

# Ecologist

The Journal of the Post Industrial Age

Vol. 5 No. 4

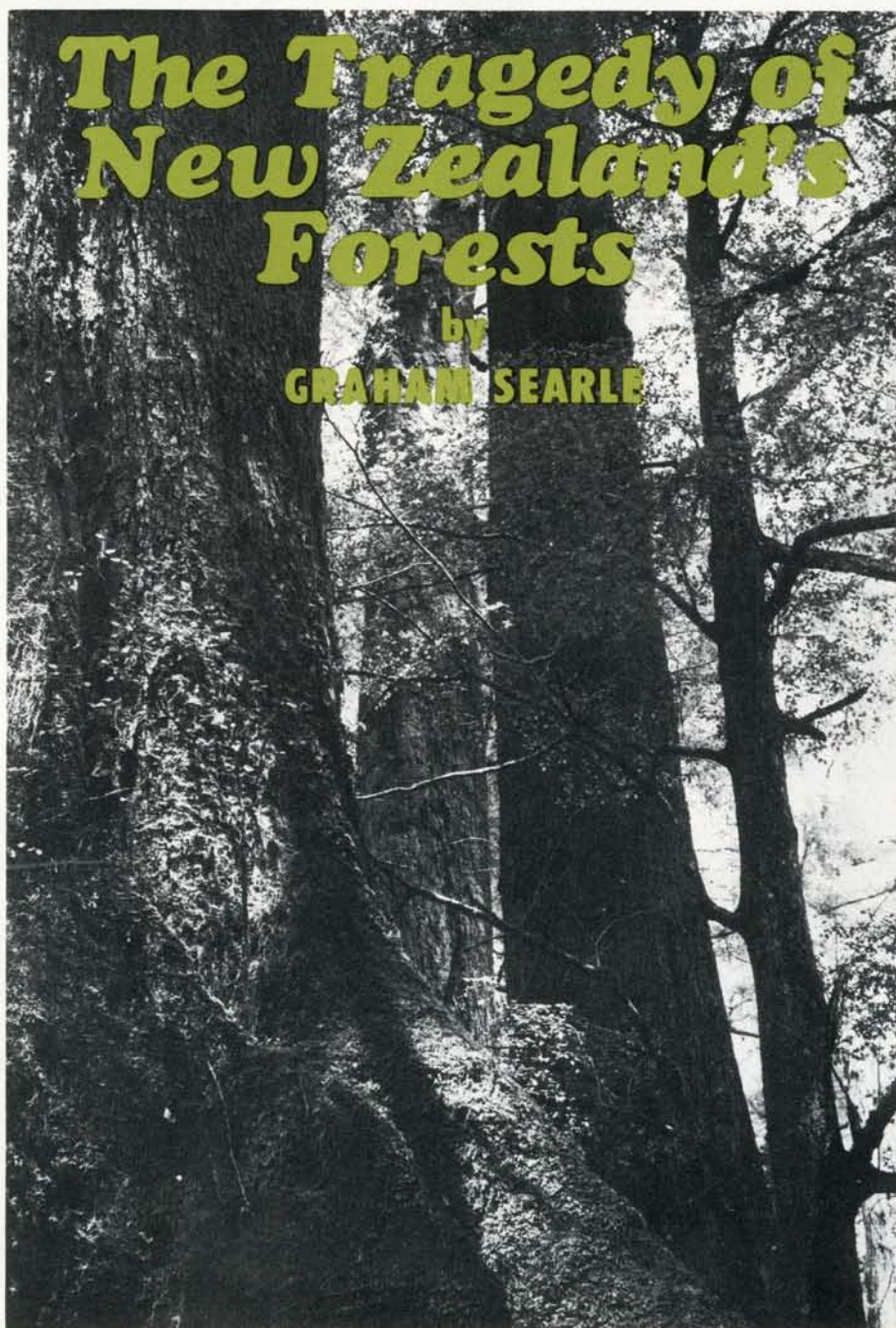
May 1975 40p

**THE ENGINEER AS SOCIAL RADICAL THE TWO FACES OF NEW GUINEA  
CAN THE THIRD WORLD AFFORD ITS SUPER-ELITE?**

## **The Tragedy of New Zealand's Forests**

by

**GRAHAM SEARLE**





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# In this issue

Vol. 5. No. 4. May 1975

COMMENT		
Edward Goldsmith	The Two Faces of New Guinea	114
ARTICLES		
J. C. Mathes Donald H. Gray	The Engineer as Social Radical The engineer is often a conservative and would be horrified at the thought of the social changes his activities must inevitably bring about.	119
Graham Searle	The Tragedy of New Zealand's Forests Among the most beautiful in the World . . . they are being systematically devastated.	126
Allan Rodger Goran Backstrand	Can the Third World Afford its Super-Elite? Created by western influence the elite is inexorably causing further undesirable westernisation.	136
C. Richard Tracy	The Inaccuracy of World Crop Data Modern science is data mad, but data — (certainly in this field) — are very shaky indeed.	134
Richard Carder	An Ecological Calendar	133
REPORT		
Roger Gomm	Nutrition and Anthropology Conference	141
BOOK REVIEWS		143
LETTERS		145
This Month's Authors		147
Classified Advertisements		148

Note: While every care is taken with manuscripts submitted for publication, the Editors cannot guarantee to return those not accepted. Articles published in the Ecologist do not necessarily express the views of the Editors.

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This month's cover: A Magnificent stand of Red Beech. Photo: D. Harding.

All communications should be sent to: The Ecologist, 73 Molesworth Street, Wadebridge, Cornwall PL27 7DS, England.  
Tel: Wadebridge 2996.

Advertising enquiries to Interpress, 19 Anne Boleyn's Walk, Cheam, Surrey. Tel: 01-642 5826

Published by Ecosystems Ltd.

Registered Office as above.

Distributed by: A.M.D. Ltd., Roding Trading Estate, London Road, Barking, Essex IG11 88U.



# Comment

## THE TWO FACES OF NEW GUINEA

It is doubtful if any of our political leaders have ever seen a political document which actually takes into account social and ecological realities. Such a document would undoubtedly be regarded as 'politically naive' as was our *Blueprint for Survival*, as its implementation would not provide a means of winning votes.

Nor would any of their advisors be likely to write such a document. They tend to be fervent adepts of the Religion of Industrialism which preaches that the world is imperfect, but that man, with the aid of Science, Technology and Industry can create a far better one.

This anti-evolutionary doctrine leads its adepts to wage an all-out war against Nature, and the role of our experts is simply to determine what must be the next stages of this pathetically unequal struggle, what particular processes of the biosphere must be singled out as the target for the next assault, how we should deploy our regiments of chemists, nuclear-physicists and engineers, and what ingenious new weapons can be added to their armoury.

However, a new generation of scientists is arising. It is increasingly aware of the limitations of modern scientific method, increasingly concerned with the problems of values, and increasingly willing to admit that technology does not provide a panacea for all human problems. A few politicians are also beginning to suspect what King Canute pointed out to his sycophantic experts over a thousand years ago, that the forces of nature are indifferent to the edicts of politicians. It may be inexpedient to be politically naive but

to be socially and ecologically naive is suicidal.

Unfortunately, the old-fashioned experts who have not yet understood all this are still very influential. In Britain, Beckerman is still convinced that the world obeys the laws of Keynesian economics, Zuckerman told Mr. Heath, then Prime Minister, that Britain does not have a population problem and Lawther still assures the government that air pollution levels are quite tolerable, in spite of the fact that we have the highest levels of bronchitis, emphysema and lung cancer in the world. Our politicians are also mainly of the old school. Like the Bourbons they have neither learned nor forgotten anything. The Conservatives still regard free enterprise as a means of solving all our problems, the Socialists nationalisation, and the Liberals go on waffling about 'human dignity' and the 'rights of man'.

Some of the new nation states are more fortunate. Two of them, Zambia and Papua New Guinea actually have Associate Editors of the *Ecologist* as Government Advisors, John Papworth and Jimoh Omo Fadaka respectively.

The latter was appointed by Maurice Strong as part of the United Nations Environment Programme. His initial report to the Government of Papua New Guinea must be one of the most enlightened political documents to appear since the beginning of the industrial age.

Fadaka accepts that, like all countries today Papua New Guinea wants to develop. The question is how? So far the principal influence in this field has been that of Australia, whose government administered this area for a very long time. This approach is:

"Foreign to the indigenous cultures and traditions of the people of Papua New Guinea.

For example the principle of the centralised nation-state, capitalist economy, social institutions, capital-intensive or labour-saving technologies are all foreign importations which are difficult to reconcile with Papua New Guinean indigenous traditions and cultures.

Papua New Guinea should not imitate the Australian pattern of development. It should adopt a pattern of development suited to its traditional cultural patterns. It should pioneer its own way — the rural way as opposed to the urban way — of development which avoids the economic and social pitfalls of the Australian pattern of development".

The maintenance of New Guinea's cultural traditions is the first priority. The 700 different societies that constitute this new state must be able to maintain their different identities, they must be "allowed to develop separately without fear of domination of one group by the other". At all costs these people must not be transformed into an alienated proletariat on the Western model.

To create a Western type economy would be undesirable for yet another reason, and that is that it simply doesn't work. As Fadaka writes:

"Many industrialised countries are now faced with complete breakdown as a result of these large projects. They are faced with serious social disruption leading to high incidence of mental diseases; suicide and crime, especially in the cities,



alienation of people from one another, social and psychological breakdown of their societies; drug addiction, and a sense of hopelessness arising from these huge projects, and destruction of their environment.

Many people in these countries especially the youth, are looking for a different life-style; simple and humane; completely different from the present atomistic and highly centralised society they have inherited.

Papua New Guinea should learn from the mistakes of these countries and try not to repeat them. If it tries to imitate their pattern of development, it will end up with the same problems, without having solved its own. The result would be disastrous for Papua New Guinea.

Large scale schemes such as the Purari Water River Project that are being presently considered should *not* go ahead until all the relevant facts are known. What for example are likely to be the effects of the project on rural communities; the physical environment, the ecosystem, etc? Is there a viable alternative?

Papua New Guinea should not attempt to transform its society through such huge industrial projects which would subordinate its rural population to foreign monopoly capital and (perhaps) ultimately destroy the rural population".

Even if Western Industrialism worked, for Papua New Guinea to try to adopt it would require a very considerable amount of foreign aid. However, aid programmes are unfortunately double-edged; they will make Papua New Guinea even more dependent on the donors. Self-reliance is a pre-requisite of economic stability, and in order to achieve it, dependence on foreign aid should be reduced rather than increased.

The development of the spirit of self-reliance should be an important aspect of the economic policy of Papua New Guinea. It should do things itself, and should, as far as possible, do without foreign aid or assistance.

If aid is necessary at all, it should be related to the *actual needs* of the country, and not the needs of the donor-countries.

At any rate a good many undesirable things come into a country on the back of aid. Aid often creates a psychological dependence on getting still more aid. It saps initiative and enterprise; or again, aid may foster — as it has been doing in Papua New Guinea — a type of development wholly inappropriate to circumstances.

"Aspirations are created which can never be fulfilled. The Western or Eastern *"expert"* wants to bring his whole cultural baggage with him and this can include myths about what happens and what is possible in his own country.

Moreover, no one in a position of power and prosperity can offer such aid as would threaten his own security".

Trying to imitate the West would also mean attracting foreign capital.

But how is it possible to control a society if it is economically dominated by foreigners? As Fadaka writes:

"It will be difficult for Papua New Guinea to initiate the type of development that will solve its poverty problem when the industrial machine it has to contend with is mainly in the hands of foreign companies. It is unlikely that these can be persuaded to subject their purely economic considerations to indigenous needs.

They are, for instance, unlikely to introduce labour-intensive small-scale technologies. They seek above all to be internationally competitive, and if local conditions do not permit this, they will simply tend to move off to greener pastures. Many of the companies are involved in activities which by their very nature can only be of short duration, when there is no copper left in Bougainville, for instance, they will move elsewhere".

*Edward Goldsmith.*

## THE SOIL ASSOCIATION 1975 *BIOLOGICAL HUSBANDRY COURSE*

The fifth one-week course entitled "*A BIOLOGICAL APPROACH TO SOIL HUSBANDRY*" has been arranged by the Soil Association and will be held at Ewell County Technical College, England from July 7th–11th, 1975.

This unique course has been planned to provide a balance between a simple scientific introduction to soil biology and the practical application of organic farming methods. It now includes guidance on small scale husbandry. The course will be conducted in English and a visit to an organic farm or market garden is included.

The course fee of £22 covers the cost of tuition, two meals per day, and morning coffee and afternoon tea. Landlady accommodation can be arranged through the College or students may arrange their own accommodation.

Further information and booking forms from:

Mrs. J. Griffith-Jones,  
Projects Secretary,  
The Soil Association,  
Walnut Tree Manor,  
Haughley,  
Stowmarket, Suffolk, IP14 3RS,  
England  
Tel: HAUGHLEY 235

Dr. A. Deavin,  
Research Director,  
Ewell County Technical  
College,  
Reigate Road,  
Ewell, Surrey,  
England  
Tel: 01-394 1730/9



Britain is in precisely the same situation today. We can only maintain our industrial society by attracting vast amounts of foreign capital, mainly from the Arab countries, who, with present oil royalties can afford to buy the whole of British industry every few months. But for how long would this country tolerate being owned by the Arab Sheikhs? The Labour Party we must not forget cannot even tolerate its being owned by individual Britons.

What then must be done? As Fadaka puts it:

"The transformation of Papua New Guinea society *must* come from a common and spontaneous enthusiasm, and not a series of alien directives. Papua New Guinea must strive to control its own destiny within a self-reliant society. Furthermore, self-reliance will encourage the use of the country's most abundant resource — *manpower* — as a substitute for scarce capital goods. A policy of 'turning labour into capital'.

It is within this framework of self-reliance that Papua New Guinea should reconstruct and control its destiny".

He then examines in considerable detail different aspects of the development process.

#### *Technology*

The technology resorted to, he writes, should:

"be a type consistent with the maintenance of a healthy self-reliant, self-supporting, self-regulating and self-financing human scale society at village or community level. It should have the lowest impact on ecosystems and should enhance rather than disrupt the life of rural communities.

It should be designed for relatively 'closed' economic and political communities at village and community level; be cheap and available to everyone in the village rather than a privileged few; be suitable for application on a small scale. It should be designed in such a way as to

provide villagers with the means of doing profitable and intrinsically significant work; of helping them to achieve independence from bosses so that they become their own employees or members of self-governing co-operative groups working for subsistence and local markets.

It should be labour-intensive, to reverse the trend towards increasing unemployment and be capable of being reproduced locally, thereby encouraging indigenous industries.

There should be a new type of literature for the rural population — literature on ecologically-based low-impact technology for support of small-scale village communities. Such literature should contain information on low-cost building materials; low-cost dams; low-cost energy, e.g. wind, water, solar and other renewable energy uses; low-cost medicine; low-cost transport; labour-intensive methods; workshop technology and all those things which the village needs to be self-sufficient, self-reliant and largely self-governing".

Once more the lesson is as applicable, if not more so, to industrialised countries such as the UK as it is to the traditional societies of Papua New Guinea — whose primitive culturally-determined technologies have always satisfied these requirements admirably.

#### *Education*

Among his recommendations, on the subject of education, one notes the two following essential points:

"The villagers should run their own primary, secondary and training schools and research stations, with government assistance if necessary.

The education given at village schools should be designed to enable the pupils to continue to work in the rural areas, instead of drifting to the towns".

Indeed, centralised educational systems have been a serious cause of social disruption and alienation in the West, while one of the causes of urbanisation is that people in rural areas are educated specifically for an urban life.

#### *Housing*

On the subject of housing he writes:

"The villagers should be encouraged to build new low-cost houses communally. By this means houses in the villages cannot be sold when individuals leave the villages".

This would undoubtedly do much to reduce undesirable mobility which prevents the establishment of those bonds which normally hold a community together.

#### *Politics*

On the subject of Politics, the accent is on self-government, with a minimum of bureaucratic control. Thus he writes:

"The villages need to provide educated people and trained village cadres, teaching and working with villagers.

What should be avoided is the wholesale importation of people from other villages or officials from outside the area or areas, even from Provincial or District Headquarters, instructing the villagers as to their tasks but taking no physically active part in it themselves".

His approach to Land Management is based on sound ecological considerations. Among his recommendations, we read:

"Papua New Guinea has vast areas of fertile land that are being gradually destroyed either through monoculture and exclusive use of chemical fertilisers or lack of proper irrigation and good land management.

Apart from the fact that chemical fertilisers and pesticides are very costly, their indiscriminate use could destroy the fertility of the soil on which food production depends.

It is very essential that the soil should not be depleted of certain types of plant food. Consequently rotation of crops is essential.

If it is necessary to protect crops from insects, pests and diseases, it is advisable to plant different types of crops at the same time. This could assist in controlling pests and diseases for



the obvious reason that different crops are subject to different diseases.

Also an integrated control combining biological predators and low toxic chemicals could be used.

Herbs and spices could also be planted and used to keep pests away.

It is impossible to exterminate all pests and it is a waste of time and money attempting to do so with pesticides which could destroy the soil and its beneficial organisms.

Management of the land is very important. Sloping land should be terraced to stop wasteful erosion. The terracing could be done by using draft animals such as water buffaloes; simple implements; proper drainage and local materials such as stones, and bamboo".

What would be the main characteristics of the society which would emerge?

Fadaka writes:

"The type of society Papua New Guinea should envisage should comprise a conglomeration of self-supporting communities based on the various ethnic groups or communities or national groups as in its traditional society, as far as is possible or practicable.

This is the goal towards which Papua New Guinea should be striving — an organisation of stable, self-governing, self-reliant and self-financing human scale Communities enjoying that life-style prescribed by their own traditions, customs and beliefs".

Underlying this report is a rejection of the principal values of industrialism. The notion of development itself has not been abandoned, but the form of development envisaged which is largely subject to the constraints that must be applied on human activities for them to satisfy basic social and ecological requirements.

One can only hope that it be heeded, and it serve too as an example to other governments throughout the world, both of the industrialised and as yet non-industrialised countries.



#### A Faceless Society

The other side of the Island of New Guinea is occupied by the Indonesians. Though they themselves have only recently obtained their independence from the Dutch, they have not hesitated to subject their new subjects in New Guinea to the worst abuses of colonial rule.

Robin Hanbury Tenison, Chairman of Survival International, recently visited a valley in this part of the Island in which lives a tribe called the Dani, 6,000 of them whose very existence was not suspected until 20 years ago. They are very happy and prosperous people but possess none of the paraphernalia of industrialism, no Cadillacs, colour television sets, electric toothbrushes, no modern hospitals and comprehensive schools, no all-pervading State Bureaucracy, and no Nation State. Most of us would regard them as fortunate to have been able to escape the terrible ravages of the industrial age. Not so however, their Indonesian overlords, who regard it as their divinely inspired duty to bring them as rapidly as possible the full benefits of progress of which, so far, they

have been so shamefully deprived. In this way, rather than allow the different tribal societies to retain their identity, they are to be systematically swallowed up into a faceless mass society.

I shall quote from Robin Hanbury Tenison's new book *A Pattern of Peoples*.\*

"Wamena is not an attractive town, the straight rows of corrugated iron roofs looking out of place in the magnificent setting where blue mountains sweep down to the valley floor, through which the wide Baliem river curves leisurely before plunging into the narrow gorge sealing off the eastern end. We stayed the night there, talking to a young Austrian agriculturalist working on a project for the Catholics. He was full of praise for the Dani as farmers. The soil is rich and they work it skilfully, digging long ditches for irrigation and drainage, and allowing the land to lie fallow between croppings. He felt that the sweet potato, which is the staple diet of the highlands, was a much maligned source of food.

\**A Pattern of Peoples*. To be published by Angus and Robertson in June at £4.20.



ten to twelve per cent protein. They grow magnificent cabbages and other vegetables. If they were not prevented from selling these in Jayapura they would have a perfect cash crop, and could buy the things they see in the market but have no money for. He felt that great danger lay in the removal of the remaining areas of forest, as increasing numbers of military personnel were brought in who used the timber for their houses and barracks. Soon there will be no trees left in the valley. Flying in, I had noticed how few clumps of woodland there were, but instead bare hillsides contrasting with the neat garden plots and round thatched villages. From the air, it had looked more like a high Alpine valley in Switzerland than the 'primeval jungle' we had been led to expect. No replanting is being done, and promoting this would be an easy way for the government to bring real help to the Dani. Instead, all the emphasis has been on 'operation Koteka',\* a plan to clothe and civilize the Dani, so paternalistic, ill-conceived and puritanically prejudiced in its priorities as to make one gasp that it could have been drawn up in the twentieth century. But I have a copy of it and, rather than comment, shall simply provide a few quotes so that the reader can see what I mean.

'Socioeconomic conditions among the inland inhabitants are distressing. They live on the products of nature they gather briefly every day, and on the produce of their

\*The term Koteka refers to penile sheaths which up to now have been the sole garment of Dani men.

primitive cultivation, shifting from one place to another.

The inland communities are a relatively easy prey to influence from separatist groups campaigning against the government of the Republic of Indonesia, due to the unsatisfactory social conditions and the pronounced tribalism of the people.

The people remain strongly attached to tribal traditions and customs. This attachment constitutes an impediment in our effort to lead them on the path of development, of social unity and progress in living standards.

The chiefs who are, at the same time, warlords, leaders and guardians of tradition and culture, occupy a central position in the tribes.

Their housing is extremely poor. Huts are built of tree poles with thatched roof, primitive structures with no attention given to hygienic or aesthetic factors. The people sleep on the floor, on a bedding of grass, around the fireplace for protection against the cold.

Our objects include teaching the people the importance of having decent living accommodation according to normal village standards, as well as to build houses using locally available materials . . . to understand and be willing to carry out their duties and responsibilities as family heads and mothers of the household, for children and descendants . . . to dress neatly, to cultivate plantations, to care for their animals, to use Indonesian in a limited way, to sing

Indonesian songs, to know the names of the Indonesian islands, to cook their food, etc. . . .

Having achieved these objects to form a village and large community, so as to facilitate the work of officials in guiding and influencing the people toward the attainment of the main objective and, at the same time, to render government administration easier."

Dom Moreas, writing in *The Asia Magazine* (March 1972) about the Baliem valley, sums up Operation Koteka.

"Its aim, in fact, is to change the Dani whether they like it or not, though the Indonesians don't think of it like that. They will deliver trousers to the Dani in much the same mood as that in which Saint Paul delivered the Epistles to the Lacedemonians . . . It is bound to be enforced eventually. Money will come into the valley with clothes. The old free life will be finished, and . . . (the Dani) . . . will become another backward race looked after by a supposedly paternal administration. More children will attend more schools: but what will they learn there which will be of any use to them if they continue to live in the valley?

Possibly quite a lot, as the valley changes: but the happiness one feels in the Dani now will have departed, it will have flown beyond the mountains, and nobody will know where they can find that blue bird a second time."

Edward Goldsmith





# The Engineer as Social Radical

by J. C. Mathes & Donald H. Gray

## *Editor's Foreword*

In this article Drs. Mathes and Gray make a most important point, which appears to have escaped the attention of most people today. Social changes are rarely brought about by conscious political decisions, but occur simply as a natural consequence of actions undertaken by us for totally different purposes.

Thus, as Mathes and Gray point out, the engineer who is often a conservative and traditionalist has probably had more effect on the transformation of society than anyone else. Also he has caused it to change in a direction which he would undoubtedly disapprove of. He is in fact one of the principle architects of the "Progressive", Egalitarian, and anti-traditionalist world of today.

The principle involved, however, has wider applications. I feel that Mathes and Gray would agree that our Scientists, simply by making new information available are also, often irremediably, altering the face of society and of course of the environment in which it lives.

There is no point in stating, as scientists are prone to, when put on the defensive, that science is neutral. It cannot be — since it can be predicted with confidence that new information will tend to be made use of, if it can lead to "economic" or politically expedient undertakings — and it is as much a part of the business and responsibility of scientists to make such predictions as to collate the information in question.

Similarly, businessmen, by building ever more gigantic capital-intensive factories, are also transforming society. Indeed, this must lead to the disappearance of small local enterprises and the creation of a proletariat, whose increasing militancy will give rise to conditions which are ever less favourable to the continuance of their activities.

Finally, our Conservative politicians whose *raison d'être* appears to be the maintenance of social traditions, are, by acting as a catalyst to the industrialisation process, systematically increasing the number and militancy of their opponents.

Indeed regardless of their public utterances and of their personal motivations Mrs. Thatcher, Mr. Heath and company are not conservatives at all. They are, in effect, as radical and as socialistic as are all other politicians who pursue the same economic ends.



pared to all previous changes in history. In the last century, we have increased our speeds of communication by a factor of  $10^7$ ; our speeds of travel by  $10^2$ ; our speeds of data handling by  $10^6$ ; our energy resources by  $10^3$ ; our power of weapons by  $10^6$ ; our ability to control diseases by something like  $10^2$ .”<sup>2</sup> At the time of the American Revolution 90 per cent of Americans were in agriculture. Today, due to modern techniques, less than 10 per cent are.

The combined effect of such technological development is so enormous that Kenneth Boulding asserts that mankind in the short span of the twentieth century is undergoing a transition as profound as the transition from pre-civilized to civilized society initiated somewhere past five thousand years ago. This second “great transition involves changes in moral, religious, and aesthetic aspects of life just as much as it involves changes in our knowledge and use of the physical world. It involves, for instance, change in the nature of the family and in the patterns of child rearing.”<sup>3</sup> Scientific and technological development is having such a profound impact on modern society that social institutions, cultural values, and personal life styles are being radically and irrevocably changed. The engineer, consciously and unconsciously, is the architect of this totally new civilization.

The conservative realizes what is going on, and believes the social processes of a pre-technological society should be preserved. Russell Kirk states their fears: “Certain great blind tendencies in modern technology and economic life . . . threaten traditional community — the centralization of production and distribution, the decay of rural patterns of living, the excessive mobility of population, the standardization of amusements and customs, the well-meant (though mistaken) drift in many quarters toward consolidation of local political . . . functions into state and federal bureaucracies.”<sup>4</sup> In opposition to these tendencies, the conservative “puts his special trust in tradition, continuity, and stability.”<sup>5</sup> The conservative be-

lieves in a hierarchy of social organisations in the spontaneous growth and grouping of social forms that give the individual a field for expression and activity.”<sup>6</sup> The individual is particularly dear to the conservative because “the vigor of civilization is dependent on people who are guided by some internalized system of value and who are thus capable of initiative and self-reliant behavior.”<sup>7</sup> The verbal concepts in these passages are particularly inter-

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**The engineer compared with the liberal, is the real radical because of the massive and profound social changes he causes as a result of introducing new technology.**

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esting because most are more compatible with the processes of a stable natural system than with the processes of a dynamic socio-technological system.

In other words, technology enables — and requires — the tendencies conservatives fear. Thus engineers are instruments of technological development changing our society so radically that the conservative image of life soon will be untenable. Technological development affects society, human needs and desires, and individual values as well as our encompassing cultural value system. We do not need to take sides in the argument over social change to realize how important it is for engineers to realize they are creating a radically new future, not preserving the forms of the past.

### **The Effects on Societal Structures**

To clarify the societal implications of the engineer's activities we can look at the effects of technological development on society in terms of 1) the distribution of power and decision-making in society, 2) personal-community relationships, and 3) family structures.

Concerning distribution of power and decision-making, the conserv-

ative argues that “so far as possible, political power ought to be kept in the hands of private persons and local institutions. Centralization is ordinarily a sign of social decadence.”<sup>8</sup> Whether or not a cause of social decadence, technological development as experienced in this country requires centralization of power to be used efficiently, or even at all. The concept of “economy of scale” in technological projects is well known. The cost efficiency of nuclear power, for example, is strongly affected by the size of the reactor facility. The bigger it is, the cheaper the unit cost of electricity. Many other public utilities appear likewise affected, from provision of water supply to treatment of sewage. To achieve economy of scale requires a large degree of centralized control or decision-making authority in order to enable a technological system to function efficiently. For example, optimal operation of the system, some central authority — crossing township-city-county and even state boundaries — must be able to shunt power from one section to another to even out load and maximize use of capacity in each part of the system. This makes good sense technologically, but the socio-political consequences alienate conservatives. Local autonomy and power of decision must be relinquished. The professional activities of most engineers in the United States today probably contribute to the centralization of power necessary for the operation of sophisticated socio-technological systems.

Concerning personal-community relationships, we can trace further implications of this tendency of technological development to require as well as to establish inter-relationships throughout our society. To the individual these inter-relationships mean loss of “community.” Loss of community is manifest, for example, in the job mobility and professional commitment engineers and managerial persons are noted for. Most engineers are being educated for positions any place in the country, and most will change jobs several times. The commitment of the engineer is not



**M**any persons today would like to control technology and use it more effectively and humanely than in the past. But when they attempt to explain how to do so, they frequently end up talking at cross purposes. A good reason is our failure to understand the behaviour of the technologist — in most instances, the engineer himself. Indeed the engineer often works at cross purposes with his social values and self image. Both society and the engineer need to be made aware of the engineer's role and impact on society. A dichotomy exists today between the reality and the perception of that role. In a very real sense, the engineer is the social radical today. Until we realize the radical component of the engineer's activities, our society will not be able to guide technological development effectively.

Guiding technosocial development effectively is not a matter of being for or against technology, which is the form the discussion usually assumes. Instead, it is a matter of guiding technological development to avoid unanticipated and undesirable side effects, and counter-productive interactions with societal parameters. The interactions of technology with society are our concern here. They are complex as well as quite unclear, and therefore are difficult to manage. Part of the difficulty stems from the fact that social values and institutions often oppose specific technological developments. For example, efforts to implement infra-red satellite sensing of regional pollution patterns are impeded by local governments, opposed by economic institutions, and challenged by civil libertarian interests. A particularly relevant example is the effort to establish a regional sewage system in South-eastern Michigan for both technological and environmental reasons. The regional sewage system is being opposed by various local governments and citizen interest groups concerned about local autonomy and quality control. In cases such as these, and indeed for almost all significant technological development envisioned for the future, the interactions with societal factors need to be anticipated and

the roles of the technologist co-ordinated with those of societal institutions, social groups, and individuals. Inaccurate perceptions of those roles impede mutual attempts to co-ordinate them.

To help achieve such co-ordination both the technologist and society at large must realize the engineer is the social radical. The typical engineer, however, perceives himself as a social and political conservative — and indeed society thinks of him as such — that is, as manning the barricades against movements for social change such as the New Deal or the Great Society. These movements are opposed by the real conservatives. Russell Kirk says, "The conservative, truly, represents the feeling of sympathy with the past, the forces of permanence in society; the liberal, the feeling of glory in the future, the forces of

change in society . . . It is the liberal who desires radical alteration of the existing order."<sup>1</sup>

Ironically, the liberal's desires are the engineer's actions, even though both the liberal and the engineer would have a "gut reaction" that the engineer opposes radical alteration of the existing order. The engineer, compared with the liberal, is the real radical because of the massive and profound social changes he causes as a result of introducing new technology.

### **Technology Creates Profound Change**

We must have no doubt about the types of change technology has brought to the twentieth century. John Platt observes, "we do not often stop to realize how large (the changes) are in order of magnitude, or how rapid and enormous com-

## **The Pye Research Centre**

Located in rural Suffolk, the Centre's facilities include the three contrasting sub-farms (Organic, Mixed and Stockless Sections) designed by Lady Eve Balfour and Miss Alice Debenham in 1938 and later formed by the Soil Association until Mr. and Mrs. J. A. Pye founded the Pye Research Centre as a registered charity at the end of 1971.

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to a community of personal and human relationships. We live in a mobile society, and prize our mobility, our ability to go anywhere and function as before.

Our common culture permits this. Urban characteristics are repetitive — the neon strips in Ann Arbor hardly differ from those in Pittsburg and San Diego; the subdivision houses in those cities are interchangeable, except for a minimum of insulation and a lack of storm windows in San Diego houses. The commonness of our culture and the mobility we have leads most urban and suburban Americans to form few if any lasting personal relationships with their neighbors. The automobile, television, and altered life styles of eating and leisure mean engineers, no less than most of our society, remain relative strangers in their neighbourhoods. How many of us stop to realize that "for most of man's history, group life was given, and grew naturally out of the ways we were forced to be with each other — to live, work, wash clothes and die?"<sup>9</sup> Because of the impact of technology, people

today no longer live in modes which breed the distinctive ambience of custom, tradition, and personal interdependence that creates the traditional community.

When you see a nineteenth century play you sense this community. Do you recall that strange assortment of characters in Chekhov's *Three Sisters*? They have nothing in common, yet there is a sense of community that lends their lives value and even dignity. Contrast this to the homogenized indistinction of the cocktail party, backyard barbecue associations of our suburban culture. The value and dignity most Americans can experience is not contingent upon custom, tradition, and community. The loss of community, and the consequent alienation of us all from each other, may be a more significant impact of technological development on our lives than the impacts involving pollution and the other problems usually associated with technological development. The significance of the loss of community may be exceeded only by the significance of the impact of

technological development on family relationships themselves.

Concerning family structures, almost every American family is aware of the impact of technology. The conservative feels "that the family is the natural source and core of any good society; that when the family decays a dreary collectivism is sure to supplant it."<sup>10</sup> Whether the decay of the family leads to collectivism or enhances individualism, it does appear to be occurring due to the impact of technological development. Ralph Keyes observes that "our household conveniences — our whole drive for a convenient life — have cut us off from each other. The co-operation and communication that used to accompany life's chores is being built out of our social systems. Eating . . . has become less and less a family affair." He quotes nutritionist Marge W. Jerome, who says, "The structure, timing and ordering of meals (and snacks) as traditionally defined are yielding to individual patterns of food use."<sup>11</sup> In a sense, we can say that the family has become atomized as a result of



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the impact of technological devices, conveniences, and values on home life.

Once the family becomes atomized, it no longer performs its traditional function of stabilizing and preserving society. An early impact of the change and mobility in modern America was to reduce what anthropologists call the extended family to the basic nuclear family unit — parents with pre-college age children at home. After the children leave, the parents have the long distance phone call and the quick visit for a few days to look forward to. Even that lingering remnant of family value may disappear, as we can observe today in the changing nature of the institution of marriage. The evolving form of marriage seems to aim at what might be called “self-actualization” of the persons. Such a form certainly will be different from the traditional form of marriage as a social institution, as the acceptable model for human relationships. Margaret Mead conjectures that in the future, responsible use of technology to enable man to control his biological functions (e.g., artificial insemination, extra-uterine gestation) could create a “social style in which parenthood would be limited to a smaller number of families whose principal function would be child rearing; the rest of the population would be free to function — for the first time in history — as individuals.”<sup>12</sup>

### The New Individual with New Values

Because of these effects of technological development on societal structures, the freedom envisioned will be at the expense of certain attributes conservatives associate with “individualism.” The individualism bred by a technological society must not be confused with the “self-reliant” individualism so dear to the conservative, as portrayed graphically in the heroes of Ayn Rand’s novels. The truly self-reliant individual hardly exists today because of the radical impact of technological development on human needs, desires, and motivations as well as on human values.

Perhaps the most distinctive impact of technology on human nature has been to neutralize the individual’s will power and self control. Traditionally, maturity has been defined as that state where the gratification of need or desire can be delayed or controlled. We expect mature persons to exercise self-restraint in satisfaction of the pleasure-seeking principle — for example, sexual desire. Techno-

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### Technological development has encouraged what we might call instant gratification of desire.

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logical development has encouraged what we might call instant gratification of desire. This, of course, is made possible by birth control technology. But in a comprehensive way it fundamentally is a matter of a new hedonism. There are few of us, and certainly very few engineers with the salaries they command, who couldn’t be in the Bahama islands almost instantaneously. Our new sense of values makes this seem not only right, but a necessity. Our reactions to the “energy crisis” significantly reflect these new values, so much so that our societal responses to the crisis probably will be counter-productive in the long run. Images of consumption, of gratification, dominate these responses, and so probably will create new energy-related problems which will seem even more severe than today’s.

Most of the technological development directly affecting the individual addresses pleasure and ease. Look at ads for technological devices — it seems immoral to walk, labour, or unduly exert oneself these days. Where are the conservative satisfactions of preparing a meal, working up a sweat digging in the garden, doggedly finishing shovelling the driveway? What are we being conditioned to need and feel? In addition, technological development has led persons to experience and “need” continual change. It makes

possible new experiences, different and multiple life styles — constant change, which leads many persons to expect life to be a kaleidoscope of experience and feeling. We might call it a “strobe light culture.” Most social observers, particularly those of the New Left, attribute today’s youth culture, with its new religious fervour and drug-influenced sub-cultures, to an alienation from modern society due to the loss of community we have discussed. This emerging culture, however, might be as much indebted to the direct influence of our modern technological culture on human experiential consciousness.

This emerging culture may have serious consequences, especially for tomorrow’s technologists themselves. Both technological automation and obsolescence could render technical skill and specialized expertise something less than desirable in the future. More and more, continuing engineering education is being emphasized. Soon, we are told, education will be a lifetime business, not initiation into adulthood. Careers — work — professions even — will have an entirely new meaning and relationship to individuals in modern society. Can we imagine a more radical impact on peoples’ aspirations, motivations and expectations? And in turn on our social structures?

Changing human needs and desires, of course, lead to changes in values, personal as well as social. Conservationists attack “the social engineer,” who ignores “the separate integrity of each human person as a focus of value.”<sup>13</sup> Engineers ordinarily don’t consider themselves as social engineers, but as technologists they are, and radically so. Much of the impact of technological development has been to negate “the separate integrity of each human person as a focus of value.” Technological development, for all the reasons discussed so far, has rendered our society more egalitarian than the most optimistic eighteenth century rationalist could ever have envisioned.

The atomization of the individual through dissolution of community relationships; the equalization of individuals through energy and tool



technology; the homogenization of our landscape and culture; the stress on pleasure, change, and experience, which show no individual distinctions; the equalization by technology of skill and ability; the trend towards obsolescence of skill and expertise; the paradoxical standardization by specialization, where specialization renders one specialist interchangeable with others of the same type; let alone the often remarked egalitarianism of the market place, the assembly line, the technological organization of our society — all these render the traditional concepts of individual distinctiveness and self-reliance almost irrelevant. Such are the implications for us individually of the social revolution being wrought by technology.

### The New Socio-Technological System

The societal implications of this revolution are as sweeping as the personal implications. Technological development essentially is erasing that complicated social structure where individuals, families, communities, and various types of social institutions and cultural traditions are interrelated with each other in some unclear hierarchical fashion. In its place a two-dimensional social structure is forming, with atomized individuals juxtaposed to one vast interrelated socio-economic-technological network.

In this emerging individual/technological society, paradoxes of self-reliance and freedom are emerging. Technology makes us independent of community and social restraints and traditions, but dependent on the technological system. Technology seems to greatly enlarge our freedom of choice; yet our choices usually are limited to alternatives determined by the technological system. Most choices we make are like the choice of which TV channel to watch. How does it matter whether a person lives in Detroit, Los Angeles, or New York, or in Paris, Saigon, or Mexico City? Does it matter whether you go to Miami Beach, the Riviera, or Honolulu? Few people question the fact that technological civilization soon will spread

into all corners of the globe. You will be free, but as Cicero said to the exiled Marcellus when a former civilization filled the world, "wherever you are, remember that you are equally within the power of the conqueror."

We have boundless freedom, we have leisure, we have the mobility. We do not have the luxury, perhaps, of judging whether this is good or bad. But we must admit that it is a radically different situation than has

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**Technological development . . .  
is erasing that complicated social  
structure where individuals,  
families, communities . . . are  
interrelated in some unclear  
hierarchical fashion.**

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ever existed before. The shift toward a world-wide socio-technological system has been accelerating since the Industrial Revolution as well as the Age of Enlightenment. The American and French Revolutions can be taken as signals that a vast period of radical cultural change was commencing. Engineers by the nature of their profession have committed themselves to the revolutionary movement in Western Culture — by now they have become the primary agents of social change.

### The Engineer Should be Conservative

If the engineer thinks he is conservative, but he actually is a radical — if society thinks the engineer is a conservative when he actually is a radical — some sort of "schizophrenia" is operating that inhibits the effective development and utilization of technology and planning of social change. We have serious social and environmental problems today. Engineers as well as most of society are concerned with solving these problems with effective use of technology. The solutions, however, basically are not matters of more and better technology, or of less and better technology. The solutions require an awareness of the total systemic relationships involved, and, even more basic than that awareness, a shift away from goal-oriented behaviour to process-oriented be-

haviour.

The culturally unique feature of the technological revolution in modern civilization is its goal-orientation. This orientation seems to have developed when the idea of progress emerged in the eighteenth century to give focus and direction and purpose to change — the goal of secular happiness of mankind on earth. The utopian vision of an earthly paradise became possible in the eighteenth century when the concept of the perfectability of man emerged and the Christian concept of redemption became secularized. Social change thus became goal-oriented, and after the emergence of this goal technological development became the primary means of achieving it.

Such a goal in itself is anti-theoretical to some conservative thought. And perhaps engineers — once they realize they are radicals, not conservatives — as well as all liberals can learn from the conservative. Russel Kirk says, "The conservative believes that the world is not perfectible, and we poor fallen human creatures, here below, are not made for happiness, and will not find happiness."<sup>14</sup> We need not believe man is "fallen" to accept this belief, as Camus realized when he said, "one must imagine Sisyphus happy." Camus was concerned with experience, with existence, not with progress, and his concern can alert us to a fundamental difference between conservative and radical thinking as well.

If we assume a socio-technological system, radicals and engineers are goal-oriented — change the system to change the output. Create more and more happiness, if not a virtual utopia. If we reflect over the implications of some conservative statements ("the spontaneous growth and grouping of social forms that give the individual a field for expression and activity"), we can see conservatives as process-oriented. That is, conservatives are concerned for the on-going interrelationships and effects of elements within the system on each other. It is this conservative concern which more and more must manifest itself in the future as we become aware of the "limits of growth" in "techno-



logically based human social systems" (to quote Edward Goldsmith).<sup>15</sup>

### The Socially Aware Engineer

The engineer should become aware that the output actually is an input into the system. And that in human terms, the actual goals are the processes themselves. Perhaps we all must be both radical and conservative. But we must be so in an aware, integrated manner. We must disagree with Admiral H.G. Rickover when he says, "Why should the ease and affluence made possible by technology affect precepts that have guided Western Man for centuries? This may brand me as old-fashioned, but I have not yet found occasion to discard a single principle that was accepted in the America of my youth." Admiral Rickover's perceptions do not reflect the reality of the impact of technology on society. Until his perceptions do, he will not be able to accomplish his aim, for "technology . . . to be assigned its proper place in human affairs, . . . to be

made humanistic."<sup>16</sup> And until ours do, we will not be able to control our use of technology.

To integrate technology with societal systems effectively is a matter of responsible action, which requires an awareness of all the implications. A person cannot act responsibly when his left hand doesn't know what his right hand's doing. Both hands must work together. The engineer, especially, must integrate his radical technological self with his conservative emotional self. He cannot continue to promulgate technologies requiring regional electric power grids, while also continuing the campaign initiated by Senator Goldwater against centralized bureaucratic controls.

We need new images of who we are and what type of system we're in before we can determine exactly what our problems are and how we want to solve them. A significant component of this new image should be an awareness by the engineer — and by us all — that he is the real social radical today. This awareness

is necessary before we together can use technology effectively in our societal system.

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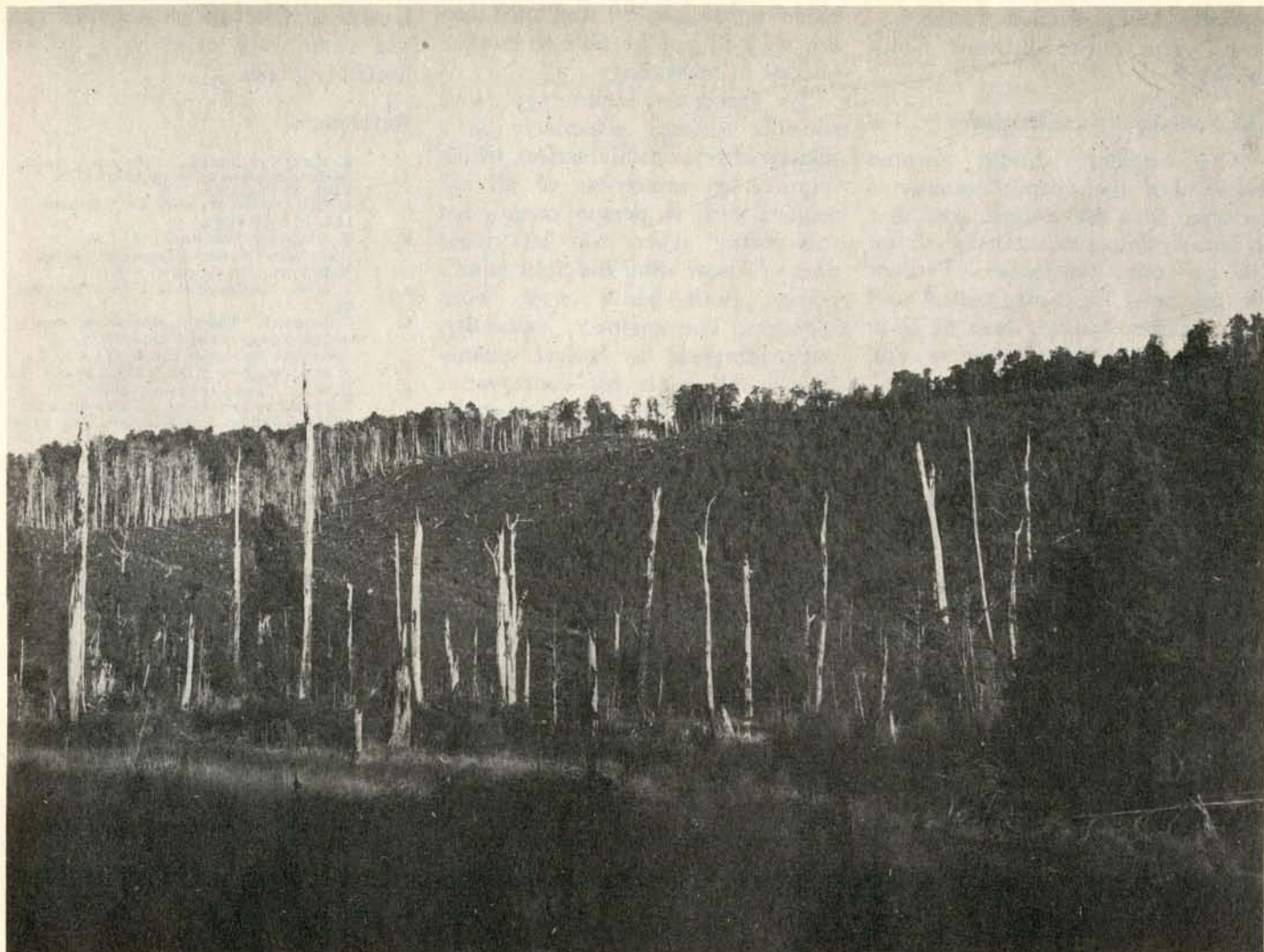
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*The burnt off remains of a beech podocarp forest in highly erodable country on the West Coast, South Island. Photo: David Harding*

# THE TRAGEDY OF NEW ZEALAND'S FORESTS

by Graham Searle

At the birth of all knowledge there was no light, no night, no day; a tight closed universe bound together in the embraces of earth and sky. The earth was mother, Papa, the sky, father, Rangi. So great was the love of these two, the one for the other, that their children, the younger gods, could but crawl and squeeze their way between them, denied of freedom and of light. For the gods to have access to the world, they had first to part their parents.

It was Tane, Father of Trees, who alone was strong enough to lift Rangi upwards to the heavens, there for him to cry tears of rain which mingle when all is dark with Papa's tears of dew. It is Tane whose trees, rooted in the land we now call New Zealand, symbolise the separation of earth and sky.

Papa, Tane adorned with plants and with birds, and to Rangi gave the Sun and Moon, a sunset-cloak of red, and a basket of stars to comfort him while his much loved Papa slept. Tangaroa, the god of fishes and reptiles, stayed — like Tane — with the earth-mother, and caused his own kind to abound in rivers, seas and forests. But Tawhiri, the god of winds, was his father's son and in the heavens stayed by his side, there to plot revenge on Tane and on the other gods who had caused Rangi to leave Papa.

The wrath of Tawhiri was turned on Tane; trees splintered and crashed; and Tangaroa's seas foamed and billowed. Only Tu, the spirit of unborn-Man remained strong and upright through all the storm. But the peace of the world was ended and the children of Man have ever since wreaked havoc among the fishes and forests of Tangaroa and Tane.



Maori teachings and folk-lore are rich in such personifications. Every element of nature has its history and its derivative genealogy, but in his importance to the evolution of life, no deic character is as vital as Tane — the spirit of fertility, the Father of Trees. Today, after 150 years of ruthless exploitation by European colonisers, the children of Tane are again under the hammer and the axe.

New Zealand has a land area of 66 million acres, similar to that of the UK, and much of that land — just as here in Britain — would originally have been clothed in trees: wonderful species so different from those of the northern hemisphere as to stagger the white explorers who first set eyes on them over two hundred years ago.

It was Captain James Cook who made the first recorded observations of New Zealand's native flora. On 9th October 1769 the *Endeavour* put in to Poverty Bay in the north of New Zealand's North Island; and, on a trip up the Waihou River, it was the trees and their boat-building potential which seized Cook's imagination.

"After landing as above mention'd", he wrote, "we had not gone a hundred yards into the woods before we found a tree that girted 19 feet eight inches, six feet from the ground, and having a quadrant with me, I found its length from the root to the first branch to be 89 feet; it was straight as an arrow and taper'd but very little in proportion to its length, so that I judged that there was 356 solid feet of timber in this tree, clear of the branches . . . Here are forests of vast extent full of the straightest and cleanest and the largest trees we have ever seen." Cook had met New Zealand's white pine — the tree the Maoris call the *kahikatea*.

But this great tree is not the greatest of Tane's offspring. In the warm north of the North Island, there still stand remnant areas of the once vast *kauri* forests: forests peppered with 170-foot giant kauris older than Christianity. Among the kauris and stretching further south than these are members of another family, the podocarps — softwoods like the *rimu*, the juvenile foliage of

which droops down to bestow on the trees a haunting, tearful appearance. There are broadleaved hardwoods too, which flower in a profusion of colours and shapes, with the *kohekohe* pointing its foot-long spikes of yellow inflorescence accusingly at the epiphytic northern *rata* which, with its deep red pin-cushion flowers, clings to and gradually grows around the *rimu* in whose branches its seeds first germinated.

Finally there are New Zealand's evergreen beech forests covering parts of the North Island's volcanically fashioned plateaux and occurring in perhaps their greatest splendour on the West Coast and in the very south of the South Island.

From each of these groups of tree species, northern hemisphere man, 12,000 miles from the old home, exacted a heavy price. Forests which had evolved in the absence of all grazing mammals and for most of their time in the total absence of man were subjected to wholesale clearance and burning. Even after the Maori arrived from East Polynesia in about 1350 AD, the forests remained largely safe. The Maoris were not pastoralists, though they did practise some cultivation, and they regarded the forests as a generous basket from which they could pluck birds for their table and wood for their dwellings and stockades. Some damage was bound to have been done, but the Maori's impingement on his forests was negligible compared with what was to follow European occupation.

By the 1820s this new white wave of colonisation was under way. Grog shops accompanied whaling depots, and mission stations followed hard on their heels. From then on things moved quickly. The whaling outfits made considerable use of native timbers, the first sawmill started up in 1838 in the northern kauri country, and — with the growth of settlements — European pastoral farming practices were established in these new lands of the southern seas. The forest was the enemy: it had to be cleared and its wood used, exported or burnt. For the forest was to be replaced by the farm.

In 1840 there were 2,000 Europ-

ean settlers mostly clustered in the north of the North Island. Relations with the Maori were mixed, although on the whole much better than might have been expected. The Maori was no pushover: he was intelligent, strong, had exceptional fighting abilities, and was blessed in these early years with numerical superiority. The Pakeha, as he called the white man, had to be respectful of him, the earlier settler. This, to a much greater extent than in other lands that they occupied, the Europeans were.

In May of 1840, after negotiations between Maori and Pakeha leaders, the British crown extended its sovereignty to New Zealand. The immediate effect was that in the next two years the number of European colonisers grew from two to eleven thousand. A dozen sawmills were in operation by 1847 and timber export was an increasingly important trade.

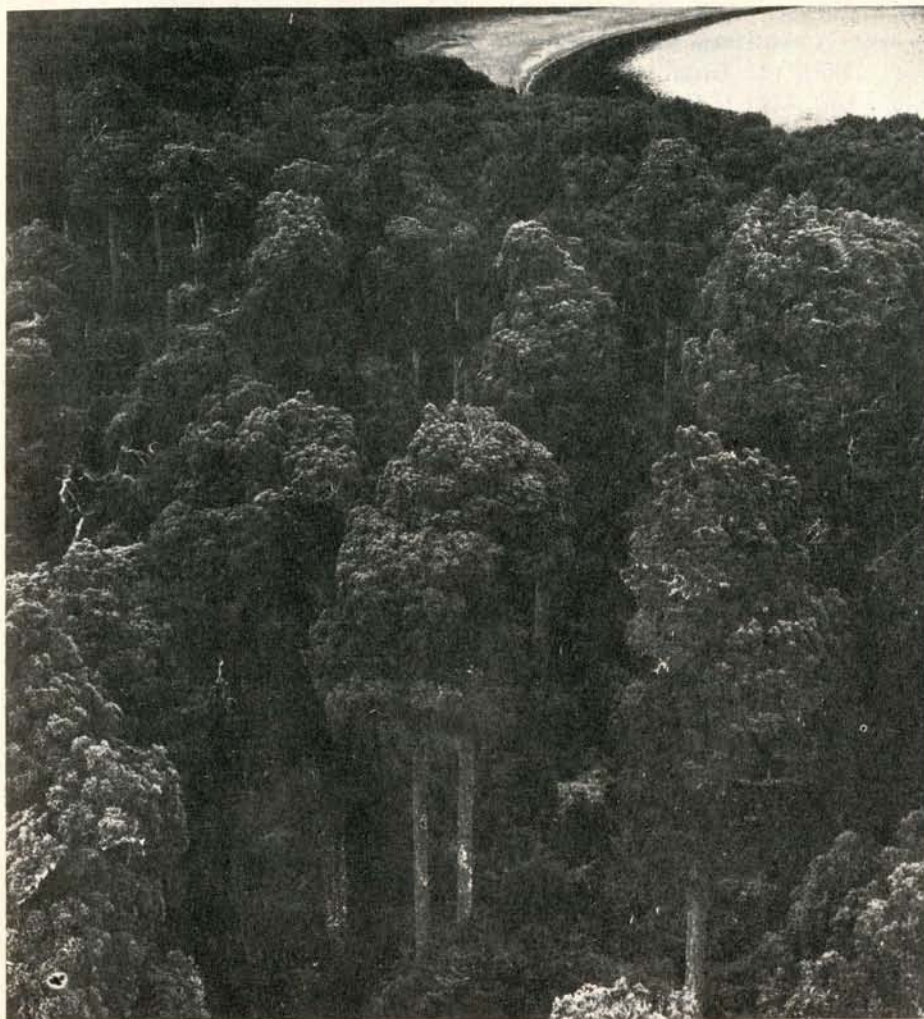
By 1861 there were 100,000 European settlers. Then, in an Otago gully in the South Island, the Pakeha struck gold — and the rush was on. In twenty years, with the aid of the planned settlement adventures which led to the establishment of the English city of Christchurch and the Scottish city of Dunedin, Pakeha numbers increased by nearly 400,000.

Trees were needed — trees for houses, trees for crushing plants, trees for flumes, trees for the new expanding capital of Wellington — and the distribution of sawmills was such that in the 1860s it was the North Island's kauris which bore the brunt of the exploitation.

By 1878, sawmills had spread throughout New Zealand, and whereas there were only a dozen thirty years before, they now numbered over 200. European agricultural practices too had spread, with vast acreages of native bush burned off each year to smooth the land for settlement and for farming.

In little over a century, in their ignorance and in their forgivable zeal, the European settlers succeeded in devastating some of the most splendid forests in the world. When they first arrived, about two thirds of New Zealand was forested. By 1968, the total acreage of native





A predominantly kahikatea forest, Fiordland National Park, New Zealand. It was trees like this which so impressed Captain Cook. Photo: New Zealand Forest Service

trees stood at 13 or 14 million acres — less than one third of the forested lands which greeted the coming of the Pakeha.

Today, the export of timber and forest products from New Zealand is big business. As the rich, native forests were cleared, new, stereotyped plantations of foreign trees were put down, usually in areas of little farming potential. The boom planting period was between 1925 and 1935, when — like Britain, upon whom New Zealand had chosen to become export-dependent — New Zealand was plunged into depression. These make-work forests of the 20s and 30s reached maturity at the end of the 1960s, and in 1969 the New Zealand Forest Services — like our Forestry Commission, then 50 years old — planned its future policy.

The 1969–1985 period was to be one of rapid growth in the forestry sector. The mass plantings

of the 20s and 30s had to be harvested quickly if they were not to suffer senescence and windthrow. But after 1985 this increased rate of growth could not be sustained unless, of course, new massive planting programmes were embarked upon right away.

The tree on which New Zealand leans ever more heavily for its “factory-forest” plantations is the Monterey pine, *Pinus radiata* — a native of California. Just as here in the UK, the Sitka spruce of North America’s west coast grows faster than it does in its native homeland, so too does the Monterey pine put on wood faster in New Zealand than in the States. Accordingly, large tracts of land have been given over to *Pinus radiata*.

Generally there is little opposition from conservation organisations and the politically important New Zealand farming community to the establishment of radiata plantations in areas which are

already denuded of trees and useless for farming. But the problem is that these areas are often less than ideal for forestry use: the prime regions are those of low-altitude, well drained hill country like that found on the West Coast of the South Island and right down south. It is here that there is currently being fought the greatest conservation battle in the whole history of New Zealand, for it is here that there is found a sizeable proportion of the country’s remaining beech woodland. To plant the pine, the New Zealand Forest Service intends to clear the bush.

In October 1971 there was published a White Paper entitled “Utilisation of South Island Beech Forests”. Broadly speaking, the Forest Service proposal was to clear-fell or intensively to log 839,000 acres of the indigenous forest — both beech and podocarp (mainly rimu) — of Nelson, Southland and the West Coast. 140,000 acres of this total were then to be managed for beech production; 51,000 acres were to be managed for podocarps; and 206,000 acres were to be “enriched” by the planting of foreign eucalypts. In all, 428,000 acres of native forest were to be replaced by plantations of *Pinus radiata*, the Californian Monterey pine.

To get some idea of the scale of such operations, we need to put these figures into a recognisable context. In the South Island of New Zealand there survive roughly eight and a half million acres of native bush. Of this, over half is administered by the Forest Service, and is largely concentrated in the Nelson, Southland and West Coast Conservancies. New Zealand’s rugged landscape is prone to erosion and water-table problems, and most of what remains of the original forest cover does so because to exploit it would be potentially disastrous to farming interests. Hence about two thirds of all native forest in these three areas is classified as “protection forest” and is conserved as such by the Forest Service. What is left in State forest control is less than a million acres of “lowland” beech and beech-podocarp associations clothing the valley sides. This is the beautiful and accessible beech forest



of the South Island. Of the one million acres of potentially commercial forest, the Forest Service proposed to leave roughly 150,000 acres as reserves, and to log the remainder: to clear an area equivalent in size to a strip of land one mile wide stretching from London to Bucharest. A small proportion of the native wood was to be used in furniture making and veneers, and the great bulk of it was to be used for pulp production.

The public outcry following the publication of the forest conversion programme was deafening. Throughout the country, conservation organisations, citizens' groups, and the public at large responded with horror and with a vehemence difficult for us in the UK to comprehend. New Zealanders really do care for what they now recognise to be a uniquely impressive natural heritage: but the trouble was that their opposition to the plans for their forests was uncoordinated and hence less effective than it might have been. However deafening their indignation, it would seem to have fallen on already deaf governmental ears.

The response of the New Zealand Government to what might have been an awkward public confrontation is probably best described as British: committee after committee was set up and the proposal so many citizens were determined to shoot down moved so quickly between committees that no-one really got a shot at it. There was a Cabinet Committee, an Officials Committee, an Officials Committee Working Committee, a National Development Council Sub-Committee, an Environmental Council Committee and finally a Lands and Agriculture Parliamentary Select Committee.

To cut a long story short, the Forest Service scheme survived its labyrinthine excursion through New Zealand's corridors of power — but not without amendment. On 8th October 1973 — two years after the publication of the White Paper — it was announced that the New Zealand Government would seek tenders from commercial organisations for the purchase of the West Coast and Southland forests. How-

ever, the forests of Nelson, one major tract of Southland bush, and a few West Coast valleys were excluded from the proposal.

These exemptions were politically astute in that they appear to be much greater concessions to public opinion than in fact they are. For instance, the Southland forest exclusion was "temporary" for a five-year period, and the forests of Nelson no longer included in the official conversion programme are currently being cleared, burnt and converted to pine plantations anyway. So, whatever changes were made, the increasingly vociferous conservation lobby has not been placated: people are still worried about the fate of the 600,000 acres of South Island forest remaining in the scheme. Importantly, the anti-clearance lobby is now well enough organised to muster a good deal of support for whichever political party might be prepared to come out strongly against the forestry pro-

posals on the run-in to the November 1975 General Election.

This next New Zealand election promises to be a close one. Neither the present Opposition — the National Party — nor the incumbent Labour Government, deprived as it is of the charismatic leadership of the late Norman Kirk, can be confident of success. Why then has neither Government nor Opposition chosen to side publicly with the opponents of forest clearance?

The reason for apparent intransigence is certainly not that this is just a minor issue which can conveniently be ignored: forest policy is likely (amazingly) to rival inflation as the major political issue of 1975. Rather, the reason for the lack of response to public pressure is that the conservation lobby is not the most powerful one chivvying the Government about trees. The Japanese and New Zealand forest industries have more clout than their

*A beech podocarp forest interior. The large trees are Red Beech, *Nothofagus fusca*. A juvenile rimu, *Dacrydium cupressinum* is seen in the right foreground. West Coast, South Island. Photo: David Harding*





opponents could ever achieve.

Japan has already butchered extensive areas of Australia's native forests, is actively wood-grabbing everywhere from the South Pacific to Alaska, and now wants New Zealand's pulpmill fodder. New Zealand forest industries want in on the act, and plan to pulp the South Island's forests themselves and sell a more finished product to Japan than just raw cellulose. This suits Japan since it will save them the energy investment involved in wood treatment and avoid the pollution problems involved in pulping operations. The resultant imports will be the perfectly reasonable amenity-demands of Japanese citizens.

Hence both Japan's and New Zealand's economically important forest industries are telling New Zealand decision makers that beautiful forests which cost nothing to grow are a luxury the country cannot afford. And the New Zealand Forest Service reiterates to a total population of only three million people in a land the size of Britain that "New Zealand's land base is not so large that it can afford to sterilise land which has a production potential and is not required for other purposes." To this mast, the Government have nailed the banner of Regional Development: replacement of native forests and pulpmill establishments are described as crucially important to the economic development of the supposedly beleaguered regions of Southland and the West Coast.

But — ignoring the absurd implication that New Zealand's luxuriant rain forests are sterile — what would happen if these massive clearance and conversion programmes were actually put into effect? Would the proposed conversion plans and subsequent fast-rotation forestry prove biologically and economically successful?

Recognising that there remains a lot of feasibility research to be completed (which will anyway not be completed at all if the Government decides to go ahead when it receives the commercial tenders), the answer I should have to give now is "No". Interestingly that is the same answer one gets from the great majority of New Zealand scientists

who have concerned themselves with the beech scheme.

Dealing first with Southland, the areas planned for conversion are themselves not large enough to support a pulpmill. Indeed, when the lobbying for Southland pine conversion was first initiated there was no intention to pulp the cellulose — only to export it in a chipped form to Japanese pulpmills. But, after the Australian experience of chip-export schemes in which the Commonwealth discovered that such forestry enterprises inspired by Japan's Ministry of International Trade and Industry made a profit for Japan and a fool out of Australia, it is recognised that to plan for the chip market is singularly unattractive.

So New Zealand wants to boost the Southland economy by pulping a large proportion of the forests and the plantations with which they will be replaced. Combined with the wood yield of plantations already established further east, there would be enough cellulose to support an economic pulpmill in the Southland province. The trouble is, however, that to pulp you don't just need wood, you also need water.

Until a few years ago, Southland was blessed with what, in terms of volume, was New Zealand's greatest river — the Waiau. Then New Zealand, under pressure from American and British industrial interests, diverted the Waiau to feed turbines giving cut-price electricity to a foreign-controlled aluminium smelter. Now there's not enough water left in the Waiau — or in any other Southland river — to quench the thirst of a pulpmill. Somewhere along the line, the economic planners failed to realise that you can have your cake, you can eat it, but you cannot eat it twice.

Consequently Southland's native trees would anyway have to be transported across the bottom of the South Island to the province of Otago to be pulped, which itself defeats the regional economic arguments for this Southland forestry programme. Also, within a couple of decades — given planned tree planting on unforested lands — there will be available enough cellulose in the south east of New Zealand to

feed a pulpmill without resorting to the removal of Southland's rich native forests. Finally, although enough native hardwood trees will be managed and retained to support the indigenous sawlog-based industries, replacement of vast areas of hardwoods with softwoods could severely circumscribe the expansion of "specialised-use" industries in the area. Furniture makers nationally just can't get enough high-grade wood to meet their demands. A wholesale switch in emphasis to pulpwood production might — for many reasons — be commercially undesirable.

Moving to the West Coast, the arguments advanced in favour of forest replacement are similar to those for Southland. Regional development is the watchword. But watchers of the West Coast, in plumping for a pulpmill, have clearly been viewing from afar, and have failed to understand the social implications of such capital-intensive, centralised developments.

In the whole West Coast region, which totals some 9,000 square miles, there are only 33,000 inhabitants, largely grouped together into three main townships. The people themselves, cut off as they are from the rest of New Zealand by the towering Southern Alps, are aggressively proud of the West Coast. They identify with their small towns, their farms, their small local industries, and they are resentful of "outside" control of their activities. They have retained a sense of scale which has been lost from the large conurbations of Wellington and Auckland; and it is this perspective which is responsible for their growing antipathy towards large-scale pulpmill developments.

The New Zealand Government and the forest industries, in proposing extensive factory forests in place of West Coast bush, have made great play of the 1,500 new jobs which would be created in this development region. What they have failed to note is that in the region concerned there are less than 50 people unemployed. To fill the jobs, workers would have to be brought in from outside (although nationally — unlike in Britain — there is no unemployment problem, and



indeed in certain industries there is a great shortage of labour). Such immigration would threaten the whole social fabric of the Coast. Hence Coasters themselves favour smaller-scale forestry enterprises, the establishment of some plantations (particularly on deforested land), greater sustained yield management of native trees, local sawmills, and local specialised-use wood industries.

But the dangers of the West Coast pulpmill scheme are not only social; they are also physical. The coast is a high rainfall tract of heavily dissected country — a land of tree-clad, steeply graded hillsides. To get the wood volume required by a commercially profitable pulpmill, the Forest Service has zoned very large areas of highly erodable country for forest clearance. They have ignored their own safety limit of a 26-degree slope maximum and have ignored the recommendations of a New Zealand Land Use Capability Survey, the findings of which urge forest retention in these vulnerable areas. Even the empirical lessons

of what happens when trees are removed from steep West Coast hillsides (soil losses have already proved problematical enough for further clearance to be abandoned in two localities) have failed to deter the planners. But what looks good on the map looks different on the ground, and if the clearance scheme goes ahead, large areas of currently fertile land will — to use the Forest Service term — be “sterilised”: the soils of their hillsides will be washed into their valleys.

Since, by the time this happens, large amounts of capital will already have been invested in pulpmill construction, the forest-grabbers will have to move further afield to secure the wood volumes they need to keep the mill fed. Areas which currently fall outside the scheme will be drawn in, and good quality wood originally earmarked for special uses is likely to be channelled into the pulpmill's hoppers.

Old-fashioned erosion, which New Zealanders of all people should

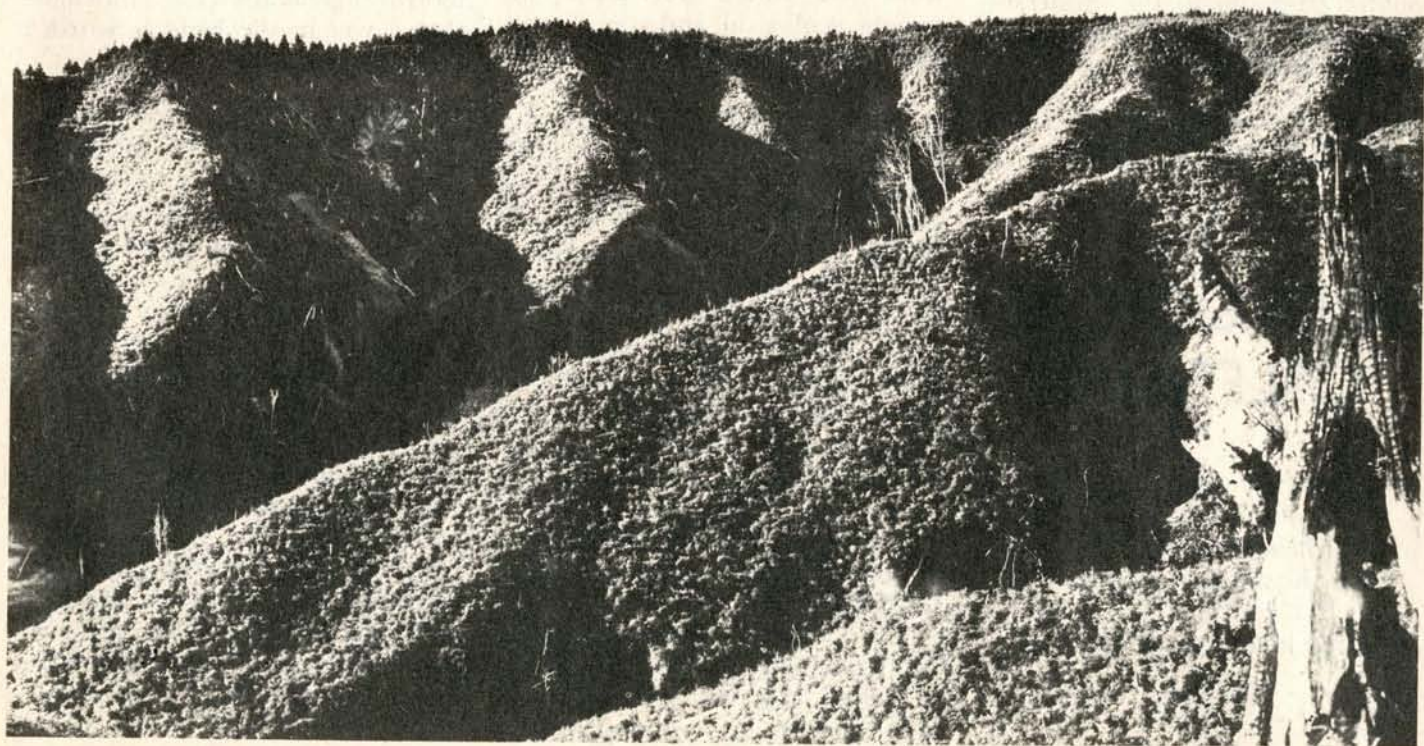
know something about, is bad enough. But that is not the only problem, for when the ecologically complex native forests are replaced by fast-rotation tree crops, nutrient deficiencies will cause headaches.

Currently, the West Coast and Southland beech forests recycle their own nutrients. The elements crucial to their survival are passed from plant to plant and from generation to generation in the process of decay and renewal. Some nutrients are leached out and some returned in rain, but the forest itself is an efficient self-sustaining nutrient-retention system. With wholesale forest removal, this system will be destroyed; and the burning of the slash remaining on the ground, designed as it is to facilitate pine establishment, will only accelerate nutrient loss by volatilisation and surface run-off.

Nutrients which don't go up in smoke will remain to enable the first crop of pines to get off to a reasonable start, but later in the trees' lives nutrient deficiencies will

*Heavily dissected high-rainfall country denuded of forest. West Coast, South Island.*

*Photo: David Harding*





slow growth rates. Worse still, when the first crop has been removed, even more problematical nutrient deficiencies will appear in the second generation, and this phenomenon has already been observed in older New Zealand plantations.

To counter such threats to productivity, fertilisers will have to be spread over great tracts of plantation country, adding appreciably to forest maintenance costs (which have yet to be quantified by the New Zealand Government). But in high-rainfall areas like the West Coast, leaching rates will be very high indeed, and much of the fertiliser which started off on the land will end up in the rivers and the lakes. Siltation and nutrient enrichment of waterways will damage fishing interests and their associated tourist potential, and within one human generation will choke to death at least three of the most beautiful lakes on the West Coast.

Water-related problems in the forests themselves are likely to be almost as great as those caused by pulpmill establishments. Pulpmills are not good neighbours, and, in New Zealand, are not even popular among the people for whom they provide a living. Workers at the Kawerau plant in the North Island have staged a series of strikes and stoppages (and have devoted their own time and money) to drawing public attention to the intolerable atmospheric and water pollution conditions in the vicinity of the

mill. Such pulping facilities are easy to track down: if you're down-wind, you smell rotting eggs; if you're downstream, you see discoloured, polluted rivers — which is part of the reason why Japan would prefer to have New Zealanders pulp their own forests.

Finally, there is the effect of the scheme on wildlife. New Zealand has a heritages of native birds which has to be seen to be believed. Berry-eaters and honey-eaters abound in the low-altitude beech-podocarp woodlands and replacement of these forests will — except in the proportionally small reserved areas and in narrow gullies where the tractors can't get — destroy the birds' food source. Many of New Zealand's birds are flightless, since in the course of their evolution there was an absence of predators and no great need to take to the wing. Fire will account for many thousands of these native birds, each of them theoretically protected by New Zealand's "progressive" conservation laws. Loss of nest sites and food will account for many more, and the treatment of the forests with pesticides, herbicides and insecticides will add to the toll of native creatures.

But let us suppose, just for a moment, that the beech forest schemes proposed for Southlands and the West Coast could actually work and would not cause any serious ecological and social problems. Would New Zealand's decision

makers then be justified in swapping half a million acres or so of the country's unique native forests for Foreign Exchange? That is actually what is happening. Is it a good swap to trade the forests for Japanese Toyotas and British Minis — to trade New Zealand's native birds for, say, Kentucky fried chickens?

My answer is again "No". Many of the most splendid, naturally regenerating forests of the world stand little chance of surviving the century: their future — such that they have — is already mapped out for them. Colossal tracts of tropical forest in the Philippines and in Indonesia have by now been converted into woodchip and pulp. Elsewhere, the forests of India and Sri Lanka, Africa and South America are — like the children of Tane — under the hammer and the axe; and in the Pacific region, New Guinea, Malaysia and Australia are next in the queue.

New Zealand, so blessed as she has been with her own characteristic flora and fauna, might — even yet — decide to opt out of this rush to destruction. There are other, better ways of enhancing regional well-being. But if New Zealand decides to step up the rate at which she divests herself of her forest heritage, then her decisions of today will survive as a supreme indictment of her contemporary values. Tomorrow's generation might not agree that a yen in the hand is worth a beech in the bush.



## An ECOLOGICAL CALENDAR

"There are thirteen months  
in all the year,  
As I hear many men say.  
But the merriest month in  
all the year  
Is the merry month of May."



So it was in the ancient Celtic calendar which survived in parts of Britain with the Old Religion until the Middle Ages, as this verse from *The ballad of Robin Hood and the Three Squires* testifies. It had far more simplicity and sense than our present-day calendar, having 13 equal months of 28 days each, leaving one extra (holy) day for the celebration of the death of the old year and the birth of the new year at the Winter solstice (22nd December).

The modern calendar has a quite haphazard arrangement of 30 or 31 days (28 in February) and, aptly symbolising our loss of contact

with nature, does not begin where it ought to, on the day after the shortest day, but quite arbitrarily a week later.

Another way in which our modern calendar is both inaccurate and unrelated to nature is in the naming of the months. In the Celtic calendar each month is named after a tree appropriate to the season. But what do we have today? An assortment of Roman or other pagan gods, which have lost what little relevance they ever had, and mere Roman numerals (the wrong ones): September, October, November, December; meaning the seventh, eighth, ninth and tenth months,



instead of 9th, 10th, 11th and 12th. This inaccuracy started when Julius and Augustus Caesar decided vain-gloriously to name months after themselves and so pushed the others out of place.

There is a little poetry in March, April, May and June, and perhaps even January and February, which have a rather unwieldy foreign sound about them, but the rest have only the justification of familiarity.

The first thing to be done in overhauling our decrepit calendar is to make our months into true "moonths", i.e. a measure of the period from one full moon until the next. Even the simple Celtic calendar was amiss in this respect. It was the early Athenians who first adapted their calendar to the period of a lunation: 29½ days. Obviously one cannot have 29½ days in a month, so they did the next best thing, which is to have alternate

months of 29 and 30 days. This leaves 11 days left over which they made into an extra short month.

I believe that the reformed calendar should reflect the natural year as closely as possible, and incorporate festivals and "holy days" at the appropriate seasons. Now, while the Athenian calendar had accurate "moonths", it did integrate these with the four important times of the year which depend on the sun: the equinoxes in Spring and Autumn, and the Winter and Summer solstices, which fell at arbitrary points in the relevant months.

Another aspect is that, while some people might welcome an eleven-day orgy at the end of each year, it seems better to me to spread the extra days throughout the year. With a little juggling it is possible to keep the basic structure of alternate months of 29 and 30 days, but insert some extra days,

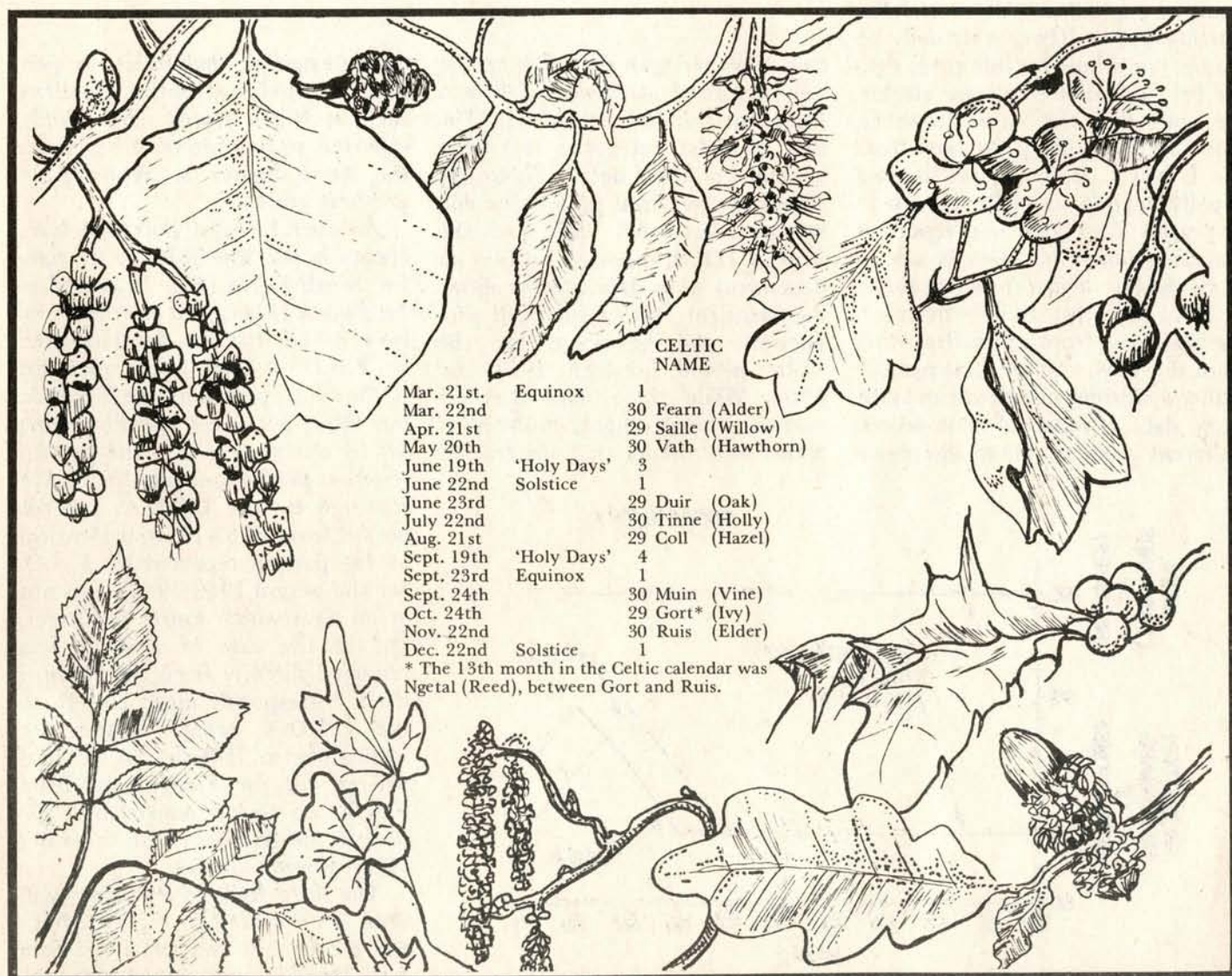
coincident with the equinoxes and the solstices between the regular months. It can be seen from the table below that this arrangement results conveniently and by chance (?) in having two long holidays in the warm part of the year. It also means that the phases of the moon occur at the same time in each of the three months in any quarter of the year. The extra day in leap year would, I feel, be better placed at the end of the year in mid-Winter, as another special "holy day", rather than its present insignificant position at the end of February.

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Richard Carder





# The Inaccuracy of World Crop Data

by

C. Richard Tracy

The University of Wisconsin Climate/Food Project has had the expressed goals of understanding the global food production system well enough to predict the world's food productivity up to 24 months in advance<sup>1</sup>. This research entails modeling of climate-crop interactions which depend on data detailing the historic record for crop production and land area harvested for each country modelled. In attempts to model United States' crop production<sup>1</sup>, we have sought data from the state offices of the U.S. Department of Agriculture, Statistical Reporting Service. There is virtually no way to know how reliable these data are because there is but one authority collecting the data. However, since all of the data obtained from the U.S.D.A. are estimates that are usually revised annually for up to five years after their first report, it can be assumed that there is at least some degree of inaccuracy in them.

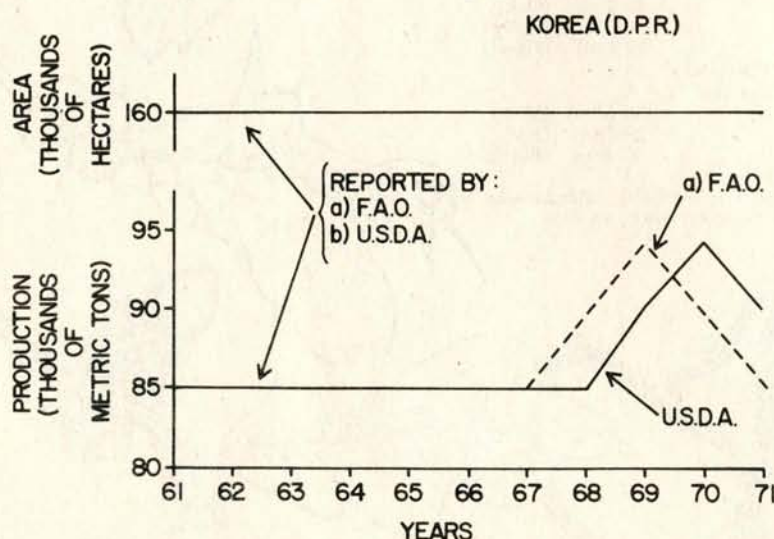
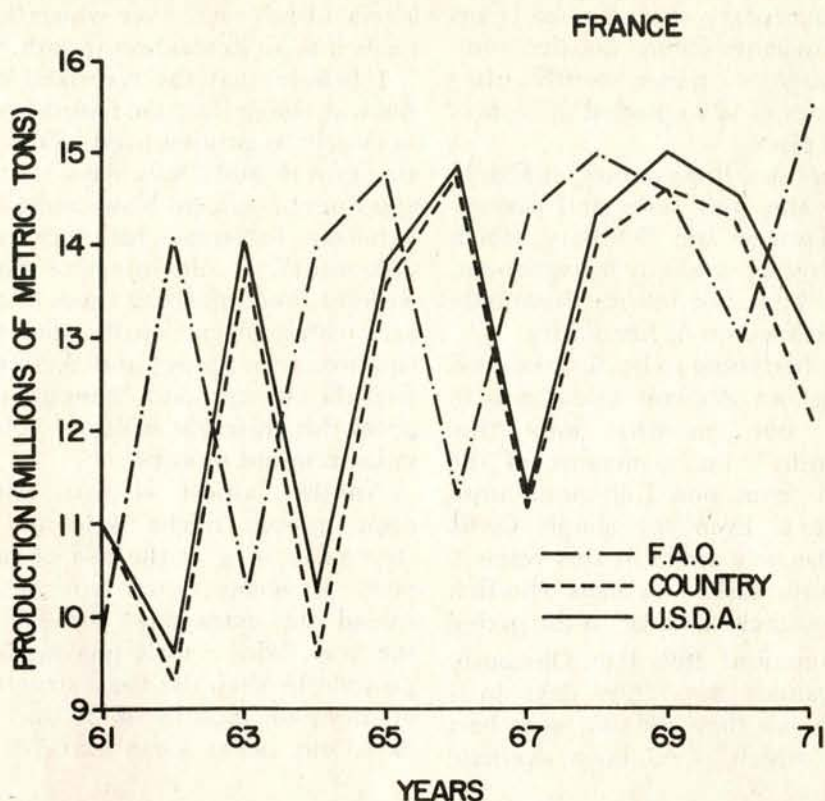
More recently, we have been collecting data from countries other than the U.S., and we have noticed rather disturbing discrepancies in the same data as reported from several different sources. These discrepan-

cies, together with data that can be only regarded as suspect, fall into three identifiable categories. The first of these categories was what we call "political data." Figure (1) illustrates the wheat production and hectareage-harvested data for the Korean D.P.R. reported by two independent crop data sources showing identical figures for both production and hectareage for the entire period between 1961 and 1967. While these data may be correct, it seems highly unlikely. It seems more likely that for reasons

of bureaucratic inabilities or perhaps some political motive, countries such as North Korea have simply reported to any interested agencies the same figures as reported in previous years.

Another form of potential inaccuracy is also illustrated in the data for North Korea (Fig. 1) as well as for France (Fig. 2). In each case, we have noted that the data reported by F.A.O. is often nearly identical to the data reported by the U.S.D.A. but differ from each other by being off by one year (e.g. — the pattern of wheat production data for France reported by the U.S.D.A. for the period from 1963-1970, is identical to the pattern reported by F.A.O. for the period 1962-1969). It is not at all clear which source is correct, but in the case of France, data reported directly from the country itself corresponds more closely to the U.S.D.A. report though not identically so. This is not a trivial matter, for the French data from F.A.O. are almost consistently 25-35% in disagreement with the other two reporting sources.

The third form of discrepancy in data is illustrated in Fig. (3). Both the production and hectareage data for Mexico are everywhere dis-





similar between data sources, and there appear to be no obvious patterns that suggest why this is the case. These data are often better than 25% dissimilar, and crop yields computed from the quotient of production and hectareage data are occasionally discrepant by more than 30%.

A peculiar example of this third form of discrepancy is illustrated in Fig. (4) which shows that the production data reported by two different agencies of the same country (Taiwan) are occasionally discrepant by as much as 30%.

It is often the case that it is impossible to decipher which, if any, data source is correct. Therefore, one must assume that it may not be possible to obtain crop production statistics for some countries with accuracies better than 30%. If data with this degree of inaccuracy are used in models such as those reported by Buttel *et al.*<sup>1</sup>, which have mean errors of *ca.* 11% and occasional errors of better than 20%, one should expect predictive inaccuracies that occasionally exceed 40%.

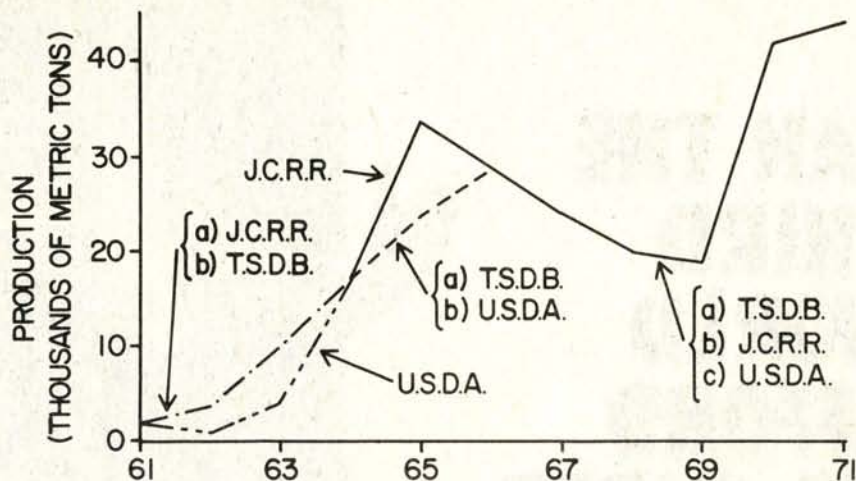
It must be concluded, therefore,

that the poor reliability of worldwide agricultural data, make the feasibility of very accurate crop prediction models very tenuous.

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#### TAIWAN



#### Figure Legends

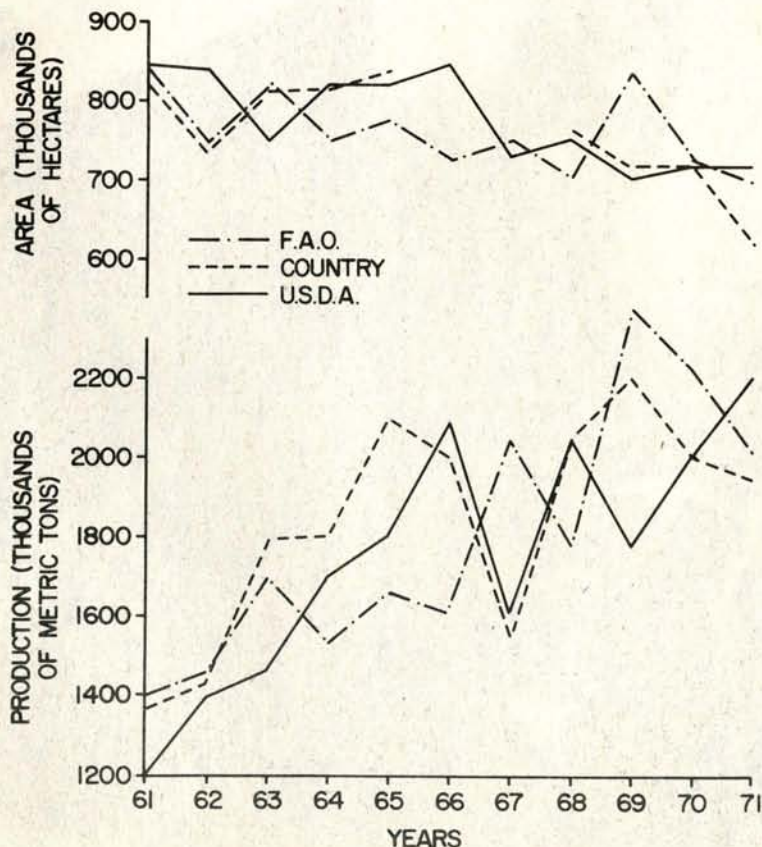
Fig. 1 Production and hectareage of wheat harvested in North Korea as a function of the year reported by F.A.O.<sup>2</sup> and U.S.D.A.<sup>3</sup>.

Fig. 2 Wheat production in France as a function of the year reported by F.A.O.<sup>2</sup>, U.S. D.A.<sup>3</sup>, and the country itself (Personal communication from M. Jacques Legret, Association Generale des Producteurs de Ble et Autres Cereales, 8, Avenue du President Wilson, 75116 Paris, France).

Fig. 3 Production and hectareage of wheat harvested in Mexico as a function of the year reported by F.A.O.<sup>2</sup>, U.S. D.A.<sup>3</sup>, and the country itself (Personal communication from Richard A. Smith, Agricultural Officer, Paseo de la Reforma 305, Colonia Cuantenio, Mexico D.F., Mexico).

Fig. 4 Wheat production in Taiwan as a function of the year reported by F.A.O.<sup>2</sup>, U.S. D.A.<sup>3</sup>, and the country itself (Personal communications from Chinese Information Service, 159 Lexington Avenue, New York, NY 10016, and from Joint Commission on Rural Reconstruction 37 Nau Hai Road, Taipei 107, Republic of China).

#### MEXICO



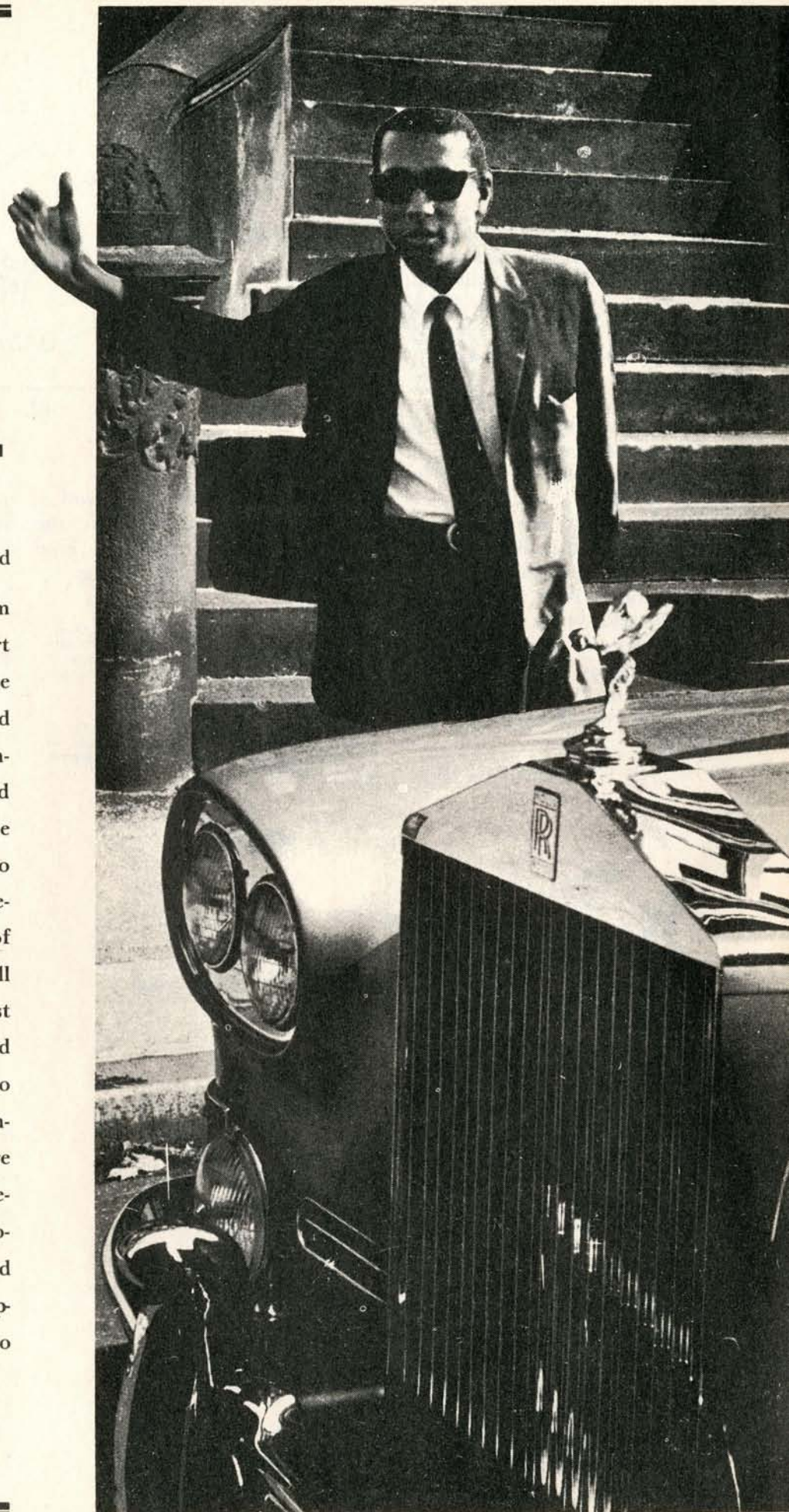


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# CAN THE THIRD WORLD AFFORD ITS SUPER- ELITES?

Allan Rodger and Goran Backstrand

The era of Western Colonialism may be over, but we still exert tremendous influence over the countries of the Third World through their westernised, high-living super-elites, whose aims and values have moved away from those that their native countries need to cultivate. It is ironic, even sometimes tragic that the full impact of Western high technology living will be felt in developing countries just at the time that the industrialised world is discussing alternatives to their present patterns of consumption and life style. Are there ways of communicating this reassessment of social and technological goals? This message could be more important than any development assistance contemplated so far.





## Leadership and Elites

The direction taken by a country depends largely on the decisions taken by the acknowledged leadership. It is this group which sets the pattern and establishes the way in which it and the rest of the country react to the pressures of the outside world. It is to them that the task falls of formulating the goals and aspirations to which the country at large can aspire. It is quite possible, indeed likely, that the goals formulated by this elite will be inappropriate for the betterment of the whole country. We would do well, therefore, to consider carefully how the process of goal formulation takes place and who is most effective in influencing the final decision. Firstly it should be noted that the elite probably do not intend to set the pattern of life, social aspirations and cultural goals for their country. Their role is not one they consciously selected or took upon themselves, it is one put upon them by the rest of the people. Not surprisingly the goals developed by these people are goals to which they themselves aspire. They are not goals conceived in terms of the mass culture, indeed the elite might well hold the opinion that these goals were wholly inappropriate for the masses. But despite this, these goals are adopted in one form or another and in varying degrees. Thus goals first established by a very special group for their own personal use become applied by, and give direction to, the mass culture of the nation.

It may help to ask 'Who are they that comprise the elite and where do they look for their social goals?' If we assume that the elite are also those with high incomes then we find that in developing countries they are a very small proportion of the total population. The income distribution in these countries is very uneven when compared to the distribution within the developed countries. Thus the leadership (associated with power and income), is proportionately much smaller in the poor countries than in the rich.

Closely associated with the elite is the urban population. In propor-

tion to the total, the urban population is usually low in poor countries and higher in rich ones. The World Bank Working Paper on Urbanisation June '72 p.8, states ". . . a strong correlation exists between degree of urbanisation and level of income per capita." (See Table 1 and Chart 1). And later in the same publication: "Average Gross Domestic Product (GPD) in the major urban centres of the developing countries may be three to five times that of rural areas, with a somewhat lower differential for the smaller towns. Even allowing for higher prices in the towns, the gap is wide, and on somewhat scant evidence appears to be widening. A similar situation has developed within the urban centres with a small and increasingly wealthy group separated socially and often physically

from the poorer mass of the population".

From this we can identify three clearly defined and interrelated social groups. In the country as a whole there are the towns — usually dominated by the capital. They represent a small proportion of the total population but, having relatively high incomes, the town dwellers are, at their own level, an elite within the country. Within the towns themselves there is the small rich elite.

The goals of the elite become embodied in their life style. This in turn becomes a model to be emulated by the urban dwellers and in turn the life style of the urban dweller becomes the model for the rural dweller. At each stage there is necessarily a failure to achieve the goal but even so this hierarchial

## NATIONAL WHALE SYMPOSIUM

The great whales and their smaller relatives will be the subject of a national public conference at Indiana University in Bloomington, Indiana on November 9 through November 12, 1975. The National Whale Symposium will gather together experts from the social and natural sciences, arts, and humanities, and concerned citizens to consider the plight of whales and dolphins. Through such fields as international law, biology, literature, folklore, and music, the Symposium will explore the past and present relationships that man has had with the whales, and formulate what mutually beneficial relationships might be pursued in the future. The National Audubon Society is joining Indiana University and other national organizations in sponsorship. For information write: The National Whale Symposium, 605 South Fess Street, No. 3, Bloomington, Indiana 47401. U.S.A. Phone 812 339-1484.





sustem of goals, with many fine gradations, gives direction to the social, cultural and industrial development of the whole nation. This concentration of leadership and goal formulation within a very small group creates a situation quite different from that to which we are accustomed in the more broadly based societies of the developed countries. For an idea to infiltrate the goal concepts of a developing country it must gain favour and be adopted by the elite. This, as we have seen, is a small number of people compared with the number which would have to be similarly influenced in a developed country: *Because of this the situation in the poor country is much more critical, much more sensitive to outside pressure, more subject to manipulation and much less responsive to the internally generated needs and aspirations of the great mass of the population.*

### Goal Formulation of Elites

The elite of a poor country is greatly influenced by the developed countries in three principal ways. In many cases there has been a history of colonial rule by a European power. Under this regime a great part of the leadership was supplied from outside the country. They brought to the colony their own goals and aspirations and those of the colonial power. These were then adopted, at least in some measure, by the indiginous population. Over several generations a colony learned to look to Europe for direction. Arising out of this relationship most underdeveloped countries have strong commercial ties with the developed countries. They supply the raw materials for high technology and industry. Thus their international activities and the social interaction which goes with this — such as the employment of foreign experts in business and industry — are all with the developed countries and not with other underdeveloped countries. This has had the effect of dividing up the underdeveloped world and setting the various countries as rivals for the custom of the rich countries. This is clearly seen in the pattern of trade where

the volume of trade between the poor countries and the rich is very large, yet trade between poor countries is almost non-existent. This pattern of trade has created communications patterns which in turn reinforce the existing patterns. A telephone call from Khartoum to Lagos will be routed through London. The airlines naturally follow the same routes. And thirdly, in science and technology education, and particularly the education of the rich elite, turns the attention of a poor nation in the direction of the rich nations. Partly this is a matter of language because in many poor countries the only available lingua franca is that of the ex-colonial power. (The last two decades have shown a further concentration on the English speaking world due to the increasing use of English as the international language of technology. It has recently been estimated that over 75% of all technical material is now published in English). Within the realm of education comes the influence which arises from sending the sons and daughters of the elite to school in the rich countries. Inevitably they absorb the life style and goals of these countries. Although this practice may be less common now than it was in the last days of the colonial era a new practice has arisen of sending post-graduate students to the developed countries for further study. In this way the educational system, led by the universities, is indoctrinated in the ways of high technology. The civil service and government are almost inevitably drawn from people who have been exposed to high technology living and who aspire to a way of life which they learned in those most formative years of their education.

In parenthesis it should be noted that it matters not at all whether this influence comes from education in the East or West. Both are committed to a way of life based on high technology and high levels of energy and material consumption. Their differences lie mainly in how they propose to achieve this and how they distribute the fruits of their labour, and not so much to their goals.

### The Role of Foreign Expatriates

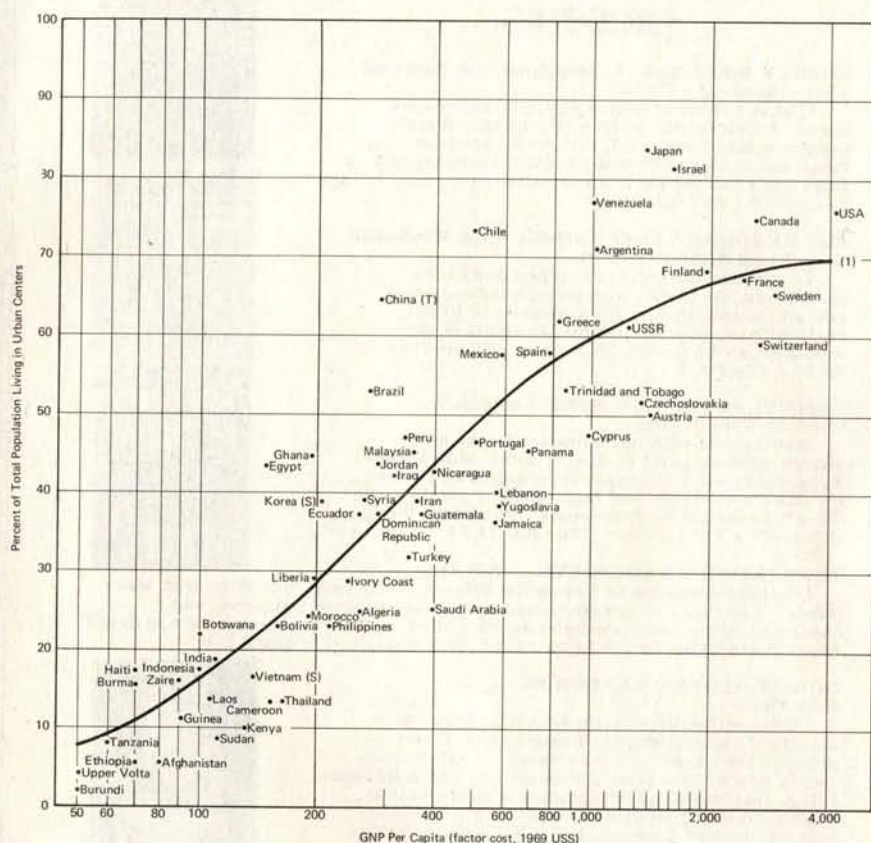
In addition to the indiginous leadership there is always a foreign expatriate group who, by their position and level of wealth, have a strong influence on the local leadership and on the country as a whole. Three groups may be identified, the employees of the multi-national companies, the diplomatic corps — including the officers of the international agencies and the expatriate 'non diplomatic' staff, and the large body of expatriates who are supported by bilateral or multi-lateral aid programmes. All of these are supported by their parent organisations, be they private company, national government or international agency at very high standards of living based on very high incomes, high levels of 'perks', and, in the case of the diplomatic corps, special privileges. All of this is supported at a level which the individuals themselves would not be able to afford if they were in their own countries, even if they were earning high salaries. For various reasons of their own the sponsoring organisations support this very high level of high technology living.

*The effect of this subsidisation of the living standards of a small group within the underdeveloped countries is to create a super-elite of expatriates. Because the elite group of the indiginous population is itself very small the influence of the expatriate super-elite group is correspondingly large. The poorer the country and the smaller its own elite, the more it will be dominated by the social patterns, aspirations and life style of the expatriate community. These are the very things which give a country its own internal direction and motivation, yet they are being supplied to poor countries by the rich countries. This might not be a matter for too much concern if the people of the poor countries had some hope of achieving the goals paraded in front of them by the rich, but far from this being the case the rich countries themselves could not even attempt to support their whole populations at the levels of material influence at which they support their agents abroad. Increasingly it is being doubted that they ever could. In*



## BACKGROUND DATA ON URBANIZATION

### Degree of Urbanization Compared with GNP Per Capita



#### Sources:

1. GNP per capita—World Bank Atlas, 1971.
2. Urban Area Population—Kingsley Davis. World Urbanization 1950-1970, Vol. 1, University of California, Berkeley, 1969. Definition of "urban" is based on differing national standards.
3. Percent of population in communities of more than 100,000 for Table 1 in main text are from UN Demographic Yearbook: 1970, New York, 1971, Table 9.
4. Figures based on most recent census or estimated from sample surveys ranging from 1960 to 1970.

(1) Curve fitted to type  $y = \frac{a}{1 + be^{-c(\log \text{GNP})}}$

**Table 1: Urban Population in Developing Member Nations of the World Bank**  
by GNP Per Capita (1970)

GNP Per Capita	Under \$100	\$100 to \$199	\$200 to \$349	\$350 to \$574	\$575 to \$1,000	Over \$1,000
Percent of Total Population in Urban Areas	9.5	17.7	39.5	45.3	53.6	69.0
Percent of Population in Communities of More Than 100,000	4.6	10.1	19.2	22.2	27.2	31.7

these circumstances it must be recognised that the leadership and direction which is so unthinkingly given to the poor countries by the expatriate communities is, perhaps, and indeed probably, wholly inappropriate for the well-being of the people. That many of the expatriates are there for the purpose of giving aid to the host nation, either directly or indirectly, does not absolve them from responsibility; it merely adds poignancy to the situation and illustrates how poorly understood is the concept of development.

### Reaction — and Action?

The role foreign expatriates play has been recognised in the past. The problems involved when "experts" confront, and are confronted with everyday life in a rural developing country have been acknowledged throughout the history of international development aid. The Peace Corps and organisations sending out volunteers are attempts to avoid the further increase of the super-elite. But these efforts have been largely in vain. The problems just explained have intensified during the past decade. A discussion about the role of the super-elites ought to start again on the basis of a new ecological consciousness.

*Firstly* — The problem should be looked upon as truly international. As such it can be tackled only at the level of the international community. It is ridiculous that members of this community should support an international "jet-set" to tour the world and preach the gospel of international co-operative effort and interdependence while ignoring the role of the super-elites themselves in the formulation of life styles and social goals. They should realise that this is so and should take action to prevent it.

*Secondly* — All over the world it is nowadays acknowledged that the Gross National Product (GNP) has serious shortcomings as the sole indicator of human well-being. Consequently international goodwill and support must be expressed in many more ways than merely by the transfer of capital resources. One way for a member of today's super-elite, living in a rural develop-



ing country, to contribute to the well-being of the host country would be to favour — consciously and continuously — local products, for example:— local fabrics instead of imported ones, local foods instead of imported cans, labour intensive local products instead of capital intensive imports. Such an attitude could very well make a useful contribution to the debate on the impact of technology, employment opportunities and other environmental problems.

*Thirdly* — Recent changes in the production, distribution and consumption of energy have undoubtedly had very serious repercussions in all countries and particularly in the poor ones. It is probable that low cost energy will not be generally available in the near future. The implications for development in poor countries are evident. Are there any possibilities to influence the super-elites towards adopting less energy consuming life styles? Again, how should international co-operation be defined? Could the super-elite find a better way of accepting a life style more in tune with societal goals relevant to the host countries? Would it not be wise to foster competition within the super-elite groups, with all their intellectual support resources in order to find ways of reducing per capita consumption of energy and materials? Some incentives must be found in order to halt an evolution that makes the super-elites more numerous and more super and more detached from the countries in which they live while world resources of food and energy are dwindling away, and suffering in the poor countries increases. The consumption of the super-elites is, of course, marginal in relation to the total. But development problems are not only a question of material resources. They also have an immediate and very important psychological dimension. We must recognise as absurd the situation in which the super-elites go to poor countries to live in greater opulence than they could ever dream of doing in their home countries. This anomaly demands action now.



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### ENERGY BOOK







## Report

### Anthropology and Nutrition

I suppose only nutritionists are surprised that people do not usually choose their food for nutritional purposes. Research by Professor Mary Douglas and Michael Nicod, into the eating habits and customs of four working class families in different parts of England<sup>1</sup> formed the basis of Mr. Douglas' address at the Anthropological Institute's conference 'Taste and Taboo', which brought together anthropologists and nutritionists at Cumberland Lodge, Great Windsor Park recently.

Meals are as subject to rules as grammar is, and just as spoken language carries, besides its overt meaning, messages about the social relationship between the speaker and the listener, so food can be a powerful medium of social symbolism. Consider the way in which social distance is indexed by the sorts of food we offer to different people: there are some people we never eat with, though we may sit next to them in a public eating place. Among those we invite for meals there are those for whom we prepare a specially elaborate and formal meal, and those with whom we share our ordinary fare.

Our food preferences and our food taboos may express the fundamental categories we impose upon the world. Dr. Douglas re-analysed the dietary rules of Leviticus to demonstrate their logic as a system of classifying animals in relation to man, and the tribes of men in relation to God.<sup>2</sup> She showed that the abominable pig is abominable not, as some nutritionists have supposed, because eating pork in a hot climate is a health risk, nor because

of its dirty scavenging habits, but simmers on the back burner and because the pig does not fit into the animal classification system of the Old Testament Jews. Given a classification which takes as its prototype of 'proper ungulate' and 'clean food' the cloven hoofed, cud-chewing stock of the Israelites, the pig fails. It is cloven hoofed, but is not a ruminant, and does not fit the category of 'ungulate', therefore in the scheme of things it is outside the category of edible beasts.

Food taboos and preferences may set people apart from their neighbours and thus may become powerful symbols of ethnic or social identity. This theme was taken up by Professor William Shack in a paper on Afro-American 'soul food'. Soul food is a meal system which emerged out of the conditions of black slavery and white poverty in the deep South. Its main items — pig's offal, tail, neck and trotters, turnip tops and other greens and legumes are those which were discarded by the plantation owners, and which could not be marketed by tenant farmers. These foods stewed together in a pot, and eaten with corn grits were, and in some places still are, staple foods in the South; a diet which mirrors the southern power structure.

In the black ghettos of the North, however, soul food has become an important and prestigious symbol of ethnic identity and eating soul food together an expression of community and sect membership. It is perhaps not surprising that Elijah Mohammed's Black Muslims set themselves apart as a 'chosen people' by adhering to dietary rules that explicitly forbid the eating of soul food items.<sup>3</sup>

Dr. Dorothy Shack spoke of the way in which white administrators and educationalists mistake deviations from their own eating norms as evidence of the nutritional and emotional deprivation of negro children. Afro-American family life is organised around the long working hours and shift working of the adults and the school hours of the children, which make it often impossible for all the members of a family to sit down together for a meal. Thus a pot of soul food

family members help themselves to a plateful when they come home. This is the main meal of the day — other food being taken in the form of snacks at the supermarket or drug store. This pattern of eating is seen by some social workers as yet another index of black family failure, which is frequently used to explain away the problems of blacks in a white society.<sup>4</sup> But is it really any less indicative of family cohesion for people to help themselves from the same pot of food independently, than it is to sit down together, European or American style, to plates of food arranged to express the individuality and separateness of each person? Apparently it is considered so, for the 'inadequacy' of negro eating habits has been used to push programmes for free school meals. Dr. Shack argues that this provision undermines the cohesion of black families.

What emerged clearly from these papers is that traditional eating patterns cannot be fitted into western concepts of a 'balanced diet' such as the long-established WHO/FAO specification for a proper protein intake. Recent research has shown that 70 grams a day for an adult male is a highly ethnocentric judgement — a cultural norm masquerading as a scientific norm, and deriving directly from Western societies which are profligate in their use of food resources. Nor is it any surprise to find that in Africa and elsewhere endemic malnutrition is most common in just those areas which have been most influenced by western agricultural expertise, where traditional crop combinations have been replaced by cash cropping, and the basis of traditional meal systems destroyed. Here nutrition has come to depend on a few starchy staples together with imported processed foods.

Co-Chairman of the conference was Dr. Arnold Spicer, lately of Rank-Hovis, who told the conference that rats eat rationally because they choose their food for nutritional satisfaction, while men eat irrationally: a neat statement of the scientists' claim for a monopoly of rationality and a tacit rejection of the idea that there can be any good reasons for eating, apart from those



legislated for by nutritionists. While the latter paid considerable lip service to the need for respect in regard to people's ideas about food and the rules they use to assemble meals, one detected an undercurrent of irritation with such irrationalities. A term which came up frequently was 'food-freak' — a pejorative referring to those who prefer their food produced without artificial fertilizers, pesticides or additives. Whatever the nutritional arguments involved such people certainly use their food rationally to express deeply held moral views about the relationship between man and nature.

A theme which was not fully teased out at the conference was the relationship between the rules for assembling meals — which seems analysable in terms of social symbolism — and the way in which traditional meal systems seem to provide for adequate and balanced diets. It is simple to point to the convergence of social and nutritional values, but the mechanism by which this convergence is achieved remains mysterious. It is of course tempting to invoke Genetic mechanisms and in this light Vernon Reynold's lecture on carnivory in chimpanzees was interesting. From time to time chimpanzees kill and eat immature baboons, monkeys and ante-

lopes, which they eat in a way that can only be described as 'feasting', which shows a remarkable resemblance to certain human societies where starchy foods and legumes are the staple diet for long periods, with occasional feasts of meat. It is tempting to relate this chimpanzee behaviour to the brain's requirement for long-chain polyunsaturated fats which are only available in animal protein.<sup>5</sup>

Whatever the guiding forces involved in the evolution of traditional pre-industrial meals as both socially and nutritionally satisfying, it is clear that they were manifestations of economies which were self-sustaining, at least in the short term, and had evolved to make optimal use of the local environment. By contrast in industrialised nations, and in parts of the third world damaged by economic imperialism, meal systems have cut loose from the restraints of a local resource base. In fuel rich economies the trend has been towards elaboration and diversification of ingredients involving ever higher energy inputs and ever falling calorific efficiency. Nutritionists are employed in the production and marketing of food, to encourage us to buy more. In the hunger areas of the world traditional meal systems have become impossible as increas-

ing populations press harder on resources depleted and misused to provide export goods for the industrial world. Here nutritionists are employed to smooth the transition from traditional to imported foods. Ironically, left to themselves the natives choose foodstuffs like milled flour, export beer, polished rice, coca cola and chewing gum — edible symbols of progress and social advancement.

If anthropologists have a message for nutritionists it is that food is assigned complex and subtle meanings in traditional societies. Clearly these are not reducible to dietetic tables, nor does there appear to be evidence to show that the damage done to traditional social eating patterns is in any way compensated for when Western foods replace traditional ones.

Roger Gomm

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## Report

### NOT UP TO STANDARD

**GWYNEDD DENTAL HEALTH STUDY** by D. Jackson, P.M.C. James, W.D. Wolfe.

The most obvious fact which emerges from this report is that there are more decayed, missing and filled teeth in 5 and 15 year olds in Bangor/Caernarvon than in Anglesey. It is also clear that the proportion of faulty teeth which are filled or missing in Bangor/Caernarvon is about twice that in Anglesey. This indicates that the treatment practices are significantly different in the two areas. Such practices would grow up over a long period, which suggests that the differences in dental health are of long standing.

These different practices could have originated from different dietary habits leading to different treatment needs. Without a comparison with Anglesey children who had not had fluoridated water or with Bangor/Caernarvon children who had, no valid conclusion can be inferred about any effects of fluoridation because they could be minor compared with other effects.

The investigators excluded certain Anglesey children because they had not had fluoridated water. In my view they should have been studied to see whether they were more similar to other Anglesey children or to Bangor/Caernarvon children, or to children of rural Caernarvonshire. Every such opportunity was missed by the investigators, quite deliberately, so that no alternative explanation could be investigated by their figures. It is a very badly designed investigation by even the most modest epidemiological standards.

Actually it is pointed out on page 7 that after the study was finished it was discovered that, contrary to the suppositions made when the Anglesey children were selected, many were not subject to as much fluoridation as had been supposed. Instead of drawing the correct conclusion that this weakens the hypothesis that the differences are due to fluoride, as any proper statistical investigation would show, because the correlation would be reduced, the authors state that the differences would have been greater had the full fluoride dose been administered: that is to say they admit that they are begging the question.

The investigation, from their viewpoint, appears to have been to measure the effect of fluoridation, not to demonstrate that there was an effect.

A very serious omission is that the fluoride content of Bangor/Caernarvon water was not, apparently, measured, although it is stated to be less than the so-called optimum of 1 part per million fluoride. If it is known what it is, the concentration should be stated. There is no attempt to assess the fluoride intake from other sources. In this respect the drinking and eating habits of the two areas could be significantly different. The consumption of imported soft drinks would be likely to differ, and possibly tea-drinking habits as a function of age, too.

It is well known from studies in different parts of the world and from abrupt changes of diet, such as in Greenland and in wartime Britain, that sugar-containing confectionery and manufactured foods in general are the chief cause of decay and it would be more reasonable to ascribe the differences in Anglesey and Bangor/Caernarvon to such causes, especially as various types of food are not obtained by children with equal ease in the two areas. School practices could, equally, differ significantly.

The reports of the medical officer of Anglesey contain figures of the proportion of school children requiring dental treatment each year. This proportion has not shown a significant change since before fluoridation was introduced. If anything there has been a slight

increase. The inference from these figures would be that fluoridation is not the cause of the difference between Anglesey and Bangor/Caernarvon because, presumably, it has been there since before fluoridation.

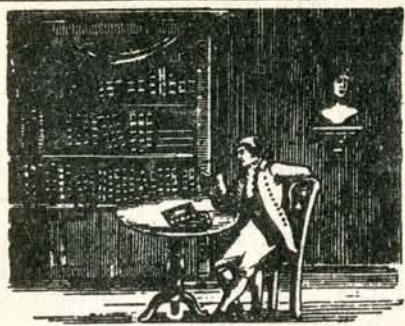
Since these facts were known, or at least were available, it is very surprising that the investigators considered no other possible cause of the difference. When Anglesey was chosen for a pilot scheme no comparative study was made, nor has been made till now, to study these differences, and it seems that those who have remarked on the better teeth in Anglesey have only noticed what has been there for a long time, but have attributed it to fluoridation which came later! Not merely have they said "post hoc, ergo propter hoc", which is known often to lead to error, but have said "ante hoc, ergo propter hoc", which is nonsense.

The investigators admit that they do not know the cause of mottling of teeth. It is widely attributed to fluoride because it is observed in cattle suffering from extreme fluorosis. At the same time the literature on fluoridation nowhere attributes decay to lack of fluorine, and certainly does not claim to have demonstrated this. While the investigators write off mottling they discuss no mechanism whereby fluorine can reduce decay. It has often been suggested that, if there is any effect, it may be that it delays the eruption of teeth and the loss of deciduous teeth. The fact that the five year olds in Bangor/Caernarvon had lost twice as many teeth as those in Anglesey would seem to support this hypothesis, and it could well be as good an explanation as any for some observed effects. Yet no attempt has been made in any investigation of fluoridation to elucidate this matter. Indeed this study is as disappointing as all the others in that by its design it could not reveal anything at all about mechanisms, or possible causes of differences other than fluoridation of water supply.

The study does not come up to the standards worthy of a university, nor would it merit publication in a reputable journal.

R.S. Scorer





## Books

### UTOPIA?

**THE FUTURE OF CITIES**, edited by Andrew Blowers, Chris Hamnett and Philip Sarre. Hutchinson Educational and Open University Press (Open University set book). £2.25.

**THE LARGE CITY, A WORLD PROBLEM**, by Ursula K. Hicks. Macmillan, £6.50.

Some years ago there was a plan to build a linear city stretching from Colchester to Felixstowe. I lived in East Anglia then and I remember that the plan was abandoned mainly because of the opposition of Ipswich traders who feared that the centre of the new city would be moved away from existing shopping areas. Similarly, attempts to ban private cars from small coastal villages during the holiday season usually encounter stiff resistance from shopkeepers who equate long lines of cars with business, apparently unaware of the fact that until cars can enter their shops, the prisoner in a slow-moving line of traffic is hardly in a position to embark on a shopping spree. Bypasses meet the same objections. It is quite irrational and the fears are not stilled by accounts of other towns that have banned cars or opened by-passes and found their trade improved. Irrational it may be, but it is human, and the best-laid plans have often foundered on the rocks of our emotional reactions.

Perhaps we should bear such stories in mind as we read of ambitious plans to improve, develop or renew our towns, and wonder at the gap between the planners and those who must live on with the results of their endeavours. Not only do most planners know

nothing about the assessment of human psychological needs, they have only the haziest notions about how to sample opinion in order to discover what people say they would like. The gap will be filled eventually. Environmental and architectural psychology is attracting a growing number of psychologists — who do know about human needs — and one day their voices will be heard. Until then we should not be surprised to find that the few contributors who mention psychological needs or, in the case of the excerpt from Barbara Ward's and Rene Dubos' *Only One Earth* plead for their recognition, are lost in the wilderness of *The Future of Cities*, amid the planners and their plans.

All the same, this is an excellent anthology, well up to the high standard demanded by the Open University for its set books. Its approach is historical, tracing the development of thought about urban areas from Sir Thomas More's *Utopia*, through Swift, Le Corbusier, Frank Lloyd Wright and Ebenezer Howard, to the planners of today and, sometimes ominously, of tomorrow. A passage from *A Blueprint for Survival* is used to show that goal-oriented planning is likely to be more radical than the usual ad hoc approach to the solution of immediate problems.

The final section of the book contains visions of the future. Alvin Toffler is there, together with Michael Davie, who argues that Californian levels of mobility obviate the need for cities, Peter Hall and Colin Leicester, both of whom look euphorically at a rose-tinted pink plastic chiffon wonderland of a Britain by the magical year 2000. More chillingly, Clifford Simak, Aldous Huxley and E.M. Forster consider the implications of man's subjection to the technologies he has devised to serve him. Indeed, the book ends with Forster's short story *The Machine Stops*, in which mankind has become entirely dependent on its technology, with individuals living in underground cells linked by a global communications network to their fellows and to their life support systems. The machine stops.

In places the jargon of the planners makes the book difficult to read for those more familiar with English, but nonetheless it contains a great deal of useful information and its 344 pages are good value.

Lady Hicks adopts a panoramic, rather than an historical approach. Her knowledge of local government is encyclopaedic and she uses it with great skill to demonstrate the universality of most urban problems. She devotes about one third of her book to Japan, which she has studied in detail, and which provides useful examples for less developed countries of the consequences of an economic growth that proceeds too rapidly for it to be controlled by the traditional governmental structure. Her main concern is with the less developed countries and her solutions — for she proposes solutions as well as identifying problems — are not based on simple growth, which she rejects in favour of a more labour-intensive, self-help response that might yield substantial benefits quickly with a minimum of capital investment.

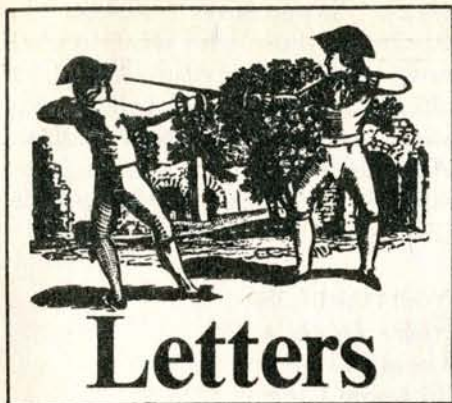
The financing of governments is central to all the issues she raises and, again, she provides a broad view of the methods that have been and might be adopted in different countries to raise revenue and to budget its expenditure. Some attempts have been bizarre: Nigerian cities imposed at one time a tax on drummers!

The subject matter could be very dull, but the book is not. The descriptions of problems are fleshed out with colourful and often amusing illustrations, such as the plight of the bus drivers of Lagos whose vehicles were so dilapidated that they had to keep the engines running all night for fear they would not start in the morning!

*The Large City* contains much detail that will be of use to anyone connected with local government who needs to see his own situation in a wider context and happily, since all of us are involved in local government if only as voters, the book is well written to make it always intelligible and often fascinating to the general reader.

Michael Allaby





# Letters

## The Ecological Value of Domestic Cattle

Dear Sir,

The letters from readers that you published following Robert Allen's article on meat-eating versus vegetarianism were all one sided. As this is a question of supreme importance for the whole world surely the non-vegetarian point of view should be expressed too.

I have lived in lacto-vegetarian countries (e.g.: the Punjab) where the people showed every sign of good health. In tropical countries where pulses (gram, soya, etc.) can be grown with ease, a very good diet is possible from only vegetable and milk produce. But, as I found in the Punjab, the strictly lacto-vegetarian diet when followed by the bulk of the population, poses one insoluble problem. What do you do with your bull calves and your surplus heifer calves? You can keep a small proportion of your heifer calves for dairy replacement, and in India a very small proportion of your bull calves for draught purposes, but what do you do with the much larger proportion that is surplus? In India the answer is turn them out to starve. That is exactly what happens to them as anyone who lives in Hindu India and uses his eyes will tell you. A cow, to give milk, must have a calf every year. Thus in a life of twelve years of milking she will replace herself twelve times. Each of the heifer calves she produces will also reproduce herself twelve times. The mathematics of this are simple.

Right then — must you be a vegan and allow no cattle to exist in the country at all? If you were a cow — what would you think of this solution? We have four alternatives:

to suffer large herbivores to exist but to control their numbers ourselves. To suffer them to exist and introduce carnivores such as wolves or tigers to control them. To suffer them to exist and allow starvation to control them. Or to suffer them not to exist at all — i.e. eliminate them.

Then the argument put forward by Mr. E. J. Thompson that the carnivore is to be pitied because he has to get his long chain fatty acids from dead herbivores is nonsense. Because, as vegetarians all seem to forget, carnivores are vegetarians too. We can eat as many vegetables as we like. We have the benefit of eating meat — but we also have the benefit of eating vegetables.

The argument that herbivores only convert a proportion of the food we give them into meat, and waste the rest, is also nonsense. They don't waste a thing. What they don't convert into meat is turned into the most marvellous manure for the soil. There is a benign circle — soil — plant — animal — soil — plant, and we break it at our peril. For a fertile soil without animals we need chemicals which are produced with a great expenditure of energy and are polluting.

A further point — all the vegans and vegetarians I know in this country derive most of their protein from the tropics. A vegetarian in a temperate climate should surely be able to depend on vegetable proteins produce *in that climate*. To buy pulses and ground nuts and all the rest of it from tropical countries where the food is desperately needed by hungry people is just *wrong* and there is no other word for it. Just as it is wrong to buy animal feeding stuffs from such countries; vegetarian or omnivorous we must devise an agriculture which is supportable from our own land alone.

What every person eats is his own concern, but to try and force vegetarianism on the whole country would be ecologically unsound, would deprive, ultimately, the large herbivores of the right to exist, and would starve the soil of what is necessary for its health. By all means let us boycott completely

“factory-farmed” meats, eggs, etc. By all means let us insist that all animals are treated humanely and in the most natural conditions possible. By all means let us end the present system where animals are transported hundreds of miles in the backs of lorries, to be slaughtered. But humane slaughter is absolutely instantaneous — and we all owe God a death.

Sincerely,  
John Seymour  
Fuchongle Isaf,  
Newport.

## Man and Art

Dear Sir,

I should like to agree with Peter Schofield that “Art is the expression of man's sense of identity with his environment.” (The Ecologist, January 1975.) Alas, it isn't. Art as we know it, particularly within what we call the history of art, has been the projection of man outside himself; a condensation and a symbolic representation of man's experience. Art has been an articulation of new experiences and sensibilities of the human species. As such it has been a medium between Man and Nature, Man and other men. For, as I have argued in my “The Myth of Progress” (The Ecologist, Vol.4.No.7), we are never naked, we always interact with the world and other people via the medium of language, of technology, of art. Art is both the medium that brings us back to Nature, and at the same time it is the medium that estranges us from Nature and environment.

Yours faithfully,  
Henryk Skolimowski,  
St. Anthony's College,  
Oxford.

## Hay Making Made Foolproof

Dear Sir,

Peter Bunyard's excellent article (January 1975) mentioned that he intended to buy a machine for mowing as scything is too slow in this unreliable climate. For others with a similar problem it may be a relief to know that hay making can become “weatherproof” if one uses tripods. They are easy to make and easy to build once you learn the knack (it took us about two days and one failure). One need only cut



as much hay at a time as can be put on the tripods — it doesn't have to lie out and get rained on. Once on the tripods it can dry there and await a convenient moment for "leading" in. It can stay there all winter if necessary and will come to no harm. This way you cut when fine, and stop worrying about the cut hay. We learned this from Newman Turner's book *Fertility Farming*, still, after twenty years, the best thing we've found on the subject. It works even for beginners like ourselves. It also explains farming without a plough which is marvellous for people who can't afford two horses or a tractor, and produces better crops as well.

Yours faithfully,  
Rosemary Haughton,  
Castle Douglas,  
Kirkcudbrightshire.

## The Case for New Villages

Sir,

I am concerned about the statement near the beginning of Peter Stables' otherwise excellent report on self-sufficient initiatives at Aberfeldy (*Ecologist* Feb. '75) that "we must . . . be wary of reports from groups proposing to form a community a la Blueprint, 'to see how it works'." He may have some reasons for his doubts about small groups attempting 'instant self-sufficiency', but these should not be lumped together with much longer-range proposals for well planned 'new villages' aiming at a largely self-sufficient economy and an ecological balance.

Such villages, if they can be developed against all kinds of opposition and doubters, will be more similar to natural villages, such as Aberfeldy (as they were before their life blood was sapped by tentacles of transport) than to any current communes experimenting with self-supporting agriculture, and generally with communal living as well. All small experiments, whether of long or short duration also contribute to the pool of applied ecology, specially when their experience is well documented. (cf. Peter Bunyard's article in *The Ecologist* January, '75.)

But if we continue to leave experiments in ecological living to small communes and to the remaining villages of our depopulated countryside, the ultimate chaos, as it becomes increasingly difficult to feed the parasitic urban centres, will be that much the greater. We should be planning now for viable alternatives, of which new villages, to my mind, is the most not the least realistic. Many of the obstacles are not natural or practical but *political* and *psychological*, and there will need to be a change in attitudes and in planning laws and land tenure, if a real 'back to the land' movement is to succeed. Nonetheless if we can build such ecological inanities as new towns, with their built-in need for motorised transport, new villages should not be all that difficult. Nor would they need to 'spoil' the countryside; they could actually enhance it as John Seymour pointed out so well in the new edition of *Fat of the Land*. So while we wait and

watch 'progressive' villages like Aberfeldy those who want to work now towards a realistic ecological alternative 'a la Blueprint', may wish to join the New Villages Association, which is planning eco-villages of about 1,000 people. (Send me a s.a.e. for more info.)

Yours faithfully,  
Roger Franklin,  
Loam Cottage,  
36 Loom Lane,  
Radlett, Herts.

## Editor's Ego Trip

Dear Sir,

I have been taking *The Ecologist* for some years now, but shall cease to do so if you continue to turn this potentially important journal into your own personal ego trip.

The pace is hotting up, the crisis is growing more acute every week — do you really think this is the time to fill no less than fourteen pages of the February issue with a meandering woolly piece of your "philosophy"? Clarifying ideas is important — but not at this length, and certainly not in a publication which should act as a clearing house and meeting point for a wide range of ideas, ecological news, practical suggestions and so forth. Why did you drop the FOE contribution? Why are there no more pieces on organic agriculture and horticulture? Why don't we get news of alternate groups?

Sorry if this sounds harsh criticism. But I am concerned for the fate of *The Ecologist*, and I cannot see it growing into a powerful and influential publication if it becomes increasingly your personal mouthpiece.

Hugh de Paul  
Gray's Inn Road, London

*It is still currently assumed that there is an engineering solution to environmental problems. The emphasis both in Government departments and in the academic world is on such solutions. My colleagues and I feel that the problem is essentially one of values. Neither science as it is today nor*

## Data on Garden Produce Wanted

Dear Sir,

One of the problems facing one planning for the first time which crops to grow in his garden or allotment, is that very little information is available concerning fruit and vegetable yields. That data which does exist is often on the optimistic side and takes no account of regional variations and soil differences.

The H.D.R.A. as part of its experimental programme, will this year be asking members to select one or two garden crops and accurately measure the amount of food they get. It is hoped that we will get sufficient replies to be able to compile more correct vegetable yield statistics. In addition we are investigating intensive crop rotations to try to extract the maximum food production from a small area of land.

If any reader of *The Ecologist* would like to help in the above survey, would he or she please send a stamped addressed envelope marked "Fruit and Vegetable Yield Survey 1975" to the address below, for further details.

Alan Gear

Deputy Director

Henry Doubleday Research Association

Bocking, Braintree, Essex.



technology nor industry can solve our problems. They can only mask the symptoms of the very profound disease society is suffering from. Unfortunately, the correct diagnosis of this disease, the formulation of proper remedies and their adoption are impossible under the present values and in terms of the separate disciplines into which knowledge is at present divided. Everything must in fact be re-examined and reformulated. The Ecologist is perhaps the only paper trying to do just this and we intend to continue to do it. Articles on the subjects you suggest we should be dealing with can be found in many other periodicals, though when they are important we also deal with them.

Editor

### Norwegian People Reject Nuclear Power

Dear Sir,

I am an American student in Norway, and have discovered your magazine while studying ecology here. I find it very interesting, although quite depressing at times. I thought for a change you might like to hear about what could be one of the major positive environmental events of the year — Norway's rejection of nuclear power.

This is becoming more and more likely every week. Several youth organisations have joined together with environmental groups in a common effort to stop nuclear power from coming to Norway. A ring covering the whole coastline of southern Norway has been formed, and new groups are joining it all the time. Norwegian industry and utilities seem quite confident that nuclear power will be adopted despite a recent Gallup poll that showed 75% of the Norwegian people were against nuclear power in their district.

Almost daily there is an article in one of the major newspapers reporting some problems with nuclear power in other countries, or giving the latest report on how safe it is. More and more Norwegians are joining one side or the other. For example recently a Norwegian engineer association has come out in favour of nuclear power, while 1000 agricultural students all over

the country have formed an organisation against it. There are plans to have a massive sit-down strike at the first planned site, if the Storting approves nuclear power.

It is also probable that the coalition of groups now working together against nuclear power will stay together to deal with other environmental problems with increased vigour if they are successful in the nuclear power fight. The movement could gather strength and momentum and result in Norway becoming one of the most ecologically sane countries in the world. Norwegians are very much a nature loving people and with their small well educated population, feel they can have an influence on the direction of their future society.

Yours faithfully,  
Andrew Wright,

*We cannot answer your letter personally because you gave us no address.*

Editor

### Faeces, Food, and Drinking-water

Sir,

Work in this laboratory with human faeces has demonstrated that after homogenization, followed by steam sterilization, at 15lb/square inch (121°C) for eight hours, then oven drying at 100°C and final cooking, the result (when feelings of revulsion have been overcome) is not unpalatable.

It is known that dry faeces contains about 6% of total nitrogen or more than that present in many lean meats.

When famine threatens, human faeces properly prepared, may have some dietary merit. There is certainly a case to be made for its use in animal feeding, and by the resultant reduction in the possibility of river and source-water contamination.

Yours faithfully,  
C.D. Reed and J.A. Tolley,  
Municipal Laboratory,  
Dept. of Civil Engineering,  
University of Liverpool.

*Absolutely... I am sure that coprophagia will soon be regarded as a sine qua non of scientific progress.*

Editor

## This Month's Authors:

### Graham Searle

Graham Searle is Campaigns Director of Friends of the Earth, Director of Earth Resources Research and an Associate Editor of The Ecologist. He has just returned from a year's study of New Zealand forestry practices and is author of a book on the subject entitled *Rush to Destruction: An Appraisal of the New Zealand Beech Forest Controversy* for details write to F.O.E., 9 Poland Street, London W1V 3DG.

### Allan Rodger

Allan Rodger is Senior Lecturer in the department of Architecture in Edinburgh and has recently taken up a Chair in Architecture at the University of Melbourne.

### Goran Backstrand

Goran Backstrand is a graduate of the European Institute for Business Administration and is head of the Public Administration section at the Swedish Ministry for Foreign Affairs. He is at present assigned to the Secretariat for future studies.

### C. Richard Tracy

C. Richard Tracy is Assistant Professor in the Dept. of Zoology and Entomology at Colorado State University.

### Donald H. Gray and J. C. Mathes

Donald H. Gray is Associate Professor of Civil Engineering and J. C. Mathes is Associate Professor of Humanities at the University of Michigan.

### Richard Carder

Richard Carder is a music teacher and composer who says he "started as a scientist until I saw the light".

### Roger Gomm

Roger Gomm is a lecturer in Sociology at Stevenage College, Herts.



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THE ALEXANDER TECHNIQUE AND ITS VALUE IN BACK DISORDERS by Eric de Peyer, obtainable from Secretary, 7, Wellington Square, London, SW3 4NJ. 15p post free.

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Dr. A. Deavin,  
Ewell Technical College,  
Ewell, Surrey.  
Tel: 01-394 1730

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## FOR SALE

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## HOLIDAYS

SUMMER HOLIDAYS IN SWITZERLAND: Environmental Editor offers to English family a house for two weeks on bio-dynamic farm in small, intact village in Zurich area. Payment: another two weeks help on our muddy mountain (elsewhere) trying to bring property into livable shape. English our household language. Contact Peter Brenner, Unterdorf, CH-8933 Maschwanden, Switzerland.

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## PUBLICATIONS

### Noise and Prices

A. A. Walters

This study analyses and measures the economic effects of aircraft noise on principles that can be applied to many other kinds of environmental pollution. It shows that there is a widespread demand for residential quiet and that the price of a 'unit' of quiet as reflected in property values is remarkably consistent in the United States and in Britain. £3.75

### Power Over People

Louise B. Young

This book reveals the extent to which high voltage lines impose danger and inconvenience upon the people living near them. It deals with the accelerating consumption of electricity and sets forth ways in which legitimate power needs can be met without damage to the environment. Illustrated paper covers £1.75  
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Issues, Ideals and Environmental Dilemmas  
Edited by Lon C. Ruedisili and Morris W. Firebaugh

This collection of contemporary readings will convey to non-scientists the complexity of our present energy crisis, the wide diversity of expert opinion about how to handle it, and the environmental problems posed by various alternatives. £6.25 paper covers £2.90

Oxford University Press

### GLAMORGAN POLYTECHNIC ENVIRONMENT GROUP

held a highly successful 1 day symposium on 20th February, 1975. Sir Kingsley Dunham, FRS, Colin Blythe and Dr. T.D. Lusty spoke on "FUEL FOOD AND FAMINE".

Advance orders are invited for Proceedings to be soon available for £1.00 from Mr. F. Slaughter, Glamorgan Polytechnic, Llantwit Road, Treforest (Pontpridd).

Copies of 1974 Symposium entitled "2001: Challenges and Responses" are still available.

## PERSONAL

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**SMALL ISLAND VILLAGE** is working towards paradise. 4-hour working day, hopefully swimming pool and sauna soon. Only people really interested in self-sufficient community need apply. No druggies. Box PD 76.

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CLAP  
c/o BIT Free Information & Help Service, 146 Great Western Road, London W11. (Tel: 01-229 8219).

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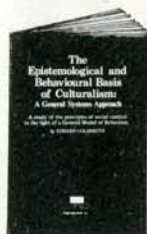
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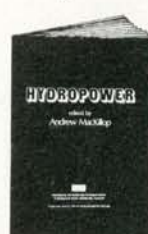
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