impact Technology—and there is a tantalising shot of a (presumably) low-power solar boat, but with no reference in the text.

Andrew MacKillop

## English peasants

ENCLOSURE AND THE SMALL FARMER IN THE AGE OF THE INDUSTRIAL REVOLUTION, by G. E. Mingay; Macmillan, 25p. THE BACKYARD DAIRY BOOK, by L. Street and A. Singer; Whole Earth Tools, 40p. EVERYMAN'S NATURE RESERVE, ed. by Eve Dennis; David and Charles, £4.95. THE CELT IN THE SEVENTIES, ed. by F. G. Thompson; Celtic League, £1.

The English peasantry is a fashionable topic among today's social and economic historians. The discussion, naturally, takes the form of a post-mortem—when did the victim die, what was the cause of death, who was responsible? G. E. Mingay's short study is a

good introduction to the controversy; the author has his own views, but gives a very full annotated bibliography for those who wish to pursue the subject further. Small farmers (a term Mingay prefers to the more emotive "peasants") had already declined steeply before 1750: the traditional culprit, the parliamentary enclosure movement, must therefore be pronounced innocent of *this* crime at least. Much may yet be learned by a comparison between England and those European countries where a peasantry still survives.

Most readers of the *Ecologist* would, I trust, agree that peasants are a Good Thing: their low consumption, their devotion to recycling and organic husbandry, even their cultural conservatism recommend them to us as much as their simple piety and rude health did to the intellectuals of the past. "But" (to quote Goldsmith's *Deserted Village*, which deserves to be set text for all environmentalists) "a bold peasantry, their country's pride, when once destroyed, can never be supplied." True enough, in the sense that a revival is never the same as a living tradition: a recreated peasantry, if we ever get one, is likely to be more empirical, sophisticated and self-conscious than the old. But the experiment ought to be made, many times over: on a pessimistic view, to provide the Noahs of a doomed civilisation, or more optimistically as a catalyst for desirable change. These new peasants will need books as a substitute for traditional skills—books like *The Backyard Dairy Book*, which is written, printed and published by neo-peasants for neo-peasants. While this book cannot claim to provide all you need to know to be self-sufficient in dairy products, it is an attractively-produced, enthusiastic and inspiring introduction. All aspects of the subject are touched on, from the choice of animal to the manufacture of cream, butter, cheese and yogurt.

One need not go "back to the land" to find *Everyman's Nature Reserve* stimulating and useful. This is a practical book for anyone in town or country who wants to do more than just talk about improving the environment. It is refreshingly optimistic, seeing possible nature reserves in roadside verges, churchyards, gardens (the total area of the gardens of Britain is equivalent to a county the size of Dorset!),

slag heaps, disused railways, golf courses and gravel pits. There is a section for teachers, on environmental projects with school-children: suggestions for farmers who can spare an acre or two for wildlife: instructions on planting and rearing trees: and a great deal else. There are many contributors, most of whom are able to generalise on the basis of actual projects successfully undertaken.

Conservation of *people* may arouse thoughts of tribesmen in South America or New Guinea: we are strangely blind to genocide when it takes place in our own country. Four centuries ago, the British Isles could boast at least seven native languages; of these, all but one are either dead or fighting desperately to survive. Kill a language, and you kill a people's identity. I believe that monoculture is as bad for human beings as for crops: so I was glad to read, in *The Celt in the Seventies*, of those who are fighting a rearguard action against the uniform society. A hopeless fight, I dare say, thanks more to the apathy of their own people than to the tyranny of their conquerors: personally I find an independent Cornwall almost as improbable, though desirable, a future development as a Peasant Republic of Mercia or Wessex!

Nicholas Gould

## Coming events

3-4 April—Clean Air Spring Seminar, Oxford. Further details from the National Society for Clean Air, 134-136 North Street, Brighton BN1 1RG.

9-13 April—LABEX International, discussion meeting on designing and equipping a laboratory for teaching biology. Further details from LABEX International, 36-37 Fournival Street, London EC4A 1JH.

11 April—Pollution and the Electrical Engineer. A one-day colloquium to be held at Liverpool University. Further details from N. Bett, 6 Edenhurst Avenue, Liverpool L16 2LA.

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# Letters

## Blueprint for survival: Comments:

From Mr F. Ponniah

Sir,

At a broad global level a correct relationship between the over-developed world and the under-developed world is a necessity for the ecological movement.

Macfarlane in the January issue of the *Ecologist* rightly recognises that the most glaring omission in the *Blueprint for Survival* is that the goal set is to be realised politically.

Therefore I perceive two essential conditions for the success of the ecological movement. Firstly an existential phenomenological understanding reflected as public opinion for a reverence for life and a desire for its continuity. This particular point is in the background of an awareness which distinguishes between ecological systems, and those systems connected with demand, of rising expectations. Secondly, that political power is the only means available for the realisation of a programme.

The *Blueprint for Survival* was given great prominence in *The Times* which also recently produced an important leader on "the aims of Christian policy" in the background of the Vietnam cruelties. Common to both themes is a concern for life.

MacFarlane suggests at this stage "some discussion of the more immediate issues of how, within the present political structure of the world nation states, we may set about realising the political goals set out in the *Blueprint*."

However, I feel that at this stage a third world view could be valuable. The ecological crisis heightened an ecological awareness. Historically its roots could be traced to a European obsession for power and the present awareness an event in time. It seems to me that there are internal contradictions that appear to be the driving force of the European mentality. These internal contradictions act as hindrances for a correct relationship between the over-developed world and the under-developed world. It would be valuable to start by focusing the attention of the

establishment to the contradictions between morals and livelihood.

Yours sincerely,

Fitzroy Ponniah,  
The Architectural Association,  
34-36 Bedford Square, London WC1.

From Mr A. W. Thomas

Sir,

I have been waiting for nearly a year now for someone to make the obvious points made by Mr Macfarlane in your last issue, on the political problems of establishing a society capable of surviving; he does this with great clarity but does not go far enough, in my view.

Surely the essence of the matter is this; any world society capable of surviving, whether based on the *Blueprint* or some variant of it, inevitably requires a very great degree of self-abnegation by the developed countries and by the top 33 per cent of people in those countries in particular. Does anyone really believe that the "Western" societies we have created are capable of even a tithe of the self-abnegation required, based as they are on materialism gone mad, the "growth syndrome", a degree of racialism and a barely controlled arms race?

The sort of self-abnegation required, to mention only a few examples, is as follows:-

1. No car engine to exceed one litre, and strict control of private use.
2. Abandonment of the idea of war as a method of policy, and thus of the whole war machine and armaments industry.
3. Widespread rationing of all kinds of goods and services, especially power, at least until the solution of the nuclear waste problem.
4. Deliberate reduction in the Western standard of living to help UDC's.

The great defect of the kind of democracy we profess is that, as politics is about power, no advance action can effectively be taken to deal with looming catastrophes until the first one is staring us all in the face, by which time it is too late. No government can obtain, or retain power if it proposes

to act in time by imposing the necessary restrictions.

This leads to the melancholy conclusion that we shall soldier on, denying at official level, that any threat exists, until a sudden shock brings us face to face with reality and we are in the equivalent of a war situation overnight, in the sense that only authoritarian government can effectively act, and once such a government is in power, it would undoubtedly, in the nicest possible way, initially, see imponderable problems in holding elections. Hence the entrenched minority, and thence to 1984.

A nation can be led only from the top and a peaceful transition to a society capable of survival would require a cabinet and leaders of industry who would have no yachts, fleets of cars, multiple houses, great investments, large incomes, enormous pension rights, but who would be prepared to bike from Downing Street to Westminster, even in the wet if need be.

Such requirements are so hilariously unrealistic, in our present society, that one can only have grave doubts about the possibility of peaceful change.

Yours faithfully,

A. W. Thomas,  
"Cappoquin", Dunchurch Road,  
Rugby, Warwicks.

From Dr J. E. Cordwell

Sir,

I should like to comment at this late hour on figure 1 of *A Blueprint for Survival* (*Ecologist*, 1972 2, (1)) which shows remaining world resources of crude petroleum and (supposedly) the production rate in 109 barrels per year.

The lower curve is clearly in error since it indicates a 1965 production rate of about 200 x 109 bbl/year which is an order of magnitude higher than the true figure. The graph was in fact queried by I. W. Hill (*Ecologist*, 1972, 2, (4) 25) who realised it did not make sense and asked for a correct version to be published. As far as I am aware this has never been done.

Having examined the graph myself, it appears that either the lower curve refers to *total* production up to the year given on the abscissa or that a different scale is required on the ordinate axis for the lower curve. In the former case the two curves should be mirror images (which they are not) and in the latter

case the crossover point has no significance.

Hill also questions whether Ryman's estimate of total oil reserves as 2100 x 109 barrels referred to the amount of oil left in 1967 rather than the grand total from the first use of oil. Presumably the authors of *Blueprint* took this figure from work by M. K. Hubbert (for example: "Energy Resources for Power Production" in *Environmental Aspects of Nuclear Power Stations*, IAEA, 1971) who seems to imply that Ryman meant the grand total. In any case were the growth rate to remain at about 7 per cent per annum it makes only about two years' difference to the date of exhaustion.

Hubbert believes Ryman's figure to be too high and prefers 1350 x 109 barrels. If this figure is correct and the growth rate were to remain at 7 per cent until we completely run out (extremely unlikely) this day would come around 1995.

Yours faithfully,

Dr. J. E. Cordwell,  
60 Parklands,  
Wotton-under-Edge, Glos.

## Re-cycled paper

Sir,

I wonder if you (or one of your readers) may help me. I am looking for a source of recycled paper for some leaflets I am to print. The local factories I know of who recycle paper only produce paper bags, sacks etc. I would be very grateful if you can give me details of any firm which produced paper of sufficiently good quality to be used for printing.

Yours faithfully,

W. K. Whitaker,  
115, Reynoldson Street,  
Newland Avenue, Hull, Yorks.

## Dutch elm disease

Sir,

The Department of Environment is to allow Dutch Elm Disease "to run its course." It probably will. Suggestions to deal with the disease include injection of fungicide and introduction of "benevolent" fungi.

One hopes the benevolent fungi will thumb a lift with the beetle *Scolytus*.

Is it not possible that all measures, so far taken, deal only with symptoms and not causes? Is there not a general,

and now discernible, deterioration of environment that has been developing for a century? Have other tree species suffered, in perhaps less spectacular manner, and not only by motorways gashed through the countryside? I refer to changes in land usage over the past century, including depleted humus, destruction of soil structures, deep cultivation, lowering of water table, and excessive use of soluble fertilisers.

The suggestion is supported by correspondence in *The Guardian* of November 11th and 14th last. The writer had travelled through South Wales, the South West, Wessex and the south Midlands, and claimed to have noticed increasing signs of disease among a number of tree species. After analysing possible causes, including drought, he finally suggested the changes in farming methods and increasing, excessive use of soluble fertilisers, over the past century, with nitrates and phosphates in the soil water, a danger already recognised.

If this correspondent's theory is feasible, the outlook for humanity is unpleasant, if not dangerous, for the countryside, as we know it, is largely man-made.

All this is in line with the conclusion reached 40 years ago by a Shropshire farmer's son turned scientist, who spent 30 years abroad and who learned a lot "from the peasants and pests," as he put it. He claimed that pests and diseases "attack" the weak, the unfit, and were nature's method of censoring life on this planet. If Sir Albert Howard was correct, our pesticides, insecticides, etc., do no more than keep alive sub-standard crops.

At the war's end, Howard claimed ours was a "quality" crisis and that modern methods would fail. They have. In my opinion, the *Scolytus* beetle and fungus *Ceratocytis ULNI* are Nature's censors dealing with a sick species of elm. It would help if investigators now turned to examining areas where Nature's plenty survives healthily, and ascertain why.

S. G. Page,  
6 Churchfield Avenue,  
Sawston, Cambs.

Sir,

I suggest that as much publicity as possible be given to the fact that the order to fell dead and dying trees has been cancelled—nor is there a grant towards the cost of felling.

This means that the trees will increasingly become a blot on the landscape especially when all trees are in leaf. The Environmental Ministry appears to be taking little notice.

Huge sums of money can be made available when politically useful, in spite of great opposition, but rarely otherwise.

Yours sincerely,

M. Parrington,  
Shirburn Mill, Lawford,  
Manningtree, Essex.

## Gremlin

Sir,

Having read your page in the January *Ecologist* I now have a desire to tell you that your style could be improved and the direction of your aim also.

Will you look again at page 9 January? see "Econuts"? the CPRE's endeavour sounds very reasonable to me; do you want acres to be lost? Their statement may be forceful but don't you think that is necessary?

See "Zuckermania"? You have stated that RTZ is a conservationist company. Sir Val Duncan can now say, "Even the magazine which takes the greatest interest in the environment freely prints that we are conservationist-minded."

See "Plan your family?" Don't you think that any gimmick, slogan, name or mnemonic which helps to make birth control more fully effective is a good thing and not to be sneered at?

I think that your sarcasm is not only in poor taste, it also gives the *Ecologist* a bad name. More power to the Family Planning Association,—effective power that is, of course.

Bye Bye now.

Yours sincerely,

V. J. Snelgar,  
1, Appleton Road, Catisfield,  
Fareham, Hants.

P.S.

You might like to tell N. Gould of "Gulliver", also, that people may be wary of a man carrying a stick and that—up to a point—the wariness varies with the size of the stick; but beyond that point the wariness diminishes and when the stick is the size of a telegraph pole the wariness changes to derision.



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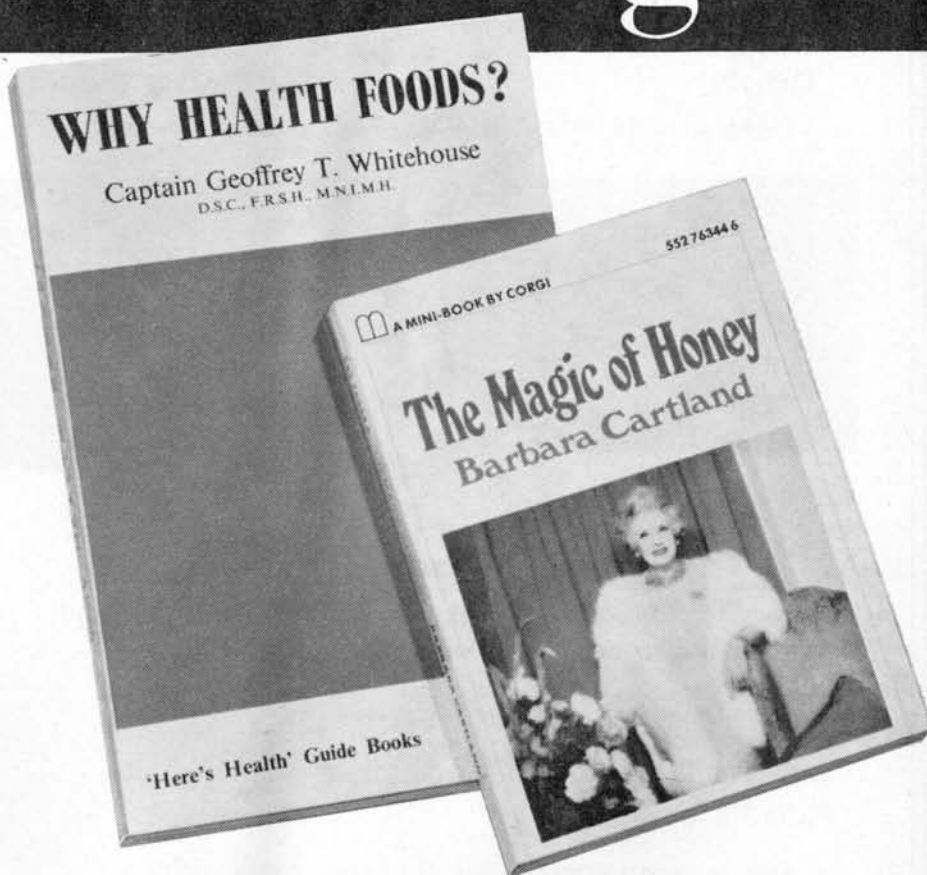
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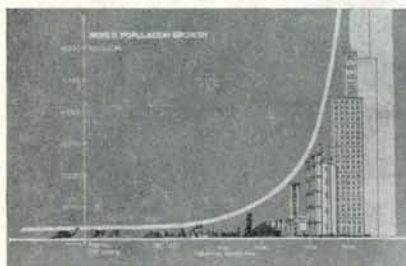
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