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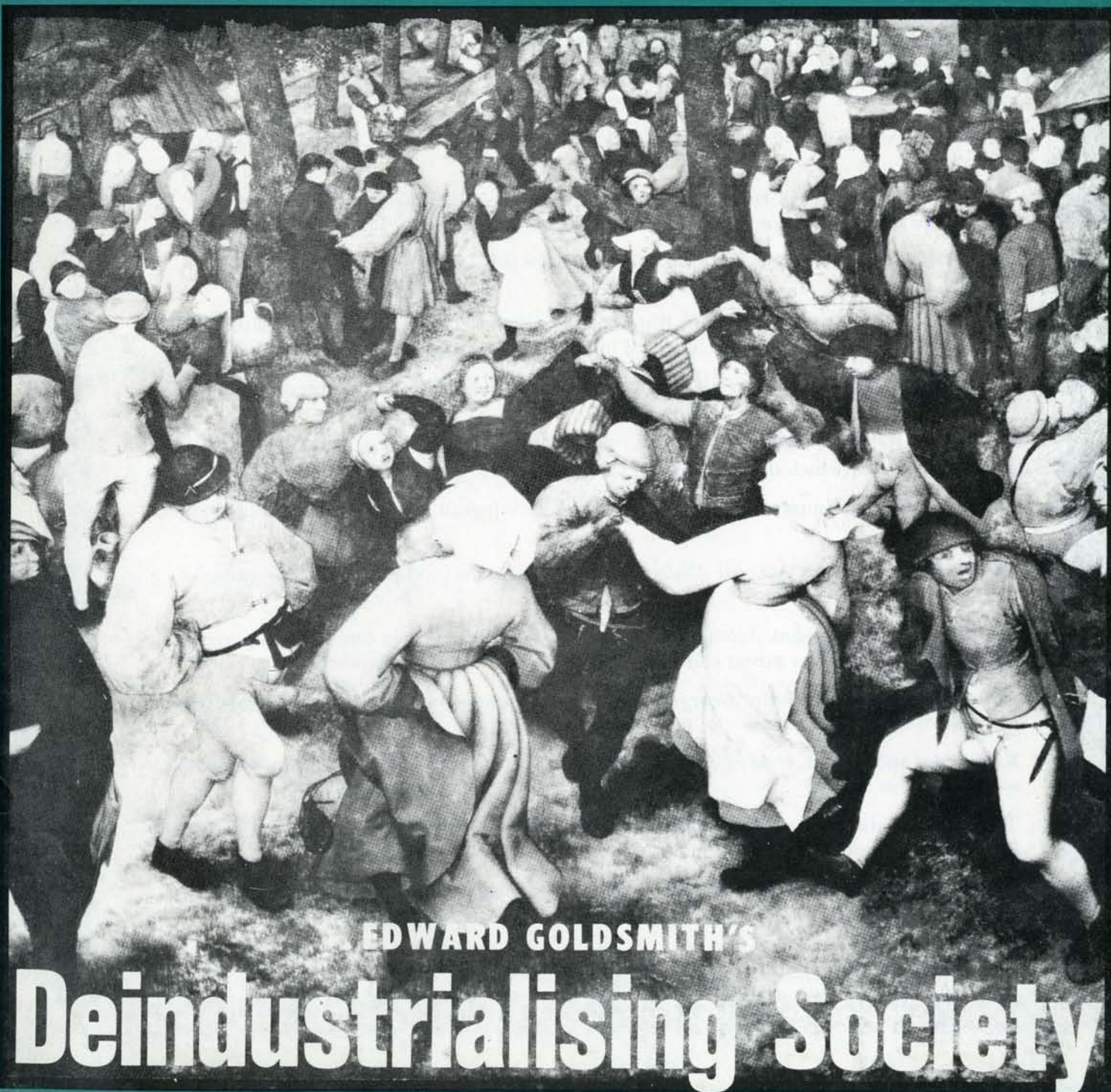
# Ecologist

Journal of the Post Industrial Age

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**Industrial and Post-Industrial Images of Man  
The Return to Traditional Agriculture**



EDWARD GOLDSMITH'S

# Deindustrialising Society



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## GUEST EDITORIAL

# IN DUBIO PRO VITA!

In a fast changing world, a thing initially created for a "good" purpose and which even served it for some time, may become not only ineffective but counter-productive as time goes on. Such cases can often be attributed to the dull inertia of maintaining the "thing" in question — which may be an institution, a law, a practice, an attitude, or a technical gadget — in modified circumstances, its starting point and fundamental motivation having long gone out of sight.

The illusions and disillusion of Progress with a capital P can to a large extent be explained by this basically simple mechanism.

Thus the concept of a centralized, sovereign nation state was a step "forward" in a feudal system. To-day it blocks the problem solving and evolutionary faculties necessary to arrive at a democratic and pluralistic post-industrial system.

A technical example: the motor car appeared to be Progress in "ceteris paribus conditions", i.e. assuming that all the rest of the system stays put while the people owning a car have *in addition* a powerful means of transportation which may be used at their convenience. It turned out that the overall system did not stay put at all, that instead it changed qualitatively as a consequence of this unreflected non-anticipative innovation.

Nowadays, people are forced to use new gadgets when they would prefer not to, and not to use them when they would like to do so. More important however, the social costs of most innovations turn out to include unforeseen side-effects such as an increasingly depressing and unhealthy environment, pernicious personal dissatisfaction, growing dependency of a new type, spreading of societal disintegration.

In the legal field the same mechanism generates an exponential increase of provisions and regulations to cope with metastatizing side-effects, as laws become counterproductive. In the linear logic of cause and effect now prevailing, laws are devices for long term control and steering of a hierarchical machine, i.e. to form, deform or suppress reality. A self-regulating living system on the contrary shows no interventionist controls but the structures themselves provide the feedback and feedforward forces needed for adaptation and evolution. Formalized laws are not needed in

equilibrium societies, its societal norms being symbols or myths which *represent* an underlying and all-pervading reality rather than enforcing it. But this has long been changed in our part of the world.

The "in dubio pro reo" principle is a good example of the fact that abstract principles a) have become indispensable to fill the voids created by destroying cultural feedback loops while constructing ever increasing power hierarchies, and b) are increasingly unable to fulfil that function as the workings of the Great Machine become obscured and as its *raison d'être* becomes separated from Man and his destiny. Let us look a little bit more closely at this example. In stipulating that the accused should benefit from the doubt, Roman law was concerned with doubts on facts, not on ethics, whereas the reason to do so was downright ethical: protection of the weak. In hierarchical systems, even in those of mythical legitimation such as the Roman Empire and its epigones, doubts have crept into factual evidence: "isolated" events, singularized objectives and sovereign individuals appear, the tightly woven net of immediate relations is partly torn. Here arbitrariness has to be checked if only to avoid, in the relationship between the all-powerful Machine and its subjects, extremes which would be in contradiction with the legitimizing ideology.

In our demythified power machines, transcendent meaning has evaporated and naked survival is the order of the day. Terms such as justice and equity merely signify that we have to provide a minimum of prerequisites so that the final blocking or self-destruction of the more and more complex and vulnerable Machine be avoided. This is a rather meagre goal, but even this absolute minimum is far from being assured.

"In dubio pro reo" means to-day not only to acknowledge the possibility of factual error when deciding upon the fate of an alleged criminal, it also often means to deny protection of the helpless against the possible menaces of mega-technological innovations.

The most striking example of the counter-productive side of the "in dubio pro reo" principle is nuclear power and in particular the Plutonium issue. Potential victims (and the advocates of the overwhelming majority of the potential victims, i.e. the next 1000 generations) are forced to revert to illegal action in order to reduce the margin of doubt which is exploited



in favour of the accused, i.e. of all institutions having previously engaged in pro-nuclear decisions: governments, commercial enterprises and labour unions. In addition it appears that the "accused" practically control and condition most holders of formal expertise.

This is not the place to expose the scientific base of the plutonium hazard, suffice it that already it is highly probable that a fraction of a millionth of a gram of reactor-grade plutonium will, when inhaled or metabolically assimilated, cause cancer of the lung, the liver or the bones. Such quantities are too small to be found in a posteriori analysis (autopsy) by present techniques, rendering it virtually impossible even to claim indemnities except in cases of a hundredfold "overkill".

Accidental or wilful spreading of plutonium cannot be excluded. As a matter of fact at least three accidental spills have occurred in the US (Rocky Flats, Colorado; Maxey Flats, Kentucky; Hanford, Washington) involving a total quantity of plutonium which has been estimated to be of the order of 50 kg. Although wilful release of Pu containing material to the North Sea, the Irish sea and the Western Atlantic has been practised for many years; respective quantities have never been published. Criminal or political use of Pu for terrorist or blackmail purposes has not been reported up to now. Motivational potential for such actions is, however, building up fast and expertise will no doubt join this potential, in particular if the proliferation of nuclear installations all over the globe continues as planned.

The great question is, to what extent do long life alpha emitting actinides such as plutonium enter biological cycles. In sufficient quantities they could contaminate the bio-mass of the earth for virtually eternity (ten half-lives of Pu 239 correspond to 234,900 years), thus they could destroy all forms of life having long reproduction cycles such as Man. Polluting agents such as pesticides and certain intermediate compounds in plastics production have been found in regions thousands of miles distant from their origin, indicating very effective mechanisms of global dispersion. On the other hand, many processes of concentration of toxic agents in certain points in the interactive biological network are well known.

Until rather recently most specialists have assumed that plutonium oxide (the form in which this material is generally used) is almost totally insoluble in water and in the digestive apparatus, so that "only" inhaling the dust or allowing it to enter the skin through wounds or abrasions were considered dangerous. Other inorganic compounds are, however, known to be several hundred times more soluble and recent measurements seem to indicate that under the action of micro-organisms of the soil and of the sea, organic compounds may be formed which can be rather easily assimilated by living cells. (This phenomenon would be comparable to the Minamata case in which inorganic heavy metal compounds (mercury, cadmium) reputed to be virtually insoluble were released by a chemical factory to an estuary region where they eventually turned up in fish and sea-food, killing or paralysing thousands of Japanese.) Moreover, the take-up even of inorganic plutonium by newly born rats is about a hundred times

faster than by adult rats, which leads us to believe that human babies are also much more vulnerable to Pu pollution than grown-ups. Finally there are certain indications that Americium, an actinide, the 241 isotope of which is built-up by disintegration of Pu 241 with a reaction half-life of 13.2 years, is much more easily absorbed by plants than plutonium: Am 241 presents therefore a similar biological danger as plutonium even though its half-life is "only" 458 years.

The fear that nuclear fission could lead to the extinction of all higher forms of life on earth is plausible. It is not definitely proven, expertise being contradictory, insufficient or biased. Under these circumstances is the application of the "in dubio pro reo" principle acceptable? Or should we rather fight for another principle: "in dubio pro victima"?

Before answering this question one should also consider a number of arguments often brought forward in favour of maintaining fission technology:

- 1) certain biological toxins may kill in even smaller quantities and with faster action;
- 2) other dangers of our industrial society claim millions of victims each year but are nevertheless accepted;
- 3) nuclear weapons are here anyway and we can do nothing to stop them.

Let us see how we can counter these apparently formidable arguments.

- 1) It is true that such toxins exist, but they are unstable and can be destroyed or neutralized by easy means (e.g. boiling).
- 2) It is true that about one million people are killed each year in the industrialised countries by professional illnesses, work accidents and car accidents. It is also true that the mortality rate of all age groups above one year has increased in many of these countries since the 1960s and that cancer rates have doubled since the war, about 90% of all cancer cases being attributable to aspects specific to our civilization: pollution (including Pu from spillings and fallout), food additives, excessive psychosomatic stress and combinations of these different factors. These facts are not "accepted" but fatalistically endured if not ignored or repressed. They are indeed unacceptable. Ignorance and patience may soon come to an end as the glamour of this civilization continues to erode. What would happen if only one out of every thousand of those with cancer in 1980, decided to kill or sabotage what they took to be the cause of their illness and misery? One million desperate people — who even armed police could not hope to control.
- 3) To justify one absurdity by another is doubtful logic in particular if each absurdity multiplies the menace to the other.

Should we not conclude that utter radicality is needed now? It is indeed. But this radicality concerns the meaning, not the means. We must defend the "radices" — the roots of life on our planet, clean the physical and mental soil from garbage and poison. "In dubio pro reo" does not suffice for this. The first priority principle of a humane order must now be: "In dubio pro vita"!

Manfred Siebker

# INDUSTRIAL AND POST-INDUSTRIAL IMAGES OF MAN

**by M.H.SIEBKER**

**Industrial Society is designed to satisfy what are generally regarded as human needs, if it does not do so it is that our image of man and his needs is wrong. A post-industrial society must be designed to satisfy a very different set of needs based upon a more realistic image of man.**

Our societies are undergoing a fundamental change of which the apparent crisis of energy, ecology, economy, North-South relations, terrorism, criminality, ungovernability, disintegration of the social fabric etc., are only the more apparent signs, the tip of the iceberg. Value nihilism, distrust and lack of confidence in the future have become generalized. In this climate it is understandable that postures of short-term expediency and recklessness prevail. These, of course, can only worsen the situation.

It is commonplace that all human values are more or less ambivalent and prone to perversion if pushed

to extremes: entrepreneurship becomes exploitation, competition becomes aggression, freedom becomes arbitrariness, welfare becomes subjugation, tolerance becomes nihilism, individualism becomes egoism, solidarity becomes complicity. In the political field integration becomes uniformity, efficiency becomes domination, and a great ideal, A European Federation for instance, is reduced to the trade mark of a superlobby.

Why is it that modern societies and in particular our European ones have not been able to avoid these perversions? What does that mean

for the goal of a united Europe? And what might be our conclusions for the role of research and development in the effort to arrive at a viable post-industrial society?

It is my contention that considerations about the "guiding image of man", about this concept present in our subconscious mind as well as in the transpersonal regions of shared consciousness, will help us to understand what is going on. The prevailing images seem to be unadapted to the exigencies of our time; at the same time they loose coherence and are ever less able to constitute a balanced system of societal values which would avoid being perverted,



and which would be reconcilable with the main societal goals.

Rapid change seems to be the only constant of our time. This change has contributed to a contemporary feeling of purposelessness and meaninglessness:

- it creates uncertainty and lessens the "durability" of our images of humankind;
- societal structures of virtually incomprehensible size and complexity have emerged;
- segmented roles for the individual have proliferated, supported by fragmented imagery.

Such rapid rates and magnitudes of change would be tolerable if the change seemed purposeful. As Gerald Heard paraphrases William of Orange, "Life does not need comfort, when it can be offered meaning, nor pleasure, when it can be shown purpose." Since a primary function of images is to provide meaning in life, our present alienation and loss of purpose is reflective of the inability of contemporary images to inspire within people a feeling of meaningfulness. What looked glamorous and promising, the notion of progress itself, comes under suspicion.

To quote Galbraith: "I am led to the conclusion that we are the servants in thought, as in action, of the machines we have created to serve us." The industrial revolution in modern times refers to more than machines and markets; it refers also to the people and institutions locked into a network of relationships dominated by economic and technological forces. The image inherent in this setting could reasonably be described as "economic man": rationalistic (able to calculate what is in his own self-interest), mechanistic (a factor of production), individualistic (with the responsibility to take care of himself), and materialistic (i.e. economic forces acting as primary if not exclusive reward and control mechanisms). Since the first industrial revolution, humans as workers were no longer a part of the organic whole of society; rather, the person, the labourer, became an objectified and standardized component of the production process. On the other hand, since the Renaissance emphasis has shifted from collectivism to individualism

and happiness is no longer something to be gained in an afterlife — happiness is expected in this life. This was grounded in a faith that the future would prove to be congenial or at least neutral to the strivings of the individual (Heilbroner) a

**"No civilization prior to the European had occasion to believe in the systematic material progress of the whole human race; no civilization drove itself so relentlessly to an ever-receding goal; no civilization was so passion-charged to replace what is with what could be; no civilization had striven as the West has done to direct the world according to its will; no civilization has known so few moments of peace and tranquility."**

**(Woodruff)**

faith corresponding with that in the power of science. A third belief was inseparably linked to the two preceding ones: that if every man pursued his own self-interest for material gain, then the well-being of society as a whole would be enhanced. These beliefs are now

shattered just as earlier theocratic beliefs of medieval societies were shattered. This faltering occurs, ironically, at the zenith of the impact of the modern European ideology upon the world.

"No civilization prior to the European had occasion to believe in the systematic material progress of the whole human race; no civilization drove itself so relentlessly to an ever-receding goal; no civilization was so passion-charged to replace what is with what could be; no civilization had striven as the West has done to direct the world according to its will; no civilization has known so few moments of peace and tranquility." (Woodruff)

Table 1 shows social obsolescent premises typical for the recent industrial era.

The first premise turns out to be illusory and in the end self-defeating, both individually and collectively. The falseness of the second and third premises is being exposed by science as well as by the increasing existential reactions of man to the destruction of both nature and societal coherence. The fourth premise reveals itself as a dogma which no longer stands up against the question of meaning and permanence. The fifth and seventh premises come up against systemic contradictions in an interdependent society with democratic aspirations: moreover their limited view of the world and of man becomes more and more apparent. Premise six, which previously seemed to make sense in a world in which human relationships have been increasingly those of the market place, can no longer be maintained in the light of our increased self-knowledge.

"... one may fairly say that what business stands for, ideologically insists upon and tries to get adopted as general principles of conduct, run directly against, and reduce the chances of evoking affection and love as principles of relationship ... in promoting themes quite inimical to identification, affection, and significant membership, business thereby and to that extent, tends to bring out, standardize, and reward the most unsocial impulses in man." (Melvin Tumin)

Premise eight denies purpose and responsibility and is increasingly

TABLE 1

## OBSOLESCENT PREMISES TYPIFYING THE RECENT INDUSTRIAL ERA

- 1) *Individual identity* is to be equated with material possessions acquired and/or occupational status achieved.
- 2) *Mankind is separate from nature*, and hence it is our destiny to master nature.
- 3) *People are essentially separate*, so that little intrinsic responsibility is felt for the effect of present actions on remote individuals or future generations.
- 4) *Progress is synonymous with growth of GNP*, and quality of life is furthered by a system of economics based on ever-increasing consumption.
- 5) There is *freedom in affluence*; it is possible for people to earn "enough" money, and simultaneously have full freedom of choice.
- 6) Both societal growth and protection of one's own interests are best served by *competitive aggressive behaviours*.
- 7) The individual should be free to make his own choice of "the good", and the choices he makes in pursuit of *self-interest will somehow add up to the desirable overall societal choices*.
- 8) Any technology that can be developed, and any knowledge that can be applied, should be: "*technological imperative*".
- 9) *Economic efficiency* should be pursued indefinitely through the organization and division of labour and the replacement of humans by machines.
- 10) The search for knowledge is appropriately dominated by *utilitarian values* — science supported to the extent that it promises new manipulative technologies.
- 11) *Man is rational* and reductionism in positivistic scientific thinking is the approach to knowledge most to be trusted.
- 12) The aggregate knowledge of *specialized experts* constitutes wisdom.
- 13) The future of the planet can safely be left to autonomous *nation-states*, operating essentially independently.
- 14) "What ought to be" is not a meaningful concept because it is not achievable: "*political premise*"

Stamford Research Institute  
(From policy research report 4;  
slightly modified)

felt to belong to an immature stage of the individual as well as of the image society holds of itself (adolescence crisis.)

Premise nine is based on the view that economic behaviour is the real agent of history, man its subject; or in other words economics is not seen as a human enterprise to serve people, as a means of self-realization, but is seen instead as a blind force, whose laws have to be investigated and obeyed. Economic science has already for some time fulfilled the role that theology previously fulfilled and it is not surprising that, by analogy and reaction, emancipatory forces of a

new enlightenment are now emerging.

Premise ten is conflicting with social imperatives in that we are beginning to weigh the social, psychological and environmental costs against the utilitarian worth of new technologies. Premise eleven practically contends that we are first and foremost rational beings and that feeling should be subdued as an inferior aspect of our nature. This premise has facilitated the development of the cognitive skills required for the industrialization process. It is a view that relegates the world of art, music, poetry, and religion to a position of lesser

reality. Now the problem arises, how to give meaning to life in an affluent society if the "higher" pursuits of man must be subordinated to those that produce affluence. The dehumanizing influence in the suppression of man's non-rational potentials is increasingly realized.

Premise twelve rests on the tacit assumption that the whole is not more than the sum of its parts, a wrong assumption for all complex systems, in particular for living beings and for socio-political units. Its fallacy has been emphasized by the findings of modern systems theory.

The illusory nature of premise thirteen has come in to the open rather spectacularly by the emergence of global crises defying the cherished notions of national independence and authority (energy, ecology, inflation etc.)

Premise fourteen finally, the acknowledgement of moral nihilism, is perhaps the most pernicious one and the most difficult to check. Its refusal is more an act of ethical affirmation by living example than an intellectual exercise. Such examples have always existed; the question is whether they can become the rule rather than remain exceptions. The Janus head of the industrial society may be summarily illustrated by Table 11 juxtaposing "successes" and induced problems.

At this point we may restate the problem. The incongruence of (inferred) value premises and societal reality is critical, the underlying image of man shattered by conflictual contradictions. The question is, how congruence can be re-established in order to reverse tendencies to disintegration and to check the global threats. Somewhat simplifying, two different avenues seem to be open for achieving this purpose:

- sustain the dynamic of the industrial state and *adopt the image of human kind to fit that dynamic*, or
- limit the dynamic of the industrial state and achieve a transition towards a *qualitatively different post-industrial era* conforming to the guiding influence of a *newly emerging image of man*.

In either case the economic image of man needs change, only the



nature of such change would be quite different. For those who, like me, prefer the second solution, for reasons which may be akin to those advanced in the rebuttal of the "14 obsolescent premises", the point becomes: can we control the power of the industrial state (or rather cluster of states) with its intertwined interests and complicities of political institutions, economic enterprises and labour unions, and do we have emerging images of man on which to base the transition?

The powerful structuring influence of economic forces upon our societies produces standardized contexts of experience and creates an interlocking network of values, institutions, incentives, physical structures, and social structures that exact conformity as the price for inhabiting this societal environment. Moreover, the characteristics of the environment are of importance not only because they affect the comfort and quality of present-day life, but even more because they condition the development of young people and thereby of society (Inkeles, Dubos).

Although the imprinting force of this "machine" is strong, the industrial dynamic may be self-limiting if not self-defeating not only as it runs up against limits of resources and ecological supporting capacity, but also as it no longer provides people with a sense of identity and meaning; at the same time its structure reaches a point of increasing instability and vulnerability.

"The self-limiting character" to quote from SRI Policy Res. Rep. 4, (Table 3) "may already be reflected in our apparent need to make major modifications in our economic institutions. It might seem quite unrealistic to think of drastic change in the massive and powerful business organizations were it not for a historical parallel. Probably it would have seemed quite preposterous in the mid-eighteenth century to imagine that, over major portions of the globe, governments would soon be considered legitimate only if they derived 'their just powers from the consent of the governed', if they became 'governments of the people, by the people, and for the people'. The social

TABLE II

## SOME APPARENT SUCCESSES OF THE INDUSTRIAL ERA AND PROBLEMS INDUCED BY THEM

<i>"Successes"</i>	<i>Induced Problems</i>
Reducing infant and adult mortality rates	Regional overpopulation; problems of the aged.
Highly developed science and technology	Hazard of mass destruction through nuclear and biological weapons; vulnerability of specialization; threats to privacy and freedoms (e.g. surveillance technology, bio-engineering). Unanticipated consequences of technological applications; management breakdown as regards control of these; ecological crisis.
Efficient production systems; machine replacement of manual and routine labour.	Dehumanization of ordinary work; exacerbated unemployment.
Advances in communication and transportation	Increasing air, noise, and land pollution; information overload; vulnerability of a complex society to breakdown; disruption of human biological rhythms.
Affluence, material growth	Increased per capita consumption of energy and goods, leading to pollution and depletion of the earth's resources. Worldwide revolutions of rising expectations; rebellion against non-meaningful work.
Expanded wealth of highly industrialized countries; pockets of affluence	Increasing gap between "have" and "have-not" countries; frustration of the revolutions of rising expectations; exploitation; pockets of poverty.

(From SRI policy research report 4; slightly modified)

TABLE III

## FACTS POINTING TOWARDS A NEW IMAGE OF MAN

- Youth involvement in political processes and protests against societal wrongs
- Women's liberation movement
- Ethnic and subcultural consciousness movements
- Solidarity movements with Third World People
- Emerging interest in the social responsibility of business
- A "generation gap" more radical than ever, implying a changing paradigm
- An anti-technological bias of many young people, opposite to earlier tendencies
- Experimentation with new family structures and interpersonal relationships
- The emergence of communes as alternative life styles
- The conservation and ecology movement
- A surge of interest in Eastern religious and philosophical perspectives
- Renewed interest in "fundamentalist" Christianity
- Labour union concerns with the quality of the work environment
- Increasing interest in meditation and other spiritual disciplines
- Increasing importance of "self-realization" processes.

(From SRI policy research report 4; slightly modified)

power of granting or withholding legitimacy, though its mechanisms are subtle and little understood, has impressive force — as monarchies and colonial powers came to realize."

"An analogous challenge to legitimacy appears to be building up with respect to business institutions. The legitimacy which in the past was granted on the basis of ownership and managerial expertise is being attacked. Consumers, environmentalists, civil rights groups, and modern feminists are putting new requirements on business for social responsibility. Workers are demanding not only a voice in the policy making and decision processes hitherto reserved for management, but also improved work environments and 'meaningful work'. The emergence of huge multinational corporations with economic powers comparable to those of nations has brought awareness that these private-sector institutions have impacts on human lives comparable to the impacts of political governments, and hence should be subject to the demand made of governments to assume responsibility for the welfare of those over whom they wield power."

There are several reasons why we cannot expect to attain a viable post-industrial society with the institutional and regulatory means of our present system. One is the increase in specialization inherent in the development of expertise, narrowing the focus of regulating agencies as the need for global guidance increases with the increase of the consequences of new technologies. A second one is that the interdependent societal environment we have created is of such proportions that it defies direct control.

This leads us to the second basic question: that of emerging new images of man. A certain number of facts are visible which, individually, may be taken as disparate symptoms of unrest without greater meaning, which suggest, however, when considered together, the eventual emergence of a new, guiding and anticipatory image of mankind.

What can be distilled from these facts and the still vague imagery behind them, seems to be an emphasis on co-operation over com-

petition, on ecological co-evolution over exploitation and on spiritual growth over material acquisition, with an integration of intuitive holistic knowledge processes with the merely rational modes. The profound contrast between these ways of living and the essence of the prevailing system makes it understandable that the latter sees the manifestations of the former as a threat. Signs of impending disintegration of a society can only be acknowledged as symptoms of a healthy process if the outline of the new pattern can be understood and is welcomed in the final analysis. A tentative sketch of such a possible pattern is presented in Table IV.

of a person's value system is so unyielding to change as his sense of identity (which often is an Ersatz identity).

Resistance and evasion of the very knowledge most needed to resolve the problems is a well-known phenomenon in psychotherapy. "The reason contemporary societal problems appear so perplexing may well be not so much their essential abstruseness and complexity as the collective resistance to perceiving the problems in a different way." (SRI). Massive denials of reality occur already (e.g. concerning the economic and ecological crisis, population increase, energy use, etc.) and the analogues of indi-

#### TENTATIVE PROPERTY PATTERN OF A POST-INDUSTRIAL SOCIETY WITH A NEW IMAGE OF MAN

- 1) Better existential balance of man between dimensions such as empirical/intuitive, manipulative/interactive, rational/intuitive, utilitarian/aesthetic.
- 2) Stabilizing population; decentralization of urban areas; greater diversity of living environments to permit many life-style alternatives.
- 3) Increasing affluence turning toward a steady state society without substantial income/wealth differentials; appropriate ("do more with less") technologies; more creative/participative leisure activities.
- 4) Decrease in the use of social, economic, political and behaviour engineering, except where chosen by a societal subgroup as its preferable mode of organizing and directing life-activities.
- 5) Reliance upon specialized and general (holistic) skills of "knowledge elites" with greater legitimization (as opposed to power elites) and use of divergent thinking; greater participation in the planning processes.
- 6) Continued accumulation of scientific and technical knowledge but of a sort which fits within the framework of a new "moral" paradigm.
- 7) Decentralization and deconcentration of economic and political power to allow full valued participation of people in their political and productive process.

(From SRI policy research report 4;  
slightly modified)

The new image (which some have called "evolutionary transformationalist") is clearly irreconcilable with the old one ("technological extrapolationist"), not so much in being its opposite but rather in containing many opposite elements in a higher level synthesis. As its main feature is *responsiveness* to the exigencies of all partners in our interdependent world system (including "nature" of which we are a part) I prefer the term "responsible partner" to the heavy word "evolutionary transformationalist"; by analogy, and given the reckless shut-up mentality of the other image, the latter may be called the "irresponsible technocrat" or "superman" image. It may be said at this point that resistance to both the new image and its implications is coming not only from interest clashes and defence of privileges but from a deep-rooted psychological mechanism. No aspect

vidual irrational behaviour on the societal level become more and more spectacular (social disruptions, violent crime, epidemic dope and alcohol addiction, appearance of bizarre pseudo-religions cults and superstitious practices in the midst of a rationality-proud society).

One conclusion of the preceding is the danger that the increasing exacerbation of ecological, alienational and politico-economical problems by measures of short-term expediency will bring demands for drastic solutions to ensure stability and survival, leading to a kind of society which Bertram Gross has called "friendly fascism":

"... a new form of garrison state, or totalitarianism, built by older elites to resolve the growing conflicts of post-industrialism. More specifically: a managed society which rules by a faceless and widely dispersed complex of warfare-welfare-industrial-communications-



police bureaucracies caught up in developing a new-style empire based on a technocratic ideology, a culture of alienation, multiple scapegoats, and competing control networks . . . Pluralistic in nature, techno-urban fascism would need no charismatic dictator, no one-party rule, no mass fascist party, no glorification of the state, no dissolution of legislatures, no discontinuation of elections, no distrust of reason . . . this style of management and planning would not be limited to the economy; it would deal with the political, social, cultural, and technological aspects of society as well . . . The key theme, therefore, would not be the managed economy, but rather, the managed society."

(B. Gross, 1970)

There are already signs of the emergence of key elements of this scenario, and the vicious circles:

- dissent, repression, more dissent, more repression . . .
- complexity breakdown, engineered solution, more complexity breakdown, more engineered solutions . . .
- fear, surveillance, more fear, more surveillance . . .

(D. Cahoon)

are unfortunately not limited to particular political systems.

On the other hand it is not so impractical and naive as one might think that for instance powerful administrations and superpowerful multinational corporations yield to humanizing change. "The social force that might bring about such a revolutionary change in operative goals is the subtle but powerful (and poorly understood) influence of granting or withholding legitimacy. Governments have often felt the potency of legitimacy withdrawal. Giant corporations today are feeling the challenge put to the divine right of kings two centuries ago. It assumes many forms — movements of consumers and environmentalists; civil rights and women's liberation; truth-in-advertising pressures; worker demands for improved quality of work environment; stockholder revolts. Awareness is growing that the largest corporations, at least, are in an important sense public institutions. Directly or indirectly (through

life insurance policies, annuities, mutual funds, etc.) they are owned by a large number of the public and employ a large portion of the people; the public uses the goods and services they produce, and suffers the environmental degradation they produce. The wave of public challenge is forming." (SRI) As to institutions (bureaucratic, educational, legal, transportation, banking, medical, etc.) many of them appear to have surpassed a critical size beyond which their control becomes ineffective. As Richard Bellmann said in a systems theory lecture:

"I think it's beginning to be realized that our systems are falling apart. We don't know how to administer them. We don't know how to control them. And it isn't at all obvious that we can control a large system in such a way that it remains stable. It may very well be that there is a critical mass — that when a system gets too large, it just gets automatically unstable."

Paradoxically enough, it seems that reshaping and restructuring society according to the new image of the "responsible partner", that involvement of the concerned, that decentralization and de-concentration would not only reduce the feelings of anxiousness and superfluousness of the individual, but also permit better management and government, impose fewer external constraints on enterprise and individual liberties.

Some of these elements of thought can already be found in the writings and utterings of prominent politicians, although we should not forget that they are as much (if not more) built-in to the present system as the average citizen. Their margin of decision is small and the breaking out of the general vicious circle is possible only as a joint effort, at all levels, of a non-elitist elite.

Let me quote here just a few lines from the Tindemans Report:

- "For me, the conclusion is obvious: If we wish to safeguard the achievements of the Treaties and conquer new ground the Member States must agree on new aims."
- "Our peoples are concerned with new problems and values scarcely

mentioned by the Treaties."

- "We must listen to our people. What do the Europeans want? What do they expect from a united Europe?"
- "We all feel that our society is in the state of anxious expectancy and conflict which is the forerunner of major changes. New and sometimes contradictory scales of values are making their appearance in all fields of social life. The task of the present generation is to seek a transition to a post-industrial society which respects the basic values of our civilization and reconciles the rights of the individual with those of the community. If we fail our democracies will be at risk and our children will inherit a decadent society."
- "A new type of economic growth displaying more respect for the quality of life and the physical and human environment and better able to reconcile economic and social objectives."
- "Finally, the development of individual personal responsibility in the social and economic sphere by associating workers with the decision making, the management or profits of undertakings, by greater freedom in the organization of work, by more openness, decentralization and consultation in public administration."
- "We will then have created a new type of society, a more democratic European with a greater sense of solidarity and humanity."
- "No one wants to see a technocratic Europe."
- "... the national governments' hold over the means that make it possible to influence the future of our societies has constantly diminished. Both internally and externally, the room for manoeuvre of the individual States has decreased. They attempt to maintain their balance in the face of pressures and factors, internal as well as external, which are outside their control. The danger of the effects of this two-fold spiral of impotence is great; it leads from weakness to dependence, which itself is a source of further losses."

During one of the sessions held on the Tindemans Report at the French

Senate, a prominent anthropologist, Jacques Robin, beautifully expressed some of the deeper points of the problem of the European Union. the following is a free translation of part of his talk.

"Some of those who are gathered here tonight perceive more or less clearly that the reconstruction of Europe could serve as a privileged scene where a new society would arise involving itself in the creation of a society of planetary dimensions, pluralist and open to new ideas for the future of the species."

"But the reconstruction of Europe cannot be played in 1976 with the same cards that were distributed twenty years ago."

"... It is now quite evident that the reconstruction of Europe has but

one chance of going forward: to *define the goals of a different society* which would articulate the still vague wishes of public opinion; it is to be feared that the Tindemans Report, however clever and intelligent it may be, will stand little chance of rallying the social forces of the manual or intellectual workers, of the young or of the scientists hoping to find in the European reconstruction the testing ground for a new type of life."

"In this almost desperate situation however, one opening becomes increasingly perceptible: in the recent findings accumulating in biology, psychology, sociology, economy, in short in the field of the phenomena of the 'living', there is a perspective which one might call

"bio-anthropological", capable of achieving the goals best adapted to the desires of European populations ..."

"... It is the possibility of increasing complexity that directs the evolution of living societies. Can we not hope therefore, that the reconstruction of Europe, if it learns how to profit from the diversity of its societies, by the cross pollination of ideas and through the lowering of the barriers between its peoples, can in the last quarter of the twentieth century, show itself to be offering a rare chance for all humanity?"

Finally a quote from a recent book by the German politician Erhard Eppler:

"He who wants to do only those things for which consciousness already exists, narrows his margin of action in such a hopeless way that he cannot any more do the necessary."

It is evident that the analyses very sketchily presented here and the imperatives deduced from them cannot but permit a highly critical view of the policies pursued by the governments of the Member Countries and by the European Commission, whether they concern economy, energy or, not the least, research and development. It is, to be sure, not the objective of this paper to indulge in detailed criticism or to present counterproposals, but to give at least some food for positive thought and discussion, a list of theses is given as Table V concerning research and development in harmony with the "new" image of man.

The above is an edited version of a paper given at the Symposium held in Brussels from 4-6 October, 1976 by the *Foundation Internationales des Sciences humaines*.

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TABLE V

## THESES CONCERNING R&D IN HARMONY WITH THE "RESPONSIBLE PARTNER" IMAGE OF MAN

- "The amok run of 'research at all costs' in its present form worsens the 'madhouse of the universe' which our planet is already. In comparison with the extreme perfection which modern science has developed for the *discovering* of knowledge, the sphere of processing and *valorization* of the available information is still in the 'hunter/gatherer economy' age; this is particularly true for the humanities. (Siegfried Reisch)
- "One produces [knowledge] for production's sake instead of caring for its *use*, i.e. for the necessary ideas, which man today *needs* and *can process*." (Ortega y Gasset)
- The high degree of global interdependence of our world system has reached not only in terms of geography and of the natural environment, but also of human activity sectors and "vertical" societal dimensions, asks for the development of *holistic and systemic* knowledge tools rather than dissociative and analytical ones. In the absence of a global, integrative, synoptic and dynamic view of "World", the whole is *less* than the sum of its parts, due to confusion, incoherence, and apparent incompatibility.
- The knowledge of *self-organisation* (and self-destruction) of complex *open systems* should become the privileged subject of research. ("Human society is the most complex of all living systems on our planet and scientific knowledge has barely scratched at the surface of this complex whole" says Konrad Lorenz.)
- The preferred way of looking at the problems of today should become the view *from the future* rather than the usual retrospective analysis.
- Instead of the "central perspective", discovery of the Renaissance, i.e. the egocentric or group- (class-, nation-, ...) centred perspective, a *global or cosmic perspective* is needed, prerequisite of a New Renaissance.



# VIEW FROM <sup>THE</sup> Ecology Party



## Through Cess-pool to Bright Horizon

We are all familiar with the standard Growthmaniac response to conservationist worries, which runs along the lines: "Man has always managed in the past; somebody will think of something again now" — A fine example of this is a B.N.F.L. Executive who, on B.B.C. radio, referred to the provision of gasmasks for British civilians at the beginning of World War 2 as evidence for man's foresight and cleverness. Anyone who can see cause for hope in the last world war must surely be wearing rose coloured spectacles and blinkers as a cure for myopia.

And yet these are the people who run and plan our lives.

And what answers does the conservation movement produce to blundering optimistic growth-lust? We produce wonderful reasoned arguments and endless crucial statistics. We tell the story of the lily-pond so that non-mathematicians may grasp the meaning of exponential as opposed to arithmetic growth. We explain as clearly and reasonably as we can how our various figures and resource depletion dates are arrived at.

We might as well try to explain the theory of relativity to a cretin.

Unfortunately it is not reason which guides our actions — it is not reason which makes us get married or make love, not reason which makes us go on holiday or go to war. It is not reason which makes us drive at high speeds through fog, pump D.D.T. into the environment, or spray graffiti on walls with aerosol paints. If we are to create a society which does not risk its birthright for a mess of Japanese hi-fi equipment we need more than right on our side; we need might as well.

Unfortunately there is something about a conservationist which abhors the acquisition or prosession of power. Those of us who would be gentle with our planet are also likely to be gentle with each other, to live and let live. This leads most of us to continue with our rational treatises while the world's oil burns.

The Ecology Party section in the last issue of the Ecologist stressed the need for compromise within any political party which is to be successful. For many of us the very first compromise we must make is the one between our ideals of the way government *should* work, and the way it *really* works, which is rather like a raffle in which papers are dropped into a box instead of one being taken out. The winner takes all in both cases.

The confusing factor for many is the constant public argument which goes on between parties, giving the impression that they might convince each other of the rightness of their ideas. In fact all this banter, often riddled with casuistry, is directed mainly towards the relatively small percentage of voters who have no party loyalty and little sound or independent judgement on which to base their voting. This is a large part of what makes politics so mucky — the grubbing for the few extra votes that can put someone in a position where might substitutes any need to be right.

If we, as conservationists, wish to achieve our goals this is the ball-game we have to enter: standing on the sidelines cheering and booing, however much it makes us feel better, will not affect the result. We do not, however, have to become as dishonest as some of our adversaries. When they promise the electorate the Earth we can tell them that we are forced to share it with 4,000,000,000 others. We don't expect shouts of joy from people who are being told that they face a lower standard of living, but there will be many who will weep tears of joy and confusion on meeting an honest politician, one who tells them the truth rather than the fairy tale they might like to be told.

People with beautiful rose gardens often have hands cut by thorns and may smell of manure. There's a price for everything. We in the Ecology Party think that paddling in the political cess-pool is a tiny price to pay for the chance of building a sustainable democracy which may bring security to our descendants for thousands of years.

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Full membership at £4 per year covers newsletter, plus "Good Earth" plus voting rights. Associate membership covers newsletter only at £2. Joint full membership is £6. Cheques/P.O.'s should be made payable to the Ecology Party.

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# DEINDUSTRIALISING SOCIETY

The Ecological Movement is committed to the development of an economically and politically de-centralised post-industrial society, how is it to be achieved? A plan was sketched out in *A Blueprint for Survival*. The problem is re-examined five years later by one of its co-authors.

1. It seems unnecessary to list the ills our world is suffering from or to demonstrate that they are getting worse, or that the measures undertaken by us to combat them are increasingly ineffective. It is important, however, to determine why all this should be so.

2. The tendency, of course, is to blame our failure on mere technicalities, errors in the implementation of our policies, *not on the policies themselves*, for these are the only ones consistent with our world-view, hence the only ones the society it gives rise to, is capable of providing.

3. Let us begin by considering the main features of this world-view. Implicit to it is the notion that the world we live in is *imperfect*. In the middle ages, the Cathars and other heretical sects also regarded the world as imperfect. Their reaction, however, was to cut themselves off from it, and live instead in a spiritual world of their own making. We, on the other hand, have set out *systematically to improve it*. By means of science, technology, and industry, we have persuaded ourselves, it can be transformed into a veritable paradise, in which everyone will have at his disposal an extraordinary

array of consumer goods and ingenious technological devices, and in which vast specialised institutions will deal so 'scientifically' with all such problems as unemployment, homelessness, ignorance, crime and delinquency, which are supposed to have afflicted us since the beginning of time, that they will be eliminated once and for all.

4. This transformation is referred to misleadingly as development and the direction it is leading us in is referred to as progress. It is thereby not surprising that any problems which arise are ascribed to under-development, and that, to solve them, it suffices to invest in more scientific research, more technological development and more industrial expansion, i.e. in 'more development, to which — needless to say — our society is, in any case, committed.

5. In other words, rather than interpret our problems *objectively* (which is what science is supposed to do for us), we have interpreted them *subjectively* so as to make them appear amenable to the only solutions that can be provided by us without radically altering our world-view and the social behaviour

pattern it gives rise to — the only solutions which, among other things, are at present *economically viable* and *politically expedient*.

7. Thus, for instance, we define poverty as a shortage of material goods, which justifies the production of more and more material goods. It does not occur to us that it might be more realistic to regard it as an *aberrant situation in which more material goods are required than can actually be produced*, for then the solution would be to create those socio-economic conditions in which less goods rather than more were required.

8. Or again, we interpret the housing problem as a shortage of houses, which justifies the building of more and more houses. It does not occur to us that it might be more realistic to regard it as an aberrant situation largely caused by the disintegration of the family, as a result of which, where there were eight to ten people per house, there are now two or three. This latter interpretation would be inconvenient, since though we know how to build houses, industrial society does not provide the means for restoring the integrity of the



by Edward Goldsmith



family unit.

9. In the same way, we regard the high crime rate as but a sign that the police force is inadequate or that it is not sufficiently well equipped. It does not occur to us that it might be but a symptom of social disintegration. This is because, though it has been up to now, reasonably easy to engage more policemen, build more prisons, and manufacture more armoured cars and burglar alarms (the U.S. spends about twenty billion dollars a year in this way), there is no mechanism available to us for creating a sounder society without compromising the achievement of other goals to which we attribute a higher priority.

10. If our interpretation of these and all the other problems which face our society today was the correct one, then on logistical grounds alone one could state unhesitatingly, *that they could never be solved*, and that the future of man was very grim indeed. Fortunately, our interpretation is wrong. Our problems are of a very different order and the correspondingly different solutions are much easier to apply. It is the aim of this paper to provide a more realistic interpretation of our

problems and try to determine the best strategies and tactics for solving them.

11. Let us look a little more closely, at this process of 'development', or more precisely 'industrialisation' — its latest phase. Firstly, it is autonomous. It does not occur in a vacuum as is implied by modern economics. If the world were a lifeless waste as is the moon, there could be no industrialisation. If it has occurred at all, it is that over the last few thousand million years the *primaevae* dust has slowly been organised into an increasingly complex organisation of matter — the biosphere, or world of living things — or the 'real world' as we might refer to it — which provides the resources entering into this process. Industrialisation is something which is happening to the biosphere. *It is the biosphere, in fact — the real world — that is being industrialised.*

12. In this way, a new organisation of matter is building up: the technosphere or world of material goods and technological devices: or the *surrogate world*.

13. This brings us to the second important feature of industrial-

isation: the surrogate world it gives rise to is in direct competition with the real world, since it can only be built up by making use of *resources extracted from the latter*, and at the same time by *consigning to it the waste products it must inevitably generate.*

Let us see why this must be so:

14. The actual building up of the surrogate world occurs in three steps: *Firstly*, resources are extracted from the real world, which can only lead to its contraction and deterioration. Thus, to obtain timber forests must be felled, causing soil erosion, a fall in the water table, the drying up of streams and increasing the incidence and severity of droughts and floods. To obtain other building materials such as stones, or clay for brick making, still more areas must be deprived of their trees and topsoil.

15. *Secondly*, so as to build up the surrogate world of cities, factories, motorways and airports, these materials must be organised differently *elsewhere*. Hence, the land must also be deprived of its trees and its topsoil before being covered with materials such as cement and asphalt which are random to the





processes of the real world.

16. *Thirdly*, by virtue of the first law of thermodynamics, this process, like all others, must give rise to waste products. These become increasingly toxic as industrialisation proceeds (as synthetics take over from naturally-occurring materials). Unfortunately the processes of the surrogate world, being far more rudimentary than those of the real world, give rise to correspondingly more wastes, and as they are neither arranged in such a way, nor are they of the right sort to serve as the necessary raw materials for the further development of the surrogate world *let alone for the restoration of the real one*, they simply tend to accumulate as 'randomness' or entropy vis-a-vis, both of these rival organisations of matter.\*

17. To illustrate this point, consider a modern city of a million inhabitants. Wolman has likened it to some vast beast with a very specific metabolism. Every day it must take in some 9,500 tons of fossil fuels, 2,000 tons of food, 625,000 tons of water, 31,500 tons of oxygen plus unknown quantities of various minerals while it must also emit, during the same period, some 28,500 tons of CO<sub>2</sub>, 12,000 tons of H<sub>2</sub>O (produced in the combustion of fossil fuels) 150 tons of particles, 500,000 tons of sewage, together with vast quantities of refuse, sulphur and nitrogen oxides and various other heterogeneous materials.

18. If the beast is to keep functioning, its metabolism cannot be stopped any more than that of any other beast. This means that the resources must be extracted from somewhere, the wastes released somewhere else. The latter by virtue of the first law of thermodynamics cannot simply be made to vanish. Pollution-control simply consists in diverting them to where they are likely to do the least harm or to dilute them in the atmosphere or in the seas. (The loss during the recycling process, in the case of most materials, is so great that this does

not provide any long term solution). Pollution-control, in fact, is only possible when there are few such beasts around, impossible when there are a large number — for then pollution becomes global rather than local. There is nowhere to divert it to, and nothing left to dilute it in.

19. It must follow that all three steps involved in the process of building up the surrogate world give rise to a corresponding contraction and deterioration of the real one. Economic growth, in terms of which the former process is measured, is thereby biological and social contraction and deterioration. *They are just different sides of the same coin.*

20. Unfortunately, we are part of the real world not the surrogate one. In fact, we have been designed phylogenetically, (and at one time culturally, too) to fulfil within it specific differentiated functions. It would be very naive to suppose that its systematic destruction would not affect us in some way. To understand exactly how, we must consider the basic features of the real world. Unfortunately, these tend to be disregarded by most of today's scientists, who are more concerned with accumulating trivia than in understanding basic principles.

21. The most basic principle of the behaviour of the biosphere, is that it is goal-directed as can be shown to be the case with all the behavioural systems which comprise it. The goal is stability. Stability is defined as the ability of a system to maintain its basic structure in the face of change — and hence its continuity, or, in the widest sense of the term to survive. It is not a fixed point in space-time but a course or trajectory which a system must adopt in order to remain stable. By doing so, oscillations or discontinuities are reduced to a minimum. It can be shown that primitive societies were geared to precisely this goal. The main pre-occupation of their members was to observe their traditional customs, and to hand them down as intact as possible to their children, and to their children's children. It is only a very aberrant society such as ours, that is geared to systematic change in a given direction, and one that can survive for but a limited period of time.

22. The second aspect of the biosphere which concerns us here, is that it is self regulating, as are all the systems which constitute it. Control is achieved by detecting data relevant to the system's behaviour pattern, and interpreting them in terms of a model of its relationship with its environment. This, in the case of a society, corresponds to its 'world-view', in terms of which its policies are mediated and monitored. This notion of self-regulation is so important to the achievement of stability, that the two are normally included in the same concept of 'homeostasis'. If self regulation is impaired and the system comes to be controlled externally (asystemically) by an agent outside the system and random to it, then there is no longer any mechanism for keeping it on its course towards stability. Self-regulation was indeed a basic feature of primitive societies which were in fact remarkably well governed by public opinion and without the aid of formal institutions. Ours, on the other hand, are increasingly governed by external or asystemic agencies, dictators or vast bureaucracies, which are not subjected to the control of the social-system as a whole, for the latter has largely disintegrated into a structureless mass which no longer satisfies the requirements of a self-regulating system.

23. A further consequence of replacing systemic controls by asystemic ones, is that the normal relationship between a system and its sub-systems is interfered with. In the case of a social system this gives rise to *motivational problems*. We shall make this clear.

24. A self-regulating system displays 'order' or 'negative entropy'. This means that its parts are differentiated to fulfil specialised functions. They are thereby no longer autonomous. Instead they have become dependent on each other to fulfil that constellation of functions required for their common survival. In other words, they must co-operate with each other and behave in that way that will satisfy the requirements of the system of which they are a part, and hence contribute to the latter's stability or survival. This they do, not because pressure is applied upon them to do so, by some external

\*Footnote:

The essential difference between these two applications of the word entropy seems to have been generally disregarded.

agent, but because they have been designed phylogenetically and ontogenetically to fulfil the requisite differentiated functions. It is by fulfilling them, in fact, that their relationship with the various constituents of their environment is the most stable — that they are thereby best adjusted to their environment — that their needs are in fact best satisfied.

25. The operation of this principle at the level of the family is quite evident. A mother fulfils her normal functions by behaving in a particular way towards her husband and children and thereby ensuring the survival of the family, because *it is by so doing that she best satisfies her basic physical and psychological needs*. It will be shown that the same principle applies to behaviour within any self-regulating system such as a community or an eco-system. I refer to this as the Hierarchical Co-operation Principle which could be stated thus: *in a self-regulating system, behaviour which satisfies the needs of the parts will also satisfy those of the whole*.

26. It no longer applies in a modern industrial society, in which behaviour either satisfies, however badly, the needs of the part or of the whole but never both at once. Hence, Garrett Hardin's famous allegory: 'The Tragedy of the Commons', which simply could not occur in a self-regulating social system.

27. The reason, of course, is that once a system has disintegrated, it ceases to provide the sub-systems with the optimum environment, that in which they can fulfil adaptively the functions they were designed for by their evolution and their upbringing. Once the environment fails to satisfy the needs of its members, they will cease to behave in that way which will lead to the stability of the larger system of which they are a part, or what is the same thing, of the environment it provides them with.

28. In a disintegrated society it is thus very difficult to obtain the co-operation of its members for any enterprise which is not specifically designed to satisfy individual interests which — because of the society's disintegration — now conflicts with those of the society as a whole. We are now, in fact, faced with a *motivation problem* which

could not exist in a tribal society which constitutes a self-regulating system. Their co-operation can only be obtained by offering a financial reward or, if the enterprise in question appears to be too contrary to their immediate interests, by coercion.

29. In other words, when a natural system ceases to be self-regulating, its behaviour is no longer based on the exploitation of existing social forces. To ensure its day to day functioning, and hence its survival — in the broader sense of the term it must exploit forces which are external and random to the system (asystemic) — and this causes serious problems.

30. First of all, to do so presents serious logistical problems, for the work involved increases correspondingly. Thus, as we take over an increasing number of functions from the self-regulating mechanisms of nature, such as the control of pests, the fertilisation of the soil, the management of water resources and the government of human societies, *our work load increases correspondingly*.

31. We assume, that if it is technically possible to go on taking over such functions, then we can do so. This is simply not true. *There is a limit to the workload we can undertake*. Indeed, the signs are that we are already overstretched and that neither available capital, nor physical resources — to mention but two factors involved, can allow us to take over any more of the functions that are still fulfilled by nature's self-regulating mechanisms. As pointed out in the SCEP report were we to decide that the pollination of plants by bumble bees was old-fashioned and inefficient and that it would be advantageous for us to assume this function, even were we to have at our disposal the most ingenious technological devices, we could not do so for more than an insignificant period, *for the logistical problems involved would be insuperable*.

32. To fully understand the extent of these logistical problems, we must consider just how rudimentary are our asystemic controls, when compared with the systemic ones of nature. As already pointed out, the biosphere, or real world, is an organisation. The importance of this

notion of organisation cannot be over emphasised. Consider that a human being is made up of but a small and very unimpressive array of raw materials. He is 80 per cent water and the market value of the chemicals used in his production is not much in excess of one pound. However, 3,000 million years of evolutionary research and development have gone into organising them in such a way that they give rise, for better or worse, to so miraculous a thing as a human being. Now consider how unimpressive would be the most sophisticated human artifact which could be produced from the same materials.

33. It must follow that when one has at one's disposal a limited quantity of materials — which must be the case at the best of times, since our world is a closed system from the point of view of materials — (though an open one from the point of view of energy) it is incomparably *more efficient to use them in such a way that they enter into the building up of the real world rather than the surrogate one — and hence that they give rise to systemic rather than asystemic processes*.

### The Problem Multiplier

34. We have seen that in a self-regulating system, behaviour satisfies both the needs of the part and of the whole — in other words, it satisfies the needs of all the separate inter-related parts of the system. We have seen that this is no longer the case once a system has disintegrated. Responses are designed to satisfy a single need only. Such responses, must nevertheless affect in one way or another, the other different parts of a system. As Garrett Hardin puts it, 'You can't do only one thing', and since the things we are doing are random at best, damaging too at worst, to the other parts of the system, they must cause a corresponding number of maladjustments. *Asystemic processes and controls, thereby, have side effects. Systemic ones do not*. All secondary effects are useful, indeed necessary. *The former, in fact, are problem multipliers, the latter, solution multipliers*.

35. What is more, the maladjustments they all give rise to will tend to be cumulative, for as further



asystemic controls are introduced, so must the surrogate world build up correspondingly, which in turn must cause our environment (made up of the shrinking real world and the growing surrogate world) to divert ever more radically from that to which we have been adapted phylogenetically and ontogenetically, and which must thereby constitute our optimum environment. Boyden considers that the so-called diseases of civilization: cancer, ischaemic heart disease, diabetes, appendicitis, diverticulitis, varicose veins and tooth-caries, whose incidence appears to increase with per capita GNP, i.e. with the extent to which our environment has diverted from the optimum, are but the symptoms of phylogenetic and hence biological maladjustment.

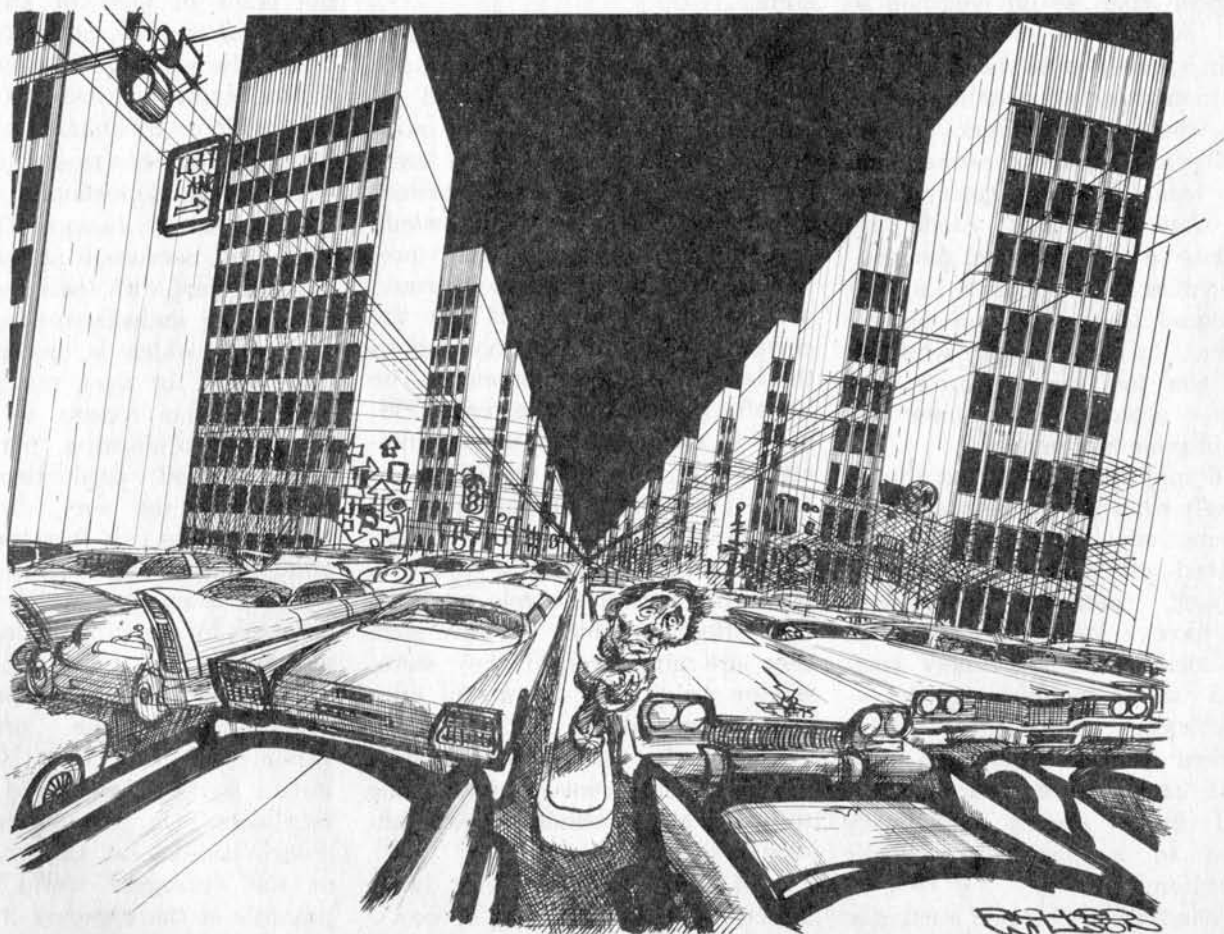
36. It is also realistic to regard social problems whose incidence is becoming increasingly intolerable, such as crime, delinquency, alcoholism, drug addiction, vandalism, as the symptoms of social maladjustment, caused by the disintegration of our social environment and the modification of its physical infrastructure, so that they divert ever

further from the optimum — that to which we have been adapted phylogenetically, and are capable of adapting to ontogenetically.

37. It is also realistic to regard the increased rate of extinction of plant and animal species as the symptoms of ecological maladjustment. The corollary of this: the increased incidence and seriousness of population explosions among micro-organisms, leading to plant and animal epidemics (some of which are resulting in their extinction), and among plants and animals, in particular *Homo-Rapiens* and his parasites also fall within this category, all are due to the increasing diversion of ecosystems from the phylogenetic norm, as a result of the ever increasing impact on them of the surrogate world.

38. Those inculcated with the world view of industrialism, will object that in the case of *Homo-Rapiens*, such maladjustments are not conceivable by virtue of his supposed limitless capacity for adaptation. As Boyden points out, however, we only cherish this illusion because the term

'adaptation' has never been adequately defined. Systemic processes are adaptive because they actually solve problems. Asystemic ones, in which category we must include the solutions we apply in our industrial society, can only 'solve' one problem at the cost of creating more, and increasingly worse ones at that. Quite apart from the fact that they do not work, as is evidenced by the fact that everywhere our problems are increasing, the capital and resources required in their application are ever less available. Boyden refers to them as pseudo-adaptations. They treat the symptoms, not the causes, and by masking them render the disease correspondingly more tolerable, thereby serving to perpetuate it. This is particularly the case with our State welfare system. In reality, if the term 'adaptability' be used correctly, then it is clear that man is no more adaptive than are other animals. In fact, he is considerably less adaptive than many micro-organisms — that is why waging chemical warfare against them should do more biological damage to us than to the target species.



## The Solution

39. From the preceeding analysis it should be clear that the problems facing the world today can only be solved by restoring the functioning of those natural systems which once satisfied our needs, i.e. by fully exploiting those incomparable resources which are individual people, families, communities and eco-systems, which together make up the biosphere or real world. Before we examine how this is to be done, let us first of all look into one or two of the many implications.

40. Clearly, this involves as it must do, moving towards a stable or steady-state society. This, however has generally been associated with a stationary economy. However, though a society in which capital investment equalled depreciation, and births equalled deaths would be one of material equilibrium, it would not be a steady state society. The impact of man's activities on natural systems — or ecological demand, as it is referred to by SCEP and in terms of which biological, social and ecological costs can be calculated, is *cumulative* (that is over and above the rate of natural recovery). This means that biological, social and ecological costs would continue to rise.

41. In a steady-state society capital investment would equal depreciation, births would equal deaths, *but the actual level of capital investment and births would be very considerably lower than at present* — one that gave rise to an 'ecological demand' which could in fact be met, i.e. that was equal to the rate of natural recovery. In other words, what we must aim for is not growth, but *negative growth, or economic and demographic contraction*.

42. It may be argued that this is precisely what we are getting at the moment, now the oil crisis has triggered off a world recession. Economic contraction, however, must have a very different effect in a society still effectually committed to economic growth — methodically nurturing those appetites whose satisfaction only growth can procure, from what it would in a society specifically geared to a planned economic contraction.

43. The former situation must give rise to an ever greater dis-

equilibrium, the latter by adapting to inevitable realities, means systematically reducing it.

44. One of the main barriers to the acceptance of such a programme is that economic contraction is viewed as synonymous with a reduction in 'wealth' and hence, in the 'standard of living'. If we believe this, it is once again because these terms have been so misleadingly defined. They are used as a measure of the benefits provided by the surrogate world, *but not by the real world*.

45. In our society the value of things is determined by the operation of the Law of Supply and Demand. Things only acquire value by being drawn into the economic system, and then by becoming scarce, for value in Economics is *marginal, not average, value*. "The more there is of a commodity", writes Samuelson on this subject, "the less the relative desirability of its last little unit becomes, even though its total usefulness always grows as we get more of the commodity. So, it is obvious why a large amount of water has a low price. Or why air is actually a free good despite its vast usefulness. The many units pull down the value of all units."

46. What is more, the contention by many economists that such "externalities" as clean air and uncontaminated water can be internalised, i.e. that they can be taken into account within the framework of modern economic theory would only be true if their real value were, in fact, quantifiable in money terms.

47. Money, however, is not the currency of nature, nor does it obey the laws of modern economics. The benefits provided by the real world, such as clean air and uncontaminated water, are not obtainable as we feel they are in proportion to the amount of money spent on them. Money would only buy them if our technological controls were, in fact, effective, which we have seen they are not. Even if they were, money would only be useful once these commodities had been so depleted that they had thereby acquired a sufficient economic value to justify any considerable expenditure on them.

48. If our notion of 'wealth' is so inaccurate, so is our notion of 'cost'. Only immediate monetary costs are

taken into account by our economists. Damage done to societies and ecosystems is not taken into account. Yet these must at some later date become reflected in monetary costs — which explains in large measure the powerful inflationary trends of today.

49. It is both ironic and frightening to think of the number of critical decisions taken today on the basis of cost-benefit analyses established by people who neither know what is a real 'cost' or what is a real 'benefit'.

50. In terms of real costs and benefits, those of the real world rather than of the surrogate one, it can be shown that our policy is the only one, that can systematically increase our standard of living.

## Population and Consumption

51. It is maintained by some that because of our vast population, it is impractical to dispense with the industrial system. How would we feed so many people without industry, it is asked? This notion stems, partly at least, from the error of regarding food availability from the point of view of an *isolated industrial country*, rather than from that of the *world as a whole*. An industrial country has so far been able to provide its inhabitants with more food than has been available to those of the so-called developing countries — *not, however, because it produced more*, but because it persuaded the latter to part with their food in exchange for manufactured goods — a process which is unlikely to be practicable for very much longer. There is no reason to suppose that industrialisation permits increased food production except perhaps in the very short term, for the inputs that it renders available, apart from causing environmental damage which largely accounts for the diminishing returns encountered in their use, are in limited supply, and their price must eventually become prohibitive. Already, no more than 10-15% of Indian farmers can afford artificial fertilisers. On the contrary, industrialisation, i.e. the building up of the surrogate world, is only possible at the expense of the real one *from which our food is derived*.



The diversion from it of land, timber, water (which is particularly significant in tropical countries where it is often the limiting factor on food production) and, of course, labour (in particular in industrial countries), is seriously reducing food production, as has been shown in particular by Borgstrom.

52. Seen in these terms, it must follow that the number of people the real world, taken as a whole, can support is inversely proportionate to its level of industrialisation. In fact, it is partly because of our massive population, rather than in spite of it, that de-industrialisation is our only possible course of action.

### The Individual as a Resource

53. During the industrial age it has become one of the principal preoccupations to use human labour as sparingly as possible, partly because it has become so expensive while other factors of production have been unrealistically cheap, partly too because we have come to value leisure, or non-work very highly, and to provide it has become one of the most generally accepted means of increasing a people's well-being.

54. Leisure, however, is only prized in those societies which share our notion of 'work' as distinct from other normal day-to-day activities. This notion does not exist in traditional societies, in which economic activities are carried out on a scale which makes them appear relevant to the business of everyday living. This tends to be confirmed by the fact that there is no word for 'work' in the language of tribal peoples.

55. It is important to note that our massive population provides us with a very considerable amount of non-polluting energy at no cost save in terms of the calories contained in the food which it would, in any case, probably consume. The principle that people must be made to work again with their hands and not just press buttons and pull levers, has considerable implications. Let us not forget that most technological devices are needed *specifically for the purposes of saving labour*. Tractors, for instance, do not increase food production, they actually decrease it by compacting



the soil and by depriving it of the dung which would otherwise have been produced by the horses and bullocks previously used in their place.

56. Herbicides are only useful because they save the labour involved in weeding. Other pesticides are largely necessary because our large expanses of monoculture provide such an excellent niche for pest populations and, because, by having abandoned rotation, the niche has become a permanent one. If we return to polyculture and crop rotation, we would need far less pesticides. If we also included legumes in our rotation and were energetic enough to spread cow dung on the fields rather than consign it to the nearest waterway, we could largely dispense with

fertilisers. In hill areas, agriculture would benefit still more by labour-intensive methods because terracing can only be maintained by human labour, and without it, especially in tropical areas, the soil rapidly ends up at the bottom of the valley. A rough calculation suggests that it would suffice to increase the agricultural labour force in the UK by four or five times, to enable this country to forego most of the input of machinery and chemicals which have been introduced over the last thirty years.

57. The consequent reduction in resources, and hence the capital required, would have a solution multiplier effect. It would quite obviously be anti-inflationary. It would also create a vast number of new jobs. What is more, these would

be much more stable ones than those available today in capital-intensive, and hence non-sustainable, industrial enterprises. Our food production would also be put on a stabler basis. Its immense vulnerability to discontinuities of all sorts makes it only a question of time before a serious food shortage, if not starvation, actually occurs in one or more of the industrial countries of today. The same principle applies to manufacturing. By making it more labour-intensive, similar advantages can be obtained.

### The Family and the Community

58. If individuals are organised in such a way that they constitute self-regulating family and community systems, their value as a resource increases very significantly.

59. We have seen that all available labour must be fully exploited, but how do we pay for it? To give people a monetary wage would be no use unless it can be used to purchase consumer goods and services, many of which as we shall see, will have to be phased out. What then would they be working for? their food and keep? This smacks too much of slavery. If people cannot be given access to consumer goods and products as a reward for their work, they must be given something else in exchange, but what? There is only one possibility and that is satisfactions of a non-material kind. But what sort of satisfactions? The answer is social ones. The satisfactions which are obtained by fulfilling one's functions as a member of a real family and community. This sounds absurdly idealistic in the materialistic world in which we live. It is, however, both *practical and realistic*. In terms of the hierarchical cooperation principle, behaviour in a stable system must satisfy the needs of both the parts and the whole. The former, as we have seen, fulfil those functions which will enable the latter to survive simply because it is in this way that their own needs are best satisfied. We have noted how this is the case in a stable family system and that it is also true in a community. What, however, are the practical implications?

60. The family in a stable society is an economic, as well as a biological

and social unit. Polanyi, Dalton, and others have shown that in a traditional society, there is, in fact, no behaviour which could strictly speaking be termed 'economic' (designed to maximise the return on capital, or labour). The normal business of producing, manufacturing and selling things was done for social reasons such as to fulfil kinship obligations or to achieve prestige, which is Man's dominant motivation in traditional societies. Specifically 'economic' behaviour is only a feature of a disintegrated society in which social considerations are subordinated to purely economic ones.

61. It is by increasing the scale of economic activities more than anything else that the family and the community have been so terribly disrupted. There is every reason to suppose that by reducing their scale so that they can be fulfilled at a family and communal level, we could ensure the reintegration of the corresponding social systems.

62. This would have a key effect. *Economic activity would once more be governed by the self-regulating mechanisms which once assured the rest of the behaviour pattern of self-regulating families and communities.* In other words people would no longer have to be paid and hence given access to vast quantities of consumer goods and services, which, as we shall see, will no longer be available; or otherwise cajoled into fulfilling their economic task. These will be fulfilled automatically in the same way that people, even today, tend to look after their children.

63. Even in recent times in the rural areas of our own industrial world, the value of work undertaken on a purely voluntary basis largely as a means of acquiring social prestige must not be underrated. In the UK many political and administrative functions are still fulfilled at a local level in this way, by unpaid Justices of the Peace, and other local dignitaries. To transfer these functions to a centralised bureaucracy has served no purpose other than to justify at vast cost our misguided notion of efficiency and social justice.

64. The implementation of such a policy would have a solution multiplier effect of staggering proportions.

Cooperation between the different members of a stable family would reduce very appreciably the following expenditures:

a) Expenditure on domestic appliances and convenience foods, since grandmothers, aunts and children would be available to help with the household chores.

b) Expenditure on housing, since one of the main causes of the housing shortage is the disintegration of the family unit. The number of people per house has fallen very considerably. (In the UK by almost four times.)

c) Expenditure on education, since creches and kindergartens would no longer be required, the family being in a position once more to undertake the earlier phases of their children's education. Educational costs would be significantly reduced with the reduction of emotional instability and delinquency, which are closely associated with family deprivation.

d) Expenditure on medical services, in particular for old people who occupy an increasingly large proportion of hospital beds — not so much because they require medical treatment, but because the disintegration of the family unit means that there is nowhere for them to go.

e) The cost of law and order, since a notoriously high proportion of delinquents and criminals come from broken, or otherwise unsatisfactory homes, and also because in a self-regulating community law and order is assured by public opinion, which is so effective that it prevents any serious deviation from the cultural norm.

f) The cost of transport. Let us not forget the enormous cost to the nation in terms of land wasted to build motorways and airports, in terms of the energy used to power our elaborate transport system, in terms of ecological damage done by the movement of livestock as well as people from areas where certain diseases are endemic, to other areas where the population — human and non-human — have not developed any resistance to the micro-organisms involved and vice-versa.

g) Expenditure on government, quite apart from the prohibitive costs of bad government. There is every reason to suppose that the only effective form of democracy is



participatory rather than elective. It is an illusion to suppose that a society in which people's political obligations are limited to voting once every five years is self governing except in name. Participatory democracy, in which all adult citizens take an active part in running their own affairs, is a different matter. This is only possible in a small community in which there is constant contact with each other, and in which public opinion is formed by the same cultural influences.

### The Ecosystem

65. The restoration of ecosystems to their original glory is quite clearly impossible. The impact on the world population even with the radically lower level of consumption would be too great. To recreate its principal features is another question. To do so would radically reduce, among other things, expenditure on, and damage by, pesticides of all sorts. In an untouched tropical forest, there are massive quantities of insects *but there are no pests*, for insect populations are controlled by self-regulating ecological mechanisms. To exploit the same principles of control in a much simplified agricultural ecosystem, it would suffice to reduce the size of fields, increase the amount of cover, plant many different crops instead of a single one, and adopt rotation. In this way variety, temporal as well as spatial, would be introduced, as in a natural ecosystem and with a similar stabilising effect.

66. Massive expenditures on unsatisfactory water management schemes could be replaced by replanting forests mainly in the watersheds of great rivers and along their banks, re-establishing marshlands and water-meadows all of which would increase the soil's capacity to retain water, prevent streams from drying up and assure optimum water levels. The best way of storing water is in the soil. Reservoirs are expensive, they use up valuable agricultural land. In tropical areas they provide an ideal habitat for the vectors of infectious diseases like schistosomiasis and malaria, and much water is lost from them via evaporation. Also, by raising the water table they tend to give rise to waterlogging and salinity, both of

which have seriously reduced agricultural production in many parts of the world (in particular, in Pakistan).

67. In general, much of the poverty of the third world is the result of the terrible degradation of the natural environment as a result of deforestation and soil-erosion by wind and water. It can only be cured by a massive programme of re-afforestation and soil conservation, with the adoption of ecologically orientated agricultural techniques, together with the reduction of the scale of man's economic activities, all of which would, as a result have extensive solution multiplier effects.

68. Socio-economic decentralisation is a necessary condition for the reconstruction of the family and the community, but it is not sufficient. These basic units of social behaviour must be given once more the power and responsibility for dealing with problems that they have been designed biologically and culturally to deal with.

69. As we have seen, the family must be made responsible for dealing with what are specifically family problems, *They cannot export them*, for instance by consigning children and old people to specialised State institutions. *One cannot over emphasise the role that has been played in the general deterioration of the world around us by the individuals, families, communities and nations, systematically exporting their problems to each other.* Legislative action, in many cases, would be required to prevent this from recurring, and to make social systems at each level of organisation responsible for the solution of their own problems.

70. One such problem is population growth — one of the most fundamental causes of the world's present plight. Our only method of dealing with it up to now has been to export surplus population to less populated lands. If this had not been so, the Malthusian thesis would long ago have been vindicated. Ireland, for instance, has three million inhabitants, and already much poverty and unemployment. Imagine what it would be like today, if she had not exported such a large proportion of her population to the U.S., (there are said to be fourteen million Americans of Irish origin; while half the land

area of the world, including Siberia, has been occupied by Europeans).

71. If we have got away with covering our best agricultural land with asphalt, it is because we have been able to persuade non-industrial countries to provide us with their food, which, by the way, they badly need themselves in return for our largely superfluous manufactured goods. Thirty five per cent of India's exports are agricultural produce. We have thereby effectively exported to them our agricultural land, and so far it is they who have starved and not us.

72. Pollution is another problem whose main solution, as we have seen, is to export it elsewhere. A good example is Britain, which prides itself on the fact that SO<sup>2</sup> levels have been falling, but this is only true because very high chimneys have been built which allow it to drift across the North Sea to Scandinavia where it is stunting the growth of crops and trees.

73. *So long as social groups can get away with exporting their problems elsewhere, there does not appear to be any reason for them to make any effort to solve them.*

74. It is also true that the true significance of the problems involved is not evident to people unless they are reduced to a scale that makes them appear relevant to the business of every-day living to which the preoccupations of the vast majority of people are confined.

75. This is one of the main reasons why important problems must be dealt with at the lowest possible level. A social group will only take the necessary action to control its population, to prevent the destruction of agricultural land, and to prevent other forms of pollution, when it fully realises that *if it does not do so, nobody else will, and that their welfare, indeed their very survival depends entirely on their ability to fulfil these functions as effectively as possible.*

76. But there is a corollary to this principle. If people are to accept responsibility for the solutions to their problems, *these must be of their own creation and not of other peoples.* This means that the central government can no longer impose any development plans on a local

community, which can seriously affect their lives. If the government wishes to build a motorway or a power station, or if a commercial enterprise decides to put up a factory, this must first be accepted by the communities likely to be affected. It is to be noted that something approaching this system is already in force in Switzerland.

77. A further implication of the same principle, and one which we are likely to find still less acceptable in terms of the liberal ideas of today, is that few people are willing to make the effort required to control the population if, at the same time, we are increasing it by *introducing more people from the outside*. If they are to be responsible for the measures necessary to reduce their population, they must also be responsible for those which would increase it. This means that a community must be *closed* — a principle which runs quite contrary to the most cherished ethical ideals of today. Interestingly enough, however, this is already largely the case in Switzerland from whose decentralised political system we have so much to learn. It is, needless to say, entirely the case in traditional rural societies in which the village a person belongs to, even if he no longer lives there, contributes to providing him with his identity as does the family to which he belongs. (In India a man's full name consists of the name of his father, his village, his personal name, and that of his sub-caste).

If a community is to be an effective social system, then its members must be closely associated with each other in a large number of different ways, so that the bonds required to assure its cohesion can be properly established. What is more, for these bonds to be truly effective, it is likely that they should develop over a long period, preferably since childhood. An educational system, in a traditional human society (as in one of non-human animals) is designed to assure the socialisation of its members. Its object is to communicate to children those values which will enable them to fulfil their functions as members of their family and community (a principle which our educationalists have long ago lost sight of).

78. A community need not be totally closed, a certain number of 'foreigners' could be allowed to settle but again, as in Switzerland, they would not, thereby, partake in the running of the community until such time as the citizens elected them to be one of their number.

79. It is only in this way that a decentralised society can be created, in which the extraordinary resources provided by self-regulating family, community and ecological systems are fully exploited to satisfy real human needs. The question is, how is the critical transition to such a society to be achieved? The answer is only by the adoption of a carefully integrated programme, and we must assume, for the purposes of this paper, that it will be adopted by the government of a major industrial nation.

80. The programme, as we shall see, will have to be divided up into distinct parts. These will all be initiated at the same time, though they would proceed at a different pace as they would encounter different degrees of inertia. By its very nature, however, the programme would have to be stretched out over a considerable period of time. One cannot transform a society overnight in an orderly way. In addition, the programme would have to be accepted as a whole. One cannot phase out non-sustainable activities without causing all sorts of problems such as inflation and unemployment, *unless at the same time one phases in to replace them other more sustainable ones*. Nor can one phase in the latter without first phasing out the former so as to free labour and resources for this purpose.

81. For this reason, it is naive to suppose that a government, elected for a five year period can implement anything more than a patchwork of short-term expedients. It is essential that it obtain from the electorate a mandate to implement at least the first part of the programme. To obtain such a mandate, it must first of all make the electorate clearly aware of the extreme gravity of the global situation and hence of any national one — which so far, governments throughout the world have system-

atically played down.

#### The Programme

82. If the programme is to be fully integrated it must be designed to reverse all the essential sub processes of the industrial process. This can be shown to consist of six functionally distinct stages, (though it is not suggested that they actually occur in this order, since positive feed-back will cause them to be constantly affecting each other).

83. The first stage is the development of the very specific world-view, whose main features we have already described. As Weber was the first to point out, without such a world-view, first entertained by the non-conformists and in particular the Quakers in England, there would probably have been no industrialisation.

84. A new world-view must replace it. A study of the values systems of traditional stable societies reveals that though they may vary in many details, their basic features are very similar. In fact it can be shown that, for society to remain stable, a number of basic principles must underly the world view upon which is based its stable relationship with its social and physical environment. Let us briefly consider the basic principles underlying the aberrant world view of industrialism, in order to see how they may be modified to give rise to an adaptive and hence stable social behaviour pattern.

85. *Humanism*. It is essential to the world view of industrialism that man should not be regarded as an integral part of nature but rather as above it, and thereby largely exempt from the laws governing the behaviour of other forms of life on this planet. To justify this, we have postulated a number of abstract entities whose possession by man is supposed to distinguish him from the other less fortunate forms of life. Thus only man has a soul, he alone displays consciousness, his behaviour is supposed to be intelligent, while that of other forms of life is said to be governed by 'blind' instinct. Only human societies are supposed to be capable of cultural behaviour. Such notions are unknown among stable societies for whom Nature is holy and cannot be disrupted without incurring the wrath of the gods. It is by de-sanctifying nature that it has



become socially feasible to destroy it, and by sanctifying man in its stead that the process has been able to proceed at the present disastrous pace. For humanism we must substitute *Naturalism* — respect for the natural world of which we are an integral but only a modest part.

86. *Individualism* Individualism is the notion that man's duties are primarily to himself. It is in keeping with our total ignorance of the nature of the natural systems of which we are a part: the family, the community and the eco-system and of how they are related to each other. For an individual to be a member of a system, his behaviour must be subjected to the appropriate set of constraints. A system is an organisation. As such it displays order, defined as the influence of the whole over the parts. This influence is achieved by subjecting the parts to constraints which will limit their range of choices by causing them to become differentiated. Individualism is another word for chaos. It is unacceptable in a stable self-regulating society, as it is in any stable self-regulating natural system. For Individualism we must substitute *communitarianism* — the need to subject what may appear to be our individual interests to those of the community and the ecosystem. Materialism is closely related to individualism. In traditional societies man's goals are largely social. The accumulation of material goods plays no part in the strategy of his life. material goods only become necessary when they are required for the purpose of satisfying biological and social needs, and even these are but poor compensations. Karl Marx was wrong when he referred to Religion as the opium of the people. Man has always been religious. Religion is an essential part of his socialability which assures the stability of his social environment. It is not *Religion*, in fact, but *Materialism* that is the opium of the people.

87. *Scientism*. Scientism is the notion that scientific knowledge can serve as the basis for social control. Let us not forget that there is no precedent for stable societies based on subjective scientific information. Up until now they have invariably been based on traditional and very

subjective information designed to adapt a particular society to its specific environment, rather than all societies to all environments. It can be shown that only such cultural information satisfies basic cybernetic requirements. As this becomes generally realized, so must one develop increasing respect for the information organized into the cultural pattern of remaining traditional societies. This is essential to the task of social decentralization. For Scientism, in fact, we must substitute Culturalism. *Technologism*, the notion that there is a technological solution to all our problems is a myth closely associated with Scientism, since the only solutions which scientific information can give rise to are technological ones. These, however can play no part in the strategy of nature. We must develop instead a quasi-religious respect for the evolutionary process, whose normal functioning provides the only lasting solution to such problems. For Technologism we should substitute *Evolutionism*.

88. *Institutionalism*. This myth is also closely related to the preceding ones. If benefits are material and technological, then one must create optimum conditions in which they can be dispensed. Such conditions do not exist in the home, therefore institutions must be set up to provide them. Our total ignorance of social and ecological cybernetics leads one to ignore the essential self-regulating nature of such natural systems and assume that their control can be more effectively assured by institutions, ie: external or asystemic controls. For Institutionalism we must substitute a respect for the self-regulating nature of natural systems — a key component of Culturalism and Ecologism.

89. *Economism* is the notion that things must be done because they are economic, ie: so as to maximise the return on capital or on other factors of production. This notion is totally consistent with the others. Indeed if all benefits are material, technological or institutional then this must be the means of maximising them and hence of best promoting human welfare. For Economism must be substituted Ecologism, the notion that things must be done to satisfy not a single end but all the

basic, and often competing requirements of the community and its natural environment.

90. Reform of the educational system would also be required to assure the general adoption of the new world-view. It would have to become considerably more decentralised, and the curriculum would also be changed so that the accent might shift from the random accumulation of data to the acquisition of the cultural information favouring the appropriate socialisation process.

91. The second stage is the development of the technology required for achieving the goals of industrial society. The action required here is to shift our efforts from capital intensive industry to developing the 'appropriate' technology for decentralised living.

92. The third stage is the transformation of society so that it satisfies the requirements of the production-consumption process. People who were once, above all, members of families, communities and ecosystems, and whose behaviour was basically that required to satisfy the requirements of these systems and hence of the larger system of which they are a part, the biosphere, were transformed psychologically and functionally into units of production and consumption. This process is automatically reversed as society is decentralised and the conditions are created in favour of the restoration of the family, the community, and the ecosystem, at which point economic activities become subordinated to social ones.

93. The fourth stage is the generation, by means of the production-consumption process, of the capital required to finance its continued growth. Capital would undoubtedly be required to finance the early stages of the programme designed to prevent social and economic collapse, and to modify the infrastructure of society in such a way as to favour its decentralisation. Slowly the need for capital would be reduced as systemic resources replace asystemic ones.

94. The fifth stage is the production process itself which consists in building up the surrogate world. To reverse this, means

radically reducing the scale of the production process and producing goods increasingly less destructive to the natural environment.

95. The sixth stage is the disruption caused by the fifth which, as we have seen we interpret in such a way as to justify technological, material and institutional solutions which, means further expanding the production process.

96. To reverse this process means reducing the scale of these activities which, at the same time, would permit the restoration of the self-regulating social systems which make up the real world, in terms of whose normal functioning these problems could only be solved.

97. The Government should set up a separate government department to supervise the reversal of each of the six stages of the industrialisation process, in line with the requirements of our programme.

#### Tactics

98. It is unlikely that a government would adopt such a programme until such time as the socio-economic system had still further deteriorated. Its first urgent task would be to prevent the collapse of the economy and also that of the society which has

become its appendage. This calls for a considerable investment programme aimed at providing the necessary employment but designed to satisfy, at the same time, a number of other associated ends. Thus this employment must be as labour-intensive as possible — it will probably have to be in any case, since capital-intensive employment is unlikely to be available. Available capital must be put at the disposal of the different ministries dealing with the six different stages of the de-industrialisation process so that their efforts may be synchronised.

99. The problem of energy would be a pressing one, though it would decrease as the programme got under way and our need for asystemic energy was correspondingly reduced. Investment on increased insulation of houses would be an obvious first step. Another would be the decentralisation of power generation. This would involve the dismantling of the grid (designed to use waste heat for local heating purposes) system and its replacement by small total energy systems (It has been suggested by MacKillop that 2mw generators

producing as much as 4mw of heating capacity and catering for some 500 homes would be most appropriate). Investment in other, at present marginal, energy sources such as windmills, water wheels, and solar collectors would also be justified, regardless of whether such devices were at present economic. They would account for a very small proportion of current energy consumption but a very substantial proportion of the much lower energy consumption which we must aim for. The general adoption of these new devices would play an important part in changing attitudes to energy consumption, and to the values of industrialism in general. *Already they have become the symbols of the new ecological sub-culture which is fast developing, rather as the Charkha is the symbol of Gandhism.*

100. A further necessary investment is the separation of domestic from industrial waste. At present human sewage, which with labour intensive agriculture, would be systematically returned to the land, tends to be polluted with industrial waste. By avoiding this, composting plants can be set up at village and town level, and compost can be made

## SOME OF THE ACCIDENTS AT WINDSCALE

October 1957 Fire in No. 1 Pile. The world's largest nuclear accident.

1958 Calder turbine failure. Caused by failing to find pieces of steel shot that would have been visible to the naked eye in the steam lines.

November 1973 High gamma levels. These could give workers cancer. Caused by defective procedures and/or operator error.

February 1967 Leak of active waste. Caused by overflowing a tank(!). Beach contaminated.

January 1967 Leak of active waste. Caused by failure of concrete, and possibly corrosion. Beach contaminated again. The Marwell 1961 leak was a forewarning.

July 1969 Leak of plutonium to sea. Only made public in 1974. Corrosion a possible cause again in spite of the forewarning of the 1967 leak. Beach contaminated yet again.

1970 Criticality accident, i.e. an uncontrolled release of radiation. The fatal accident at Los Alamos Scientific Laboratories/in December 1958 was a forewarning and was publicised by the World Health Organisation in 1961 and by Thompson and Beckerley in the States in 1964.

September 1973 Fire/explosion in the oxide fuel reprocessing plant. A repeat of the other major accident in 1957 in no less than four ways: both fires, both involving inadequate instrumentation, both involving inadequate operating instructions, and both involving inadequate emergency plans, in spite of the warnings of Thompson and Beckerley in 1964.

November 1974 Monitoring failure; a worker is allowed to leave the plant with plutonium on his shoes. The Harwell 1961 monitoring failure was a forewarning.

May 1975 Leak of active waste. Corrosion a possible cause yet again. The active material found its way through two successive leaks.

April 1976 Leak of active waste from steel drums. Corrosion a definite cause yet again.

October 1976 Leak of active waste from silo. Corrosion a possible cause. Failure of concrete a definite cause. Forewarning in 1967.

December 1976 Leak of active waste. Beach contaminated a fourth time, this time by tritium.

April 6, 1977 Financial Times news item. Site and adjacent area outside contaminated by ruthenium 106. It may or may not be a coincidence that this is the same material that escaped in a major accident in 1973.

#### THIS LIST IS NOT COMPLETE BECAUSE OF THE LACK OF PUBLICITY AND AVAILABLE INFORMATION.

It does not include:  
January 1976 Leak of active waste in a storage tank. The leak was contained within the system. Corrosion was the definite cause yet again.

Atomic Energy Authority (AEA) 1964-65 report: A camera fell(!) into the Calder No. 4 reactor.

AEA 1966-67 report: "Less serious incidents" from which "lessons were learned." You might not agree they were less serious or that the right lessons were learned.

Nor does it include accidents to flasks of irradiated fuel such as derailments, crashes and leaks reported in AEA reports and in the press.

#### THERE MAY BE OTHERS.

Compiled by Dr. Charles Wakstein April 7th, 1977.



generally available to farmers and gardeners. At the domestic level the composting lavatory would be introduced to replace that most iniquitous device, the flush toilet, thereby reducing domestic water consumption, making compost available for agricultural purposes, and preventing the pollution of our waterways.

#### Phasing out of labour-saving technology

101. In many cases, this will have to be undertaken as a matter of urgency, simply in order to prevent the collapse of key services, which can no longer be sustained on the present capital-intensive basis. The cost of the educational system in both the UK and the US has been rising much faster than GNP. In the UK the point has now been reached where it has become seriously short of capital. Predictably the reaction is to reduce the number of teachers rather than abandon the use of the elaborate and totally unnecessary technological equipment (language laboratories, audio visual aids, etc.) with which they have been equipped during the last decades. This extraordinary misguided set of priorities must be reversed. The equipment is expendable — *schools without teachers just do not work.*

102. The inputs to modern agriculture are not only increasingly costly, but their supply is particularly precarious. Shortages of fertilisers and pesticides are becoming increasingly common. Phosphates mainly come from Morocco and could be cut off at a moment's notice for political or other reasons. The oil requirements of modern agriculture are notoriously high. It is variously estimated that between five and ten units of fossil fuels are required in the U.S. to produce one unit of food energy. In the interests of avoiding serious discontinuities, agricultural machinery and chemicals must be phased out as rapidly as possible. This will of course have a solution multiplier effect by creating employment, restoring local communities, and reducing pollution.

103. These processes will occur anyway as the price of capital equipment becomes prohibitive. It is simply a question of accelerating it and synchronising it with those other

measures which would make available the trained labour force together with the appropriate small scale technology it would require to replace these capital-intensive inputs.

104. Fiscal measures should be introduced to accelerate this trend. This would include two taxes proposed in our Blueprint for Survival.

i) "A raw materials tax. This would be proportionate to the availability of the raw material in question, and would be designed to enable our reserves to last over an arbitrary period of time, the longer the better, on the principle that during this time our dependence on this raw material would be reduced ..."

ii) "An amortisation tax. This would be proportionate to the estimated life of the product e.g. it would be 100 per cent for products designed to last no more than a year, and would then be progressively reduced to zero per cent for those designed to last 100+ years. Obviously this would penalise short-lived products, especially disposable ones, thereby reducing resource utilisation and pollution, particularly the solid-waste problem. Plastics, for example, which are so remarkable for their durability, would be used only in products where this quality is valued, and not for single trip purposes. This tax would also encourage craftsmanship and employment-intensive industry."

*In addition:*

iii) A transport tax would encourage the use of local products which are also likely to be less energy intensive and of a more renewable nature.

iv) A legal amortisation rate for equipment that would have to be phased out as a result of the implementation of this programme could be appropriately raised.

105. The adoption of these measures would give rise to at least three problems:

1) Producers would experience difficulty in competing with foreign companies using more capital-intensive methods. This would be a temporary problem, with rising costs, as capital intensiveness would procure an ever smaller commercial advantage. Its solution lies in *persuading other countries to adopt the same programme.* This may not be so difficult as its adoption in one

country would go a long way towards causing others to do likewise. In any case, a discriminatory import duty could be exacted on the produce of countries which had failed to adopt it.

2) Secondly, prices are likely to rise because of the increased cost of production though this is only true vis-a-vis *what they once were, not what they would have been, had the programme not been adopted.*

3) The consequent fall in output would make it no longer possible to pay people the same wage.

107. Such a situation could provide an opportunity for initiating the phasing out of disruptive social services, to make people realise what these extremely inefficient over-centralised State services actually cost them and their families in terms of the taxes they have to pay towards them and the inflationary pressures they give rise to. (In the UK, medical services alone cost each individual family £400 a year.) It should not be difficult to persuade people to forego their claims on such services in return for a cash payment which could be but a fraction of the per-family cost (especially in view of the increasing low cost of the services involved). This payment would partly at least compensate for their reduced purchasing power. Providing people with more money in this way would not be inflationary, since, by the same token we would have reduced government expenditure, by a greater amount.

108. At the same time a considerable effort would be made to change the *pattern of consumption* so that money should be diverted from the purchase of capital-intensive goods and services to that of more labour-intensive ones. In an Industrial society, consumer products are acquired less for the comfort and convenience they might procure than for reasons of social prestige. This being so, to bring about change in this pattern of consumption, it would suffice to induce corresponding changes in the determinants of social prestige. The advertising industry has perfected the art of obtaining the connivance of socially prestigious figures for bringing about changes in consumption patterns favouring the commercial success of particular wares. Their

services would undoubtedly be available for bringing about, in similar manner, changes to the present pattern of consumption which favour the success of our programme.

109. The changes required are in any case those already under way as part of the growing reaction to the industrial way of life. Let us consider some of them.

a) In the last few years only, 'self sufficiency' has become an 'in' word. More and more people grow their own fruit and vegetables. This trend could be radically accelerated. We could follow the example of Italy where five million urban dwellers still indulge in part-time agriculture. People could be encouraged to acquire small-holdings in rural areas. The current tendency toward favouring large agricultural enterprises fiscally and other wise could and indeed must, be reversed. If this were generalised, it would have an impressive *solution multiplier* effect by leading people to identify themselves with rural communities. It would also provide them with a new interest in life, a veritable new goal structure, all of which is of key importance to people lost in the anonymous world of large cities and increasingly deprived of any purpose in life. At the same time, allotments could be created near city centres. They should be regarded as a high priority land use. More and more space could be allocated to this end, as the infrastructure of industrial society is gradually dismantled. All this could be encouraged in many ways. Gardening and agriculture could play an important part in the curricula of schools, and school time could be allocated to work on allotments or farms.

b) Also, as a reaction to industrially produced food, there is a growing interest in cooking, a creative and satisfying occupation, which should also figure prominently in school curricula. Cooking schools should also be opened for adults, for whom preparing meals has so far largely consisted in opening cans and thawing out frozen foods. Cooking skills could figure advantageously among the desirable social accomplishments of our post-industrial society, as indeed they did in the pre-industrial one.

111. Another is the playing of musical instruments. An orchestra, however amateurish, makes a greater contribution to a festive occasion than does the most elaborate juke box or hi-fi set. If people were to spend their money on hiring string quartets — which only the rich can afford today — many of our problems would be solved.

112. What is, in fact, required is the *ritualisation of economic activity*, in the sense in which aggression can be ritualised — that is to say by providing a maximum outlet for instinctive drives — by channelling them in those directions which cause the minimum damage to the social and physical environment. This means producing goods and services which are not only labour intensive, and make use of naturally occurring materials, but which are largely of aesthetic and ritualistic appeal, instead of those which are purely utilitarian and which *thereby usurp functions which should be fulfilled by natural systems* giving rise to the corresponding deterioration of the real world. This principle, needless to say, goes quite contrary to the *utilitarian ethic*, which is so strong in such countries as the UK that anything that is aesthetically pleasing tends to be regarded as immoral. As our programme is implemented, conditions would increasingly favour the 'ritualisation of economic activity'.

113. But what happens to those who are already unemployed and those who might lose their employment, in spite of the measures we might take to prevent it? The only solution that satisfies the other requirements of the programme would be to enrol them into a new organisation, which would be known as the 'Restoration Corps'. All school leavers should be made to serve for a period of say a year and a half in it. Its role must be primarily to clean up the mess left by a century and a half of industrialisation — restore derelict land, replant hedgerows, restore forests, clean up tips where poisonous waste threatens ground water reserves.

114. The Restoration Corps would fulfil all those tasks which would be necessary for the success of our programme, but which would not be economic, so that normal employment would not be adversely

affected. It would be organised into local groups, each one being responsible for work in its own home area. This is important, since more enthusiasm can be mobilised for cleaning up one's own locality than somebody else's and the life in the Corps must be made as attractive as possible since the financial rewards would be minimal. All unemployed people would automatically have to join the Restoration Corps, unemployment benefits being altogether eliminated. This is very important since unemployment is not merely a question of material deprivation, but also of social deprivation leading to loss of self esteem, and causing demoralisation, broken marriages and social deviancy. In this way the welfare-system could be further dismantled.

115. After graduating from the Restoration Corps, a youth would be made to serve in the Defence Corps, a militia equipped with light weapons only, and organised on a local basis, with periods of duty for several weeks each year, as in the Swiss Army. The present massive expenditure on armaments together with the growing role it plays in International trade, is one of the scandals of our time. Heavy equipment is unnecessary for the defence of one's homeland. The Vietnam War saw the victory of *men over machines*. It showed that a peasant army, if its morale is high enough, can defeat an army equipped with the most sophisticated weaponry of all time. Unilateral disarmament is recommended. War, like all other pursuits, should be *labour intensive* and on as *small a scale as possible*.

116. Both the local Restoration Corps and the local Defence Corps would help build up local patriotism and the spirit of public service which are quite essential for the effective decentralisation of society.

### The Phasing out of Consumer Products

117. As the programme is implemented, so will people have ever less money to spend on consumer products. This means that at the same time the *need for consumer products must be correspondingly diminished*, which, as we have seen, could only be done by restoring the functioning of those natural systems —



which once provided those benefits for which consumer products are but compensations.

118. One of the most important ways of achieving this is by removing such compensations in as painless a manner as possible. Thus, by reducing the number of consumer goods which people require, it will no longer be necessary for *two members* of the same family to go out to work. Women would once more be able to look after their children properly with a very significant solution multiplier effect. It is also only in this way that small farms can conceivably survive, for although a small farm can provide a satisfying way of life, *it cannot supply the financial surplus necessary to satisfy today's consumption pattern*. The same principle holds good for artisans and small shopkeepers; while as we know, the maintenance of today's consumption pattern is equally incompatible with the survival of the ecosystems which make up the real world.

119. The consumer goods we wish to phase out must simply be *removed from the market*. Taxing them is not sufficient, as they would possibly still be regarded as a desirable acquisition, while their growing inaccessibility would lead people to feel that their standard of living was correspondingly low. By removing them from the market, on the other hand, life styles would change *to accommodate their absence*, the cost of living would thereby be reduced.

Since consumer goods start off as luxuries and gradually become necessities as life styles change to accommodate them, we would have to start off by phasing out luxuries which have *not yet been transformed into necessities*. In this category one can include colour television sets, private motor yachts, snow-mobiles, large automobiles, video-tape recorders, electric toothbrushes, electric carving knives, etc. From the point of view of the consumer this is unlikely to cause too great a hardship. From the point of view of the producer, it would undoubtedly do so if *other activities were not phased in to replace their manufacture*. This, however, presents few problems, in view of the massive new investment programme, described above, in more desirable and sustain-

able enterprises.

120. To suggest that dish-washing machines and other domestic appliances should be phased out, would meet with instant opposition. These are undoubtedly needed in a family consisting of but two or three people and in which both husband and wife must go out to work. They would become quite unnecessary, however, once the family had become re-established and eight to ten people once more inhabited the same house, and also once each family required but a single wage earner for its support.

121. Needless to say, the gradual phasing out of such consumer products would have a solution multiplier effect whose nature, the reader should be able to judge for himself, on the basis of the above analysis.

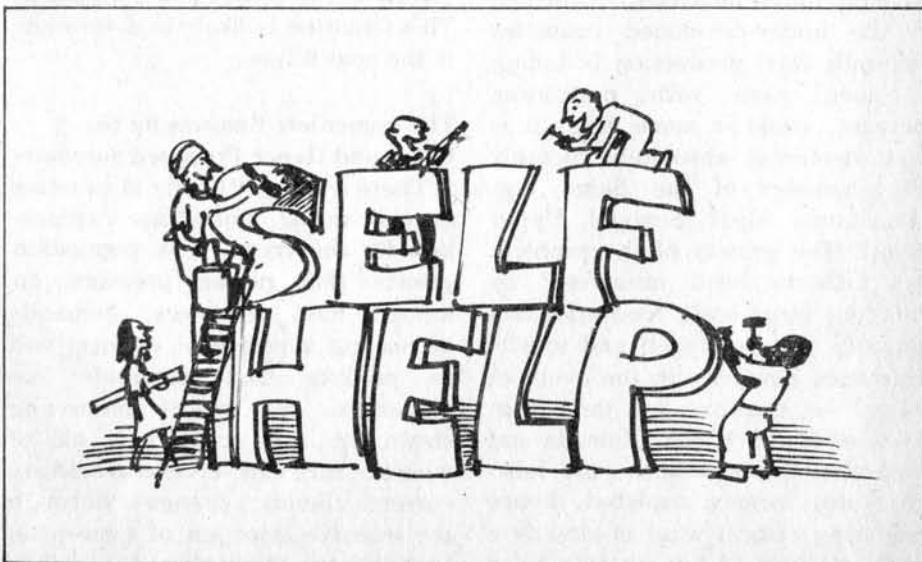
122. In all these ways we would slowly achieve the Gandhian ideal for a nation state as an association of 'village republics' loosely organised into larger social groupings, and in which economic activities were carried out on the smallest possible scale, so as to interfere as little as possible with their social and physical environment.

123. What is particularly important is that popular enthusiasm should be aroused for the social philosophy which underlies this programme. At present there is considerable disenchantment with the benefits of modern industry, while conventional wisdom is losing much of its credibility. It is but a question of time, perhaps no more than a year or two, for this disenchantment to yield to total disillusionment, and for conventional wisdom to become

correspondingly discredited in the face of the ever more obvious failure of the expedients we exploit to solve our worsening problems. At this point panic will set in and people will grope about frantically for an alternative social philosophy with an alternative set of solutions. The most attractive is likely to be the most radical — the one which provides the best vehicle for expressing the reaction to the value of industrialism. The Ecological social philosophy best answers these requirements. Right wing and Left wing movements have but alternative recipes for baking the industrial cake and alternative ways of distributing its slices. We would be offering a totally different cake, which should not only prove the most satisfying but also the only one whose ingredients are likely to be available.

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# THE RETURN TO TRADITIONAL AGRICULTURE

## The only means of solving the world food problem

by Eric Waddell

**The application of modern agricultural techniques in tropical areas disregards local realities and is ecologically and socially disastrous. A return to traditional methods, proved over thousands of years, is the only way to overcome the threat of future famine.**

We are presently being inundated with reports and statistics regarding a looming world food crisis. But amidst it all what are the pertinent facts?

While world food production continues to maintain a long-term annual rate of increase of c. 3 per cent that is therefore somewhat superior to the rate of global population increase (2 per cent) this is largely on account of substantial increases in production that have occurred in the developed countries. In the under-developed countries generally food production is failing to keep pace with population increase, while in some cases it is even declining absolutely (notably the countries of the Sahel e.g. Mauritania, Niger, Senegal, Upper Volta). The gravity of the problem has hitherto been minimised by effecting large-scale food transfers between the developed and under-developed countries in the event of crises — drawing on the grain reserves of the U.S.A., Canada and Australia. These reserves are however now largely depleted, hence rendering critical what is already a grave situation where it has been

estimated that 10-20 million people die every year directly or indirectly from lack of food.

Further to this crisis of diminishing food reserves per capita, two other problems have recently manifested themselves — a global energy crisis that is being translated into a fertilizer crisis (because many are oil-based) and widespread climatic deterioration (global cooling, decreased atmospheric vapour, etc.) that has manifested itself most vividly in the recent Sahel droughts. This situation is likely to deteriorate in the near future.

### **The immediate Reasons for the Crisis and Hence Proposed Solutions**

There is little difficulty in isolating an over-riding, immediate explanation for the crisis; it is **population growth that places pressure on limited food resources, demands increasing supplies of energy both to produce and distribute the resources, and places increasing strain on the ecosystem, all of which in turn can serve to accelerate current climatic changes (through the massive injection of man-made heat into the atmosphere, as well as**

through over-grazing and deforestation).

Ready solutions are likewise forthcoming — curbing population growth through massive birth control schemes such as those initiated in India where large-scale 'vasectomy fairs' recently travelled through the countryside, or mastering drought and increasing food production through such grandiose schemes as, for instance, ex-President Hamani Diori's (Niger) proposed "Marshall Plan — for Africa" where he suggested drilling 2500 wells to an average depth of 900 feet across the country, at an estimated cost of \$230 million.

### **The Real Reasons — Population Redistribution and "Development"**

Workable or not (and I shall later suggest their unworkability) both 'solutions' see the problem as arising out of 'natural' phenomena that are nevertheless amenable to human intervention. Closer investigation of what is going on in the Third World however indicates the problems and therefore the fundamental reasons for the crisis to be far more complex.

Much more critical than overall



growth of population is its redistribution. The world's population is being urbanized very rapidly. In 1880 only 1.7 per cent lived in localities of 100,000+ persons, in the early 1960's the figure was 20 per cent, and by 2000 it will be an estimated 75 per cent. Further the rate of urban growth in under-developed countries tends to be higher than that in developed—In Lagos it is four times more than it is in Los Angeles for instance. Such a development is critical in the Third World since it dictates a radical shift from subsistence modes of production to ones in which larger and larger surpluses must be created to support an expanding non-agricultural population. In addition complex marketing systems must be created in order that the surplus gets to the urban consumer. This is no easy matter in countries where, traditionally, systems of exchange were frequently based on the principle of reciprocity and were restricted to kin, and where mass transportation systems were non-existent.

That stresses result is not surprising. What is, is the fact that they are actively stimulated by the developed nations. Cities are viewed as centres of the modernised sector of a Third World economy, dynamic growth poles that stimulate development through the surrounding areas, and also environments that stimulate the propensity of their inhabitants to consume — which consumption will in turn aid the industrialisation programme. In such circumstances the rate of urbanisation typically runs ahead of the capacity of a nation to support an urbanising sector.

At the same time production in the agricultural sector itself is endangered. Agricultural development is directed almost exclusively towards the production of commercial crops, that is commodities that have a commercial value in the developed nations. These include both food (coffee, cocoa, sugar cane, etc.) and industrial (sisal, oil palm, pyrethrum, etc.) crops. Notably few have any direct value to the producers. They are only useful for the revenue they generate from the sales of these commodities to the developed countries. The need for

cash is considerable (taxes, changed agricultural technology, new patterns of consumption) but the terms of exchange are frequently highly unfavourable. The results? The production of commercial crops frequently enters into direct competition (for land and labour) with the production of subsistence crops — to the detriment of the latter . . . and the nutritional status of the population deteriorates accordingly. The same argument applies to those who sell their labour as plantation workers — energy costs are very high in relation to wages, and the purchasing power of wages is very low since most of the foodstuffs available in the market place are imported (the mechanisms for marketing locally-produced foodstuffs often being very poorly developed). Thus, over the past decade food imports of developing countries have been increasing at a rate exceeding that of their population growth, the trend claiming at the same time a growing share of their total import capacity.

Thus the whole thrust of development is to strengthen the links between developed and under-developed nations, as well as to impose Western models of development through urbanisation and industrialisation. And wedded to this is the legacy of another era of metropolitan-satellite relations, where the dominant ethic was one of social rather than economic welfare — a preoccupation with health and nutrition within a Christian (charitable) framework, and education and religion within a civilizing one. Little thought was given to the capacity of the economic system to support this particular type of intervention. Famine relief (involving massive food transfers) is frequently a simple continuation of this philosophy.

### **Proposed Solutions to the Food Problem**

But to return to my initial observation. Everyone is in agreement that there is a food problem. But what kinds of agricultural solutions are envisaged by the developed nations? Generally speaking, the concern is to increase the level of production through the transfer of Western technology. Consider what is described as the "Green Revolution."

Greatly increased yields are envisaged through a combination of high-quality varieties of grain, greatly increased use of fertilizers, and more complex forms of irrigation /tillage. In sum, traditional modes of production are swept aside as being 'primitive', inefficient, irrational and so forth. At the same time the increased efficiency that is envisaged serves to release a pool of surplus labour which can be re-directed to the industrial sector of the economy in order to stimulate the development process.

The irony of all this is that neither does the "Green Revolution" approach appear to work (it reinforces dependence on the developed nations on increasingly unfavourable terms,\* it disregards the local reality, and is ecologically very vulnerable — consider the Groundnut Scheme, the irrigation of the Sind, the Aswan Dam, etc.) nor does it do justice to customary modes of production.

In this context the film "Rice" comes readily to mind. Prepared in 1964 to publicize the work of the International Rice Research Institute in the Philippines — the initiator of one of the Green Revolutions — it starts by panning across the remarkable engineered landscape of the Ifagao in Luzon, and dismisses their system of paddy-rice cultivation as one that is changeless (governed by tradition, ritual and the crudest of technologies), and that produces "just enough" to meet the daily needs of the local population and no more. Traditional conservatism (negative) is set against modern innovation (positive), and yet the system so readily dismissed as one capable of adequately supporting population densities in excess of 2000/mi<sup>2</sup> while maintaining a stable social order and ecosystem. Some areas have been under cultivation for one if not several thousand years! This is only one of many such intensive systems of production found in the Third World, all of them characterized by a remarkable degree of ecological sophistication and capable of supporting high population densities, and yet requiring very simple technologies to

\* It involves new, high-technology forms of farming that are directly threatened by current soaring prices and shortages of fertilizer and energy.

maintain them. All have, in addition, stood the test of time.

Perhaps, given the poverty of our own solutions to deal with the food and population problem, we should look to the accumulated experience of the peasantry of the under-developed nations. Therein certainly lies the wisdom of Mao Tse-Tung in China in his concern to eliminate the fundamental contradictions between town and country, agriculture and industry, manual and intellectual labour.

#### Agricultural Systems and Societies

What does the study of their agricultural systems tell us? The two basic components are population and resources. The Malthusian revival tells us that population tends to increase geometrically and resource production arithmetically. The history of mankind is centred, in an adaptive sense, around the interplay of these two forces. The primitive and peasant societies of the now under-developed countries were as subject to them as ourselves. Historically they had two options, either to control population density or increase agricultural production. Both were utilized.

*Population control.* While high mortality rates due to poor medical knowledge were everywhere the case, they were rarely sufficient to eliminate population growth. Warfare certainly played a part — inspired by competition for land and resources. But efforts — frequently very effective — were also made to influence birth rates. All did not begin with techniques of surgical intervention or contraceptive devices. Rather there were frequently very effective social mechanisms — determining the age of marriage, influencing birth intervals etc. For instance, New Guinea highlands societies generally condemn intercourse between husband and wife while a child is being breast-fed. And breast-feeding normally lasts for 4 or 5 years. In effect, we are speaking of post-partum sexual abstinence periods of the order of 4 to 6 years, and this in societies where extra-marital sexual intercourse is strongly prohibited!

For such mechanisms to be effective they were of course depen-

dent on the values and social order of a society remaining intact, which conditions no longer apply.

Together the various constraints ensured population growth rates never exceeded 1 per cent per annum, a figure that is very low by modern standards but which nevertheless meant that pressure on resources was a common recurrence.

*Agricultural intensification.* Population pressure was also managed through intensifying agricultural production. Essentially fallow cycles are progressively shortened, there is a shift from mixed cultivation to monoculture, and also a shift from a system where fertility is restored naturally by means of a long fallow (the 'closed nutrient cycle') to one in which it is maintained by increasing human (and other) energy inputs, in tillage, mulching, irrigation, etc.

The process is I think obvious to us, for all industrial (and therefore agriculturally-based) societies have gone through it; it is the historic transition from shifting cultivation with no pronounced staple to annual and multi-cropping of rice or other cereals. What is interesting about it in pre-industrial societies (the present under-developed nations) is that it generally only occurs in response to population pressure. People will only do it if they have to — in order to support higher density populations. The reason is simple — the process involves a shift from land to labour as a principal factor in production, and with intensification returns to labour tend to decrease. The most efficient systems are the most extensive (because "nature" does most of the work) — perhaps 1000 hours per family per annum are needed to manage them compared with about 5 times the figure for the most intensive systems. Nobody in their right mind would intensify in such circumstances, for diet tends to deteriorate too. As one hunter and gatherer in the Kalahari desert said in answer to the incomprehension of a visiting anthropologist, "Why become a farmer when there are so many mongongo nuts in the world?" He only had to work 2 or 3 days a week to be adequately fed on a very

diverse diet.

These systems of production are of course principally subsistence-oriented. The household consumes most of what it produces, and surpluses are produced only to minimize risks from crop losses. Beyond that there is little reason to produce more since levels of production are largely nutritionally and not culturally determined. In these respects such systems differ markedly from those of our own society, whose goals are the maximisation of profits and where increased production is seen as an end in itself operating independently of demographic variables.

Finally, another of the basic features of pre-industrial societies is that their production systems are designed to make maximal use of available labour — a social goal, the accommodation of the entire labour force in the system of production, and therefore the assurance of maximum social stability, prevails over an economic goal, maximum efficiency, which dictates shedding of surplus ("under-employed") labour.

#### Conclusions

The effectiveness of customary responses to population growth cannot be denied. Ecologically, sociologically and nutritionally they are sound. The intensification process of course can only occur at a certain 'cost' — the 'quality of life' tends to deteriorate in the sense that the producers must work progressively harder in order to make ends meet, while at the same time the quality of their diet tends to deteriorate in terms of palatability (variety) at least. However such a loss is minor compared with modern problems.

The question is, however, to what extent is a traditional capacity to deal with population pressure relevant to the contemporary context? Here two major difficulties are encountered, one demographic and the other developmental. Present population growth rates in the under-developed countries are far in excess of those they have customarily had to cope with. Even the 1.7 per cent per annum proposed at the recent U.N. conference at Bucarest is. They scarcely give the population



time to intensify before experiencing massive environmental deterioration. And yet the modern media of instruction could presumably be utilized to transmit the necessary agricultural information and thus accelerate the adjustment process. Here again, I think we have a great deal to learn from the Chinese with their constant dialogue between peasant and urbanite, and the respect for the former that follows from it.

More serious is the whole strategy of development which tends to preclude local responses — the isolation of these societies is systematically undermined, generating both cultural and economic dependence. The model proposed by the developed nations is accepted, and in order to implement this model increasing dependence on those same nations is generated in order to obtain capital, technology and know-how at most unfavourable terms.

At the same time the under-developed nations are experiencing urbanisation of a large segment of the population in a context where neither the peasant producer nor the managers of the agricultural economy are geared to feeding it.

### ... And a Suggested Solution

Absurd as it may seem an effective, long-term, solution to the food and population problems of the Third World may well lie in reducing rather than in intensifying their links with the developed nations, and in rejecting Western models of development based on massive industrialisation and urbanisation. To act in such a way demands, of course, a great deal of courage in challenging the objectives of the developed nations (who after all are heavily committed to intensifying trade relations in order to obtain the resources on which they are dependent) and the aspirations of the under-developed nations own elite whose goal is a life style similar to our own.

Such a recourse is not, however, without precedent. Mahatma Gandhi's goal was the revival of "village India". He opposed mechanisation and urbanisation wherever abundant labour was available. He stressed the moral superiority of self-employment and of frugality

and he ascribed great symbolic importance to the spinning wheel (charka). And he promoted the ethic of swadeshi: "The spirit in us which restricts us to the use and service of our immediate surroundings to the exclusion of the more remote." More recently Julius Nyerere in Tanzania, with his concept of African socialism (ujamaa), has directed his country's efforts towards similar objectives.

Finally, the Chinese have been concerned, since the Cultural Revolution (1966-69), to prevent urban-industrial dominance — urban migration appears to have ceased and an outward flow has been initiated where 8 million young people have left permanently for the countryside and the population of Shanghai has declined by 500,000 to 5.6 million. In addition a whole range of functions have ceased to be typically 'urban', thus eliminating one of the main reasons for the flow.

We are presently witnessing exactly the same phenomenon in South-East Asia with the communist victories in South Vietnam and Cambodia — of *de-urbanisation*. It is the cities which are being evacuated as a permanent measure (Da Nang, Saigon, Pnom-Penh etc.) and contacts with the outer world are being systematically ruptured. These are not victories of one political ideology over another but of the peasant over the urban-dweller, of the nationalist over the internationalist.

### Conclusion

The approaches proposed by Gandhi, Mao and Nyerere are the only sure way to establishing a balance between population and resources — one where desires are limited so that they don't assume the absurd proportions of the developed nations, and resources are more equally distributed. In turn the rate of population growth might also decline through the reinstating of appropriate indigenous social controls.

This was indeed in part the message of the underdeveloped nations at the recent World Population Conference. But for us, in the developed nations, to accept it obliges us to admit that, while

the problem may well be "out there", the solution to it is more than likely right here, and it lies not in aid, technology transfer, trade and charity, but in our cutting back our demands on those nations (by imposing thresholds to our own demands for resources) and ceasing to impose upon them our models of development. Such certainly are the implications of the following observation made by a Solomon Islander from the Western Pacific Ocean:

One day, long, long ago, a man was fishing on the reef, and he saw something out to sea. It appeared to be an island, but it moved. He ran to the beach shouting 'An island is coming here', and quickly the people gathered on the beach to watch a sailing ship approach and anchor off the reef. The inhabitants of this island came ashore, and our island-world ceased to be. The world exploded, and our island became a remote outpost . . . the last place in a country which has few centres and much remoteness (Luana, 1969).

Are we prepared to so radically change our behaviour? Are we capable of tolerating active strategies of isolation (economic, ideological and other) in the satellite nations of the world? Has any elite or metropolitan power ever voluntarily foregone its power and privilege? Do we really want to solve the world food problem, or do we see it as the ultimate weapon in the emerging conflict with the Third World over control of essential resources (as Kissinger and Butz have implied)?

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## Feature Review by Peter Bunyard

### ENERGY STRATEGY: THE ROAD NOT TAKEN? by Amory Lovins

Amory Lovins is surely a remarkable character. Years ago, when environmentalism was in its infancy Amory dropped by one evening to talk about energy, and having heard that he had some talent on the piano I persuaded him to sit at the tinny upright that had been dumped on us, even though he claimed that it was ages since he had last played. I know that Moussorgsky's *Pictures at An Exhibition* is no mean piece, but we had an enjoyable performance of it that evening, as well as of Debussy and some composition of his own, and I wasn't surprised when Amory told us that at 16 he had considered a career in music, but had then opted for physics. A few years later, when he was at Oxford nearing the completion of his PhD in physics, he came to another decision, no less momentous than the first, and gave himself up to full-time work for Friends of the Earth.

Since 1971 Amory has written five books for FOE, most of them about energy, and he is now on his sixth. *Not Man Apart*, the journal of the American branch of FOE has recently published part of that latest work, and it is evident, once again, that Amory has managed to pull the multiple strands together and produce a coherent, optimistic vision of the kind of energy option for which all of us should be striving both as conscientious consumers and as those opposed to the grandiose nuclear power schemes conjured up by the Big is Best brigade.

With a glut of oil on the world market, mainly because of depressed economies, it hasn't taken long since the fearful days of the Arab oil embargo for countries like Britain and the United States to be talking once again of taking up the slack and embarking on a growth economy. Indeed in Britain a minimum of 2 per cent growth rate has become the magic formula for extricating us from our economic ills. Taking the United States as his example Amory Lovins points out what growth in

energy consumption would mean, especially if it is achieved through minimizing oil imports and relying instead on coal, nuclear power, and offshore oil. Over the next ten years, to achieve growth in energy, the United States would have to develop 900 new oil wells offshore, 170 new coal mines, 100 new uranium mines, a new enrichment plant, 40 fuel fabrication plants and three fuel re-processing plants. Meanwhile 180 new 800 megawatt coal-fired stations, 140 new 1000 megawatt nuclear reactors, 60 conventional and over 100 pumped-storage hydroelectric plants as well as 350 gas turbine plants would have to be constructed to supply the increased demand for electricity. All those new plants make up a staggering inventory of equipment, and 100,000 engineers, 420,000 craftsmen and over 140,000 labourers would be required to get them built. And that is just the beginning, for should one indulge in extrapolations until the year 2000 and beyond, the growth scenario becomes self-evidently absurd. Indeed it wouldn't be long before a growth-besotted industrial nation began to run into all kinds of barriers to progress; the localized heating of the environment, the lack of technicians and the sheer expense of it all, for example.

Lovins states that the cost of providing the energy equivalent of an extra barrel's worth of oil per day to the consumer has mounted from a few thousand dollars (today's worth) in the 1960s to more than 20,000 dollars for many of the gaseous and liquid fuels proposed in the coming years — oil from shale for example, or gas and liquids from coal. But electricity is unquestionably the Rolls Royce of energy types, and we should therefore be questioning hard the proposition of an all electric economy. Thus for coal-electric capacity ordered now, the cost of delivering the energy equivalent of one barrel of oil per day is in the region of 150,000 dollars, whereas for nuclear power it is between 200,000 and 300,000 dollars. Amory concludes that the capital cost per delivered kilowatt of electricity is

some 100 times greater than that of the traditional direct-fuel technologies on which the industrial society has been built. Who is going to afford it? And what about all those hidden costs, such as clearing up the environment when the plant is obsolete, and ensuring the safe disposal of the wastes, whether they be from fossil fuels or nuclear power?

The investment required to *save* the equivalent of an extra barrel of oil per day ranges from nothing to at most 25,000 dollars, which overall is considerably less than the investment required to *find* it. Better building designs, with improved thermal insulation, and the added bonus of capturing solar energy would undoubtedly save large chunks of energy and money. That saving can be augmented by 'cogeneration' whereby electricity is generated as a by-product of the process stem normally produced as a waste-product in many industries. A Dow study claims that by 1985 US industry could meet nearly one half of its electricity needs by such means, compared with one-seventh today. What a saving that would mean. According to the report widespread cogeneration would obviate the need for 50 large nuclear reactors, save fuel equivalent to two to three million barrels of oil per day and save up to 50 billion dollars. In Germany 12 per cent of total electricity production is produced by cogeneration; so why not here in Britain, especially if there could be government incentives to get the scheme going on a big scale? Indeed we should not be talking of Drax Bs or of nuclear plants in order to salvage the big turbine makers, but instead of getting industry used once again to the small-works-best approach.

Substantial energy savings result from limiting the use of electricity. Its use can be justified for powering electric motors, for electronics, for lighting, arc welding and for specialist industrial operations such as electro-metallurgy. But more than one third of the electricity generated in the United States (and a similar situation prevails in Britain) is used for low temperature heating and cooling, which with three tons of coal equivalent to produce one ton coal equivalent of electricity is energy



wasteful, especially so when we consider that electricity is a high-grade form of energy. Should Britain and other industrial nations opt for the hard energy path, using nuclear reactors and large coal-burning power stations then inevitably the efficiency of energy use will drop even further.

Plainly we are using premium fuels and electricity for many tasks for which their high energy quality is superfluous, wasteful and expensive, and a hard path would make this inelegant practice even more common. Where we want only to create temperature differences of tens of degrees we should meet the need with sources whose potential is tens or hundreds of degrees, not with a flame temperature of thousands or a nuclear temperature of millions — like cutting butter with a chain saw.

If energy-saving can get us through the next decade or two without our having to launch into absurd, unwarranted schemes, then the soft energy option, as long as we pursue it resolutely, will enable us to maintain, (or for those who don't yet have it, to attain) a reasonable life-style with quality and stability as the out-

standing features. Just as the hard energy option, and the all-electric economy would influence social structure so equally would the soft energy option. And it isn't just a matter of preference, it is a matter of survival.

Amory has listed the five main characteristics of soft technologies:

- they rely on renewable energy flows . . . and depend on energy income, not on depletable energy capital..
- they are diverse, so that energy supply is an aggregate of very many individually modest contributions, each designed for maximum effectiveness in particular circumstances.
- they are flexible and relatively low technology — which does not mean unsophisticated but rather easy to understand and use without esoteric skills, accessible rather than arcane.
- they are matched in scale and in geographic distribution to end-use needs, taking advantage of the free distribution of most natural energy flows.
- they are matched in energy quality to end-use needs.

Not all solar energy schemes fall

into the above list, some of them becoming hardened by the tendency towards making power centralized and big. Thus Amory does not go along with the idea of the world's desert sands being covered in multiple collectors, or of satellites the size of Brooklyn Bridge beaming down their extraterrestrial concentrate of solar energy. Such schemes ironically are the ones now receiving the most attention in terms of funds — all fall into the trap of alienating the consumer from the source of his power.

But, solar energy can be captured in many subtle ways and Amory alludes to the conversion of agricultural, forestry and urban wastes to fuels with the aid of micro-organisms. Imagine, at the present time, the US beer and wine industry produces 5 per cent as many gallons as the US oil industry produces gasoline. It only needs a bit more trying, and perhaps a little less drinking for organic conversion to meet all transportation needs.

Many of us have become aware of the dangers of the hard option path, the inordinate capital cost, the inevitable growth of what has been described as 'friendly fascism' which

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### FRIDAY 1 JULY

- 10.00 ARRIVAL & REGISTRATION  
11.30 WELCOME TO OXFORD  
Dr. A. Gatherer, Area Medical Officer, Oxford.  
11.45 PRESIDENT'S ADDRESS  
Dr. W.W. Yellowlees, General Practitioner, Scotland.  
14.15 NUTRITIONAL ECOLOGY FOR THE FUTURE  
A Feasibility Study  
Mr. Howard Liddell, Senior Lecturer at School of Architecture, Hull.  
Mr. Sedley Sweeny, Organic Farmer in Wales.  
15.15 DISCUSSION  
16.45 SYMPOSIUM: PERSPECTIVES IN NUTRITION EDUCATION  
TEACHING NUTRITION IN THE U.S.A.  
Mrs. Anne Jones-Haas, Nutritionist, Teacher Executive Director of CABOL, Consumer Association for the Betterment of Living, Vermont, U.S.A.  
A NEW CONCEPT IN NUTRITION AND DIETETICS  
Miss R.E. Longstaff, Area Dietician, Oxford.  
THE TEACHING OF NUTRITION IN THE HOME  
Miss G.M. Fullard, Health Education Officer, Oxford Area.  
A SURGEON'S APPROACH  
Mr. Maurice Frohn, Consultant Surgeon Bethnal Green Hospital, London.

### 20.15 DIET & DISEASES OF AFFLUENCE

The Value of Illustration in Communication.  
Mr. Dennis Burkitt FRS, Department of Geographical Pathology, St. Thomas's Hospital, London.  
In the chair: Dr. Kenneth Barlow, Chairman of the McGarrison Society.

### SATURDAY 2 JULY

- 9.15 THE TEACHING OF NUTRITION IN A UNIVERSITY MEDICAL SCHOOL  
Dr. Gaston Pawan, Senior Lecturer in Metabolism, Department of Medicine, Middlesex Hospital Medical School, Hon. Sec. The Nutrition Society.  
9.45 PROGRAMME FOR ACTION: BREAD  
Dr. Geoffrey Taylor, formerly Professor of Medicine, Lahore University.  
10.15 DISCUSSION  
11.30 THE ASCENT OF FOOD MYTHOLOGY  
Dr. Ross Hume Hall, Professor, Department of Biochemistry, McMaster University, Ontario, Canada.  
12.15 DISCUSSION  
15.15 'OUR DAILY BREAD'  
Film showing nutritional differences between wholemeal and white bread.  
Mrs. Margaret Brady, Author, Lecturer.  
17.00 INITIATING DIETARY CHANGES IN THE COMMUNITY  
Dr. K.O.A. Vickery, District Community Physician, Eastbourne.

### 17.30 QUESTION & ANSWER SESSION

Panel:  
Mr. Max Blythe, Health Education Co-ordinator, Oxford.  
Mrs. Hilary Davies, Senior Lecturer in Food & Nutrition, Ilkley College.  
Dr. Jim Mann, Department of Social and Community Medicine, University of Oxford.  
Dr. K.O.A. Vickery.

### 20.15 NUTRITIONAL SAFARIS

Mr. Denis Burkitt, FRS, Department of Geographical Pathology, St. Thomas's Hospital, London.  
Mr. Conrad Latto, Consultant Surgeon, Royal Berkshire Hospital, Reading.  
In the chair: Mr. Harry Walters, Consultant in Food Science and Technology (UK Section).

### SUNDAY 3 JULY

- 9.30 A STRATEGY FOR NUTRITION FOR EDUCATION AS A PRIORITY IN EDUCATION FOR HEALTH  
Brief statements by Dr. W.W. Yellowlees, Dr. Geoffrey Taylor, Mrs. Grizel Stanley, Mrs. Anne Jones-Haas, Dr. Ross Hume Hall.  
DISCUSSION  
11.45 OPEN FORUM  
12.30 SUMMING UP AND CONCLUSIONS  
Mr. Harry Walters  
In the chair: Dr. Kenneth Barlow, Chairman of the McGarrison Society.

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manages society through a faceless all-pervasive bureaucracy with a technocratic ideology, the dwindling employment prospects through the proliferation of giant corporations with highly automated equipment, and the need for stringent security to protect what is increasingly a vulnerable system. And what happens Amory Lovins asks, should a serious reactor accident occur when nuclear power is the prime source of energy? Could any country then afford to close all its plants down? Or would it have to keep going knowing that the credibility of the entire system would be in question?

The soft-option path, with its variety of choice and its multiple energy network avoids all the disadvantages of the hard option path, and it should provide employment at many different levels for those who find themselves in need. But, as Amory points out, the pursuit of the hard path now, will make the attainment of the soft path increasingly difficult, "both by starving its components into garbled and incoherent fragments and by changing social structure and values in a way that makes the

innovations of a soft path more painful to envisage and to achieve."

In Britain, where awareness of environmental issues lags years behind the United States and even countries of Europe, the battle lines between the protagonists of the two options are just being drawn. Ironically in forming Energy 2000, Arthur Scargill of the Yorkshire branch of the National Union of Miners has brought the brawn of coalminers out on the side of environmentalists against nuclear power. In retaliation the Atomic Energy Authority is arguing that coal is dirty, and environmentally contaminating whereas nuclear power is clean. Certain nuclear advocates are also trying to discredit the opposition as being of 'the penthouse proletariat', a group formed from the middle class with leftish views. According to Peter Beckmann, who has written *The Health Hazards of Not Going Nuclear*, the group fears its loss of status as others of lower class presumably attain similar standards. But Beckmann gives his fancies full rein, for he believes that the prime reason for the group's opposition to

nuclear power is that it does not understand it and hence is jealous.

What a delightfully ludicrous theory. Who is the group? Scargill's coalminers, or farmers up in Cumbria near to Windscale who saw their milk poured away in 1957, or even the Bishop of Kingston? Moreover Beckmann and those who now quote from him must bear in mind that ignorance and hence supposed envy were surely not the reasons why a number of highly qualified nuclear engineers decided to resign from their positions in the industry. And if we set out to destroy anything we cannot understand, then surely great works of art are more vulnerable than nuclear power, for their inspiration is far less comprehensible to the human mind compared with the rather mundane workings of a reactor. On that score it would not take me long to follow the gist of Amory Lovin's views on energy and reactors, but it would take me more than a lifetime to understand why I am moved by Moussorgsky.

#### THIS MONTH'S AUTHORS

**Manfred Siebker** was born in Bremen and studied physics, engineering and philosophy at the Universities of Braunschweig and Göttingen. He has worked in German industry and from 1959 to 1967 was with the Commission of the European Atomic Energy Community. At present he is a free-lance adviser and co-ordinator of transdisciplinary international research work. He is working on a major study of society in transition, and was a founder member of Ecropa, an organisation created to co-ordinate ecological movements in Europe. He is also a member of The Club of Rome.

**Eric Waddell** is an Associate Professor in the Department of Geography at McGill University, Montreal and was firstly a Research scholar and later a Visiting Fellow in the Department of Human Geography at the Australian National University. The paper published in this issue of *The Ecologist* was originally presented at the 25th Chemical Engineering Conference in Montreal in November 1975.



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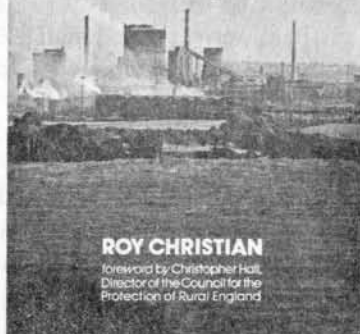
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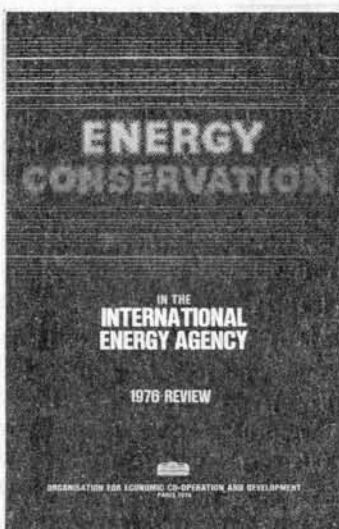


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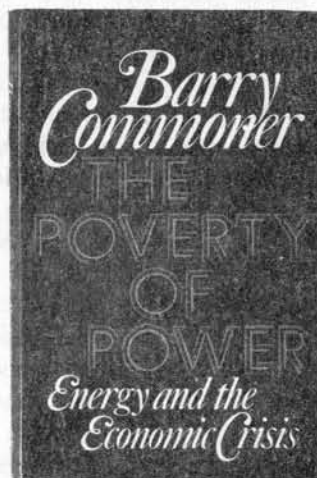
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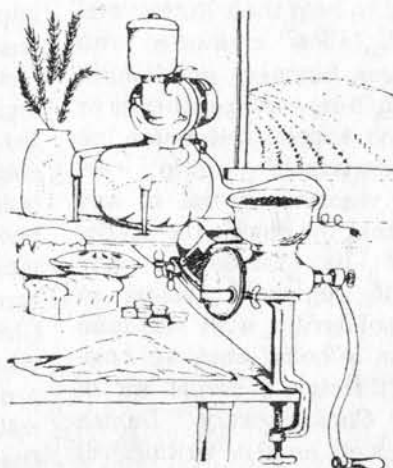
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## Books

### Christian Ecology

**IVÆKSTENS VOLD — ØKOLOGI OG RELIGION (AT THE MERCY OF GROWTH — ECOLOGY AND RELIGION)** by Ole Jensen, Fremads Fokusbøger, Copenhagen, 1976

Professor Ole Jensen is a Danish theologian who, unlike most of his colleagues, finds our uninhibited exploitation of Nature so "shameful," "outrageous," and "infantile" that he has written a devastating attack upon the growth and expansion ideology which characterizes the scientific, technological, and industrial civilization of the West. A Christian view of ecology is proposed based upon the Old Testament's idea of creation: the world, having been created by a transcendent God, is not only good, beautiful, and a source of joy and wonder, but its very existence makes us responsible for trying to prevent or eliminate that inscrutable natural and man-made suffering which we see as evil existing side by side with the good. In a divinely created world Christians are thus duty-bound to help their human and non-human fellow creatures with righteousness, kindness, gentleness, and respect. Here is no pantheism or animism, no angelic assistance, no divinely enchanted world: yet despite a vigorous denial of any divinity within the world, the author speaks of its sacredness and manages to convey a feeling of spiritual solidarity with creation based upon a belief that we have all arisen through a divine act of creation. Contemporary Danish poetry as well as the writings of Tagore are used as examples of a more truly religious attitude towards life than that of the so-called Christian West, which, following

Kant, Marx, and various contemporary theologians, condones the limitless exploitation of Nature because it is regarded merely as a source of materials for perpetuating man's well-being through continued growth and expansion. Ole Jensen's counter-arguments are intellectually and emotionally satisfying, including the undeniable fact that "it is monstrously base, crude, and brutal that we, in our expansion, freely exterminate animal and plant species which have taken millions of years to develop and which obviously cannot be recreated." All his opposition to our uninhibited expansion is in fact very well expressed, bringing to mind Peter Abbs' contention that "the writer of polemic is moved by a sense of urgency; he apprehends a state of affairs which horrifies him and seeks, with all the passion and intelligence he can muster, to change that state."

The book ends on a negative note with an appeal for a new tabu against further ruthless exploitation, which is certainly commendable as far as it goes. The basic ecological aim is however expressed as an obvious generalization called an "ethic of the least harmful," which means that since we cannot avoid making use of Nature, we should choose the least harmful ways of exploiting it. One would have liked something more specifically positive, as, for example, a fiery support of such unavoidable ecological goals as vegetarianism and the liberation of animals from scientific laboratories.

The book is nevertheless a truly important one and, as far as I know, theologically unique. It seems, in fact, inevitable that Western theologians will be forced to follow Ole Jensen in his passionate ecological concern for "what is not us." Nor is it in any way surprising that the book has awakened wide general interest here in Denmark, for it brings home to Christians and non-Christians alike the important truth that the ethical solution of ecological problems require much more religious-spiritual enlightenment than we yet possess. *At the Mercy of Growth* is soon to appear in German and should be translated into English without delay.

Catherine Roberts

### Dust to Dust

**SOIL AND CIVILIZATION** by Edward Hyams. John Murray. £2.50. Man is a product of the soils that feed and clothe him. Biologically this is self-evident, but can the concept be extended? Are advanced civilizations conditioned by the soils on which their agricultures are based?

Mr. Hyams believes the concept can be extended, that the way in which a particular culture develops can be traced back to the soils and topography from which it grew, as much a product of that soil as the trees and grass.

The argument is advanced persuasively, and supported by examples taken from all the world's major civilizations. On alluvial soils, renewed annually with silt deposited by floodwater, where agriculture is relatively easy, large and densely packed human populations can be supported. Egypt, Mesopotamia, the civilizations of the Indus Valley and the Hwang-ho were sustained by alluvial soils. Elsewhere in China, wind-borne loess soils, often of great depth, were similarly fertile provided water could be found in their drier climate.

So, in some places, a stable agriculture can be achieved. In other places, on other soils, farmers became too exploitive, taking from the land more than they returned until the crops began to fail. Around the Mediterranean deforestation triggered the slow but eventually irreversible process of soil erosion. This led some people to use the impoverished soil that remained to grow such crops as grapes and olives, on which they based profitable industries and became extrovert and adventurous. Where good soil remained, people were inclined to be more conservative. The most extreme example of conservatism and introversion was found in the Spartans, whose defence of their fertile lands led them to devote more and more of their time to military training as they sought to hold their slaves (the Helots) in subjection while protecting themselves from the incursions of neighbouring peoples. Their political system became increasingly unstable. Roman agriculture was based



originally on the small farm, owned and worked by one family. Later it degenerated into the equivalent of an industrial farming structure, based on large farm units, absentee landlords, and slave workers. It was Hannibal who wrought the change, and Hannibal was a Carthaginian. Carthage had no agriculture, lived entirely by commerce, and became ever more rapacious, plundering the lands of others. Hannibal did not take Rome, although he could have done so, and eventually the Carthaginians were defeated. The damage had been done, however, and after the Second Punic War in which the invaders were driven from Italy, farms were left so devastated that the older, more democratic and sustainable pattern of farming could not endure, and captured Carthaginians became the first slaves on Roman farms.

So Mr. Hyams expands on his theme, describing the American dust-bowl of this century, the soils and civilizations of Asia, China and the Inca Empire, until he reaches what he regards as the highest point in soil management in the high farming of North West Europe.

It is persuasive, but is it true? Is agriculture all-important or are we being led toward a simple, single-cause explanation of very complex events? I suspect this may be so, and certainly some factors are overlooked. The mighty Inca Empire was less secure than Mr. Hyams suggests. Indeed, its overthrow by a tiny invading force was due in no small part to the confusion caused by the civil war that was ending just as the *conquistadores* arrived. Nor is bad farming the only cause of declining crop yields or soil erosion. Climates change, and in the Mediterranean region and even in Oklahoma increasing aridity, which was not the fault of farmers, contributed to the failure of the grain farms.

Nor are ecological relationships really so simple as Mr. Hyams suggests. We may allow, for the sake of argument, that beyond the autotrophic level organisms are either parasitic or symbiotic in their relations with the primary producers that feed them, but there is a danger of reducing that intricate network of relationships that binds organisms together to a set of black and

white "goodies" and "baddies". If we accept the soil as a living organism, then sometimes man behaves toward it as a parasite, or a symbiont — depending on whether he depletes or enhances its fertility — but more often, I suspect, he is neither. Perhaps he is more like a catalyst, promoting changes by which he himself is not changed?

It is easy to be wise after the event. Ecology has advanced greatly in the quarter century since this book was first written, and its broad generalisations detract little from the thread of sanity and truth that runs unbroken through it, except for the scientific purist. It was one of the first books to draw attention to man's dependence on his natural environment and if, in doing so, it exaggerates the importance of the historical relationship between soils and civilizations, it does not invent it. The book became a classic of its kind, and we can see now that it deserved to do so.

*Michael Allaby*

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### The All-togetherness of Everything

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**INTRODUCTION TO ECOLOGY** by R. Dajoz. Hodder and Stoughton. Boards edition £7.50, paperbacks £4.45.

Is ecology a science or a philosophical system? M. Dajoz has no doubt that it is a science. Our ignorance of ecological principles has sometimes had disastrous consequences, and since man is as much a part of the fabric of the biosphere as is any other organism the elucidation of those principles may have philosophical implications, but the science must be considered in its own right, not clouded by values imposed on it. The world is as it is, regardless of what we would prefer it to be.

*Introduction to Ecology*, translated from the French by A. South, is more valuable to the serious student of the subject than its title might suggest. It is an introduction, in the sense that it devotes much space to defining its terms and to explaining step by step, the main ecological concepts, but it provides so many examples to illustrate each point, and describes them in such detail, that it becomes at once a first rate

text book and a valuable work of reference.

It begins historically, by tracing the development of the study of biological communities, and then launches into its main theme. The chapters lead smoothly from one to another, but the book divides itself informally into main sections. The first deals with environmental factors affecting organisms, such as climate, water, soil, food and then the biotic factors of intra and inter-specific interactions. This leads to the study of populations, their characteristics, fluctuations and the reasons for those fluctuations, so leading to the study of communities and ecosystems. Once the concept of the ecosystem has been established, and the main kinds of successions and climaxes described, it becomes necessary to discuss the movement of materials and energy. This includes ecological pyramids, food webs and the main biogeochemical cycles, and then energy transfer and productivity. From here we are in a position to review the major biomes, terrestrial and aquatic and so we are led to consider evolution and adaptation. Of course, man can and does alter the ecosystems in which he finds himself living, and so we are brought to the edge of the philosophical dilemma. Here the author urges caution. In the past, our effect on natural systems has been due to ignorance. Now that our power to affect them is so much greater, so also is our knowledge, and we owe it to ourselves and to future generations to evaluate very carefully the probable result of each innovation we make.

The book begins, then, by excluding rigorously the philosophical approach to ecology, only to return to it at the end, armed by now with a disciplined approach that can be applied to provide the information needed to make judgements. So our choices may be based on subjective values, but there is no excuse for them to be uninformed.

This is an expensive book. £4.45 seems a great deal of money to pay for a paperback edition of a little over 400 pages, but for anyone who wishes for a thorough, logical, lucid account of the science of ecology and of its significance in human affairs, it will be money well spent.

*Michael Allaby*

## Architectural Values

**THE EROSION OF OXFORD** James Stevens Curl. Oxford Illustrated Press. £2.95.

This book should be required reading for all who know Oxford, and more especially for anyone with a bookshelf of glossy tomes on the National Treasures, those books of carefully composed photographs taken in the early hours with no cars and just the right angle to exclude the ugly lamp-post, pylons and road signs, or the GPO Telephone Exchange.

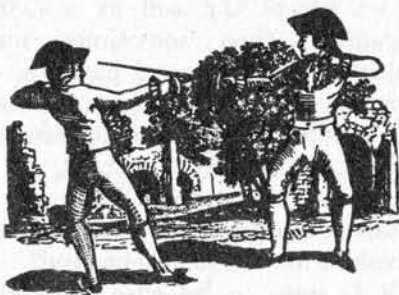
The pattern of erosion is finely documented, especially the alarming acceleration in the last decade — the destruction of whole communities to make way for central car-parks, shopping precincts and offices; the laying out of vast wind-swept and featureless housing estates dominated by the needs of the motor car — a pattern of human scale subverted by cheap materials, unco-ordinated design and lax controls.

The University itself, protected as ever by politically active dons, has not gone totally unscathed. The beauty and style of its undoubtedly humanistic early architecture have served to restrain excesses and to upgrade the parsimonious, but in the science block there has been an almost symbolic disregard for human scale and harmony, Biochemistry's 'skyscraper' and the monument to Nuclear Physics both dominate and disrupt Oxford's famous skyline.

"his book is a well documented plea for humanistic architecture, but what are 'the lessons' and 'wider implications' claimed? In somewhat 'ivory-tower' fashion it is calling attention to a process that has already ripped the heart out of our finest cities.

If there is a lesson to be learnt, it is that the author, a Town Planning Consultant, still feels constrained to point only vaguely at 'the-powers-that-be'. He gives us no insight into the decision-making process. Why, for instance, was the new development next to Pembroke College approved? It will be the biggest Marks and Spencers in Europe: a scale that has little to do with lack of taste, but a lot to do with political powers-that-be.

Peter Taylor



## Letters

### Thinking About the Unthinkable

Dear Sir,

I read your publication "*The Ecologist*" for the first time last month (Jan/Feb) and I would like to congratulate you on publishing such an unusual article as Thomas Merriam's "*The Disenchantment of the World*". While every kind of direct warning and challenge about the state of our environment is needed to combat pollution, the most fundamental change will have to come through a change in Man's understanding of himself. The unusual feature of Mr. Merriam's article was his indication that human consciousness itself has evolved even over a biologically short period of time.

Thomas Merriam observes a past view of the world which he refers to as "participation", in contrast to our modern "detached" consciousness. He suggests that: "the penetration of the material world by spirit leads naturally to symbolism as a means of knowing. Natural, perhaps, only for the already detached mind? Symbols by their very nature are part of the detached way of thinking.

If the detached "bias" is removed, quite a different view of the past can emerge — an uncomfortable view for the modern mind but one which needs consideration. For its consequences turn our usual way of viewing the past upside down — but then some kind of revolution in our thinking is demanded by our predicament.

Instead of a "participating" consciousness which uses angels, faeries, spirits etc., symbolically to make a dead "real" world into a warmer and more personal one, consider for a moment the world as one in which such phenomena are objective realities which weave on objective spiritual existence behind the material tapestry of the world of the physical senses. A "participating" consciousness then becomes one which directly perceives these realities and to a great extent identifies with them and experiences directly its dependency on what they do. Its sense of individuality would be much less developed than our own.

Many psychologists would agree that a baby experiences himself and the world as one and starts to achieve the experience of self and not-self in, for example, the discovery that his toe and his toy feel different. The child extends this separation — so that what was a complete identification of self and parents, self and world, becomes an inner and an outer, a self which develops through a progressive detachment from all those relationships on which its ex-

istence depends.

A crisis is reached in adolescence. Here, an acute awareness of self is maintained vigorously and rather insecurely by an extreme rejection of all dependencies (parents, for example!) Maturity will only follow when this sense of self is secure enough to accept and respond again, freely and objectively, to those with whom its identity was formerly merged. It can then both recognise them and retain a sense of individuality.

If this picture of child development is used historically one could recognise that modern humanity is in its adolescence. It could be suggested that it was historically necessary that man should lose his awareness of the objective spiritual world around him (on which his existence objectively depends) in order to achieve his individuality. The use of symbols would indicate one of the last stages in such a separation. There would then seem to be two extremes ahead as there are for the adolescent: One would be for mankind to give up his sense of self and turn toward the mysticism of ego-denial (e.g. the hippy); the other would be a way which leads to manipulation, gross technology and egotism.

The middle way to adult maturity is difficult enough to achieve, the middle way for humanity as a whole must be more so. Perhaps, such a new consciousness could be called "objective participation" — an honest and conscious attempt, based on observation not faith, to form a direct relationship with those spiritual realities with which the Self was once immersed and identified. As Thomas Merriam says — "angels . . . are inconceivable in a materialistic world". So a view which seeks to remove the detached "bias" is likely to be rejected out of hand, even with considerable hostility. Such reactions are also those expected in adolescence — maturity comes through contemplating the unthinkable with an open mind.

Yours sincerely,

Graham Kennish

Crookthorpe

Glos., GL4 0UN.

### The Cow — Thoughts for Consideration

Dear Sir,

Following the debate on vegetarianism in your December 1976 issue I send this thought for consideration.

At the time when protection of the cow from slaughter became a religious idea, India still had vast forests and grazing land. These areas also contained large numbers of meat-eating animals as well as hunter-tribesmen, all of whom helped to trim the cattle-herds of weaklings. So the herds were strong, healthy and well fed. Such conditions no longer exist, and today the majority of India's cows are pathetically underfed weaklings. This means that if these cows are to be protected by law, then the law, to have any moral meaning, has got to guarantee that they are not killed by deliberate neglect and starving. But to enforce such a law is just about impossible. How can it be proved that the neglect and starving are deliberate and not because the villagers themselves are half starved and unable to support worn out cows along with the productive ones? And if that is so then the Government is duty bound to feed the cows it has protected by law.



In order to illustrate my meaning more clearly I will describe my experiences when in charge of the Government Centre in Pashulok for old and disabled cattle. We received worn out animals, both cows and bullocks, in various stages of neglect and malnutrition. I particularly remember a big consignment sent by train from an orthodox dairy. Of course this dairy did not have its worn out cows slaughtered, but it certainly did not love them. Though the hot season was in full swing, no provision had been made for watering the old and enfeebled animals during the journey. Some died on the way, and several others were too weak to walk when removed from the cattle trucks, and had to be brought to the centre in lorries. The dying cows we laid out on the ground and the others we kept alive by feeding them on finely cut hay and concentrates. As they had always been stall-fed, and many also had bad teeth, they could not manage to nourish themselves in the grazing lands. When any one of these cows became too weak to stand or even sit in the ordinary way, and finally collapsed on its side, the problem was how to prevent it from getting sores (bed-sores as they are called for humans.)

Not many cows were sent from the villages. This was probably due, to some extent, to the affection many a villager has for his old cow, and to the distrust all villagers have for Government-run institutions.

It became clear that, to cope with the problem on the lines of this scheme, would be an impossibility. No Government could run big Animal-Husbandry-Centres all over the country for enabling neglected animals to die a 'natural death'. I have heard of, but not seen, some private centres for old cows. Apparently such centres could be kind, if a loving, knowledgeable person was in charge, but otherwise they could be hateful, and in any case they could deal with only a few local animals.

Then what is the solution to this problem? Total prohibition of Cow Slaughter if rigorously enforced would not save the cow from suffering, nor from slow killing by other means. Also to legislate for the cow in isolation makes no practical sense, and smacks too much of orthodoxy. But to legislate for her and her progeny is a very urgent national need. Naturally I am not advocating total prohibition of slaughter for the whole bovine race — it would create chaos. I would suggest something on the following lines:

- 1) Prohibition of the slaughter of the cow and her progeny so long as they are capable of drawing the plough, which includes the cow herself who is widely used in other countries for ploughing etc. where not displaced by mechanization.
- 2) Prohibition of the export of live animals.
- 3) For animals that are worn out slaughter of a merciful kind to be permitted.
- 4) Strict supervision of slaughter houses and the handling of cattle in transit.

My mention of the cow being used for ploughing etc. will, of course, shock many people. Well — it is an accepted fact in rural India that the best of everything goes to the bullocks, because they plough, and the cow has to do with what is left over. If she also did a little ploughing, she would immediately get better food and attention. I have seen many happy, healthy cows working in Europe and they have comfortable harness for the purpose.

Now that the disadvantages of mechanized

agriculture are beginning to be realized, it is discovered that bullocks are in desperately short supply, yet nobody will think (will dare to think) of letting the cow come to the rescue. Even sterile cows and cows with extra long dry periods who are starved or quietly sold to the butcher must not be put to the plough.

It is time to think over afresh the whole question of the Indian Cow if she is to be saved. Yours faithfully,

Mirabehn  
Austria

### Vinoba on Cow Slaughter

Dear Sir,

I was interested to read the very detailed discussion on vegetarianism and ecology in your December issue, just recently received.

In this connection, one point strikes me very forcibly. It seems to me that the only two alternatives which were discussed in detail, of butcher or extinguish and mechanise, do not apply to half or perhaps to two thirds of the world. In the tropics and sub-tropics zebu (humped) cattle have been universally used as draught animals for ploughing and transport. The triple use of cattle for milk, draught and manure is the reason for the place of cow worship in Indian culture. The cow was really the 'Kam-Denu' (Fulfiller of desires) and venerated as such. Later of course with increasing cattle population and decreasing pastures she is frequently in a sorry plight. This was the reason why Gandhiji adopted 'Gau Seva' (service of the cow) as a main item in his 18-point constructive programme. It was no mere orthodox sentiment it was a real practical economic point.

Last year, Vinoba took up the issue of cow slaughter with Government. In the Directive Principles of the Constitution of Free India, cow slaughter (which includes bullocks and calves) was to be banned. This was however a provincial subject and this principle had not been fully implemented or adopted by all states. Vinoba was so much perturbed by all these years of delay that, although as a rule he is strongly opposed to fasting on public issues, he was planning a fast unto death on this subject. You will be interested to know that the Christian and Muslim communities, both of them meat-eating, were almost unanimous in support of his demand, for the cow is a 'Kama-Denu' regardless of creed or caste, and is an integral part of Indian agriculture.

In the first place, the state government (Maharashtra) resorted to repression, but was pulled up by the centre, and after frantic discussions a compromise was reached and the fast was postponed.

Vinoba has now given definite guide lines for gau-seva.

#### 1. Propaganda.

On the 11th of every month, prayer meetings to be held to propagate ideas regarding gau seva.

#### 2. Pledge.

A pledge to use cow's milk and other products, in preference to buffalo's milk, except in such areas where the buffalo can be used for draught, owing to suitable climate. (In most parts of India it cannot.)

#### 3. Integration of cattle and land

The cow and the land cannot be separated. Every farmer should keep a cow, and every cow-herd should own some land.

#### 4. Care of aged cattle.

In every village the village council should run a pinjrapole (cow shelter) in which, in exchange for their fodder, all the waste products of aged cattle while alive or dead, should be utilised. Methane gas plant, tannery, bone digesters etc. should be associated.

#### 5. Universal contribution.

Every family should subscribe five pice per day (rs. 18 p.a.) for the 'Cow's morsel' (gau gras). Half this amount will be spent by the Gau Seva Sangh (Cow Service Society) on directly providing fodder for cows one quarter on their monthly bulletin 'Gau Gras' which will be sent free to subscribers, and one quarter on the Central Office.

This type of programme should be a 'must' for all tropical countries, for the revival and expansion of agriculture.

Some years ago I read that zebu cattle had been imported into America as an experiment, but I have not seen anywhere the result of the experiment: It might be interesting to follow this matter up. Possibly experts in animal husbandry could throw some light on why horses are not used in agriculture in the tropics, and (apart from the question of the hump, which may not be insoluble) cattle are not used in temperate climates.

Although in present circumstances Vinoba looks upon the care and proper use of cattle as being of paramount importance, he also believes that unless the human race accepts the principle of self-control in every sphere of life, of satisfaction of all through the minimum (voluntarily) rather than the fulfilment of high desires of the few (Referred to in my previous letter on birth control, which however has not been published) there will come a time when we shall have to abandon cattle culture, dig up our railway lines for crops, become universally vegan or cannibal. He suggests that the time will come when our descendants will be as horrified to know that their forebears drank milk, as the orthodox are today at the suggestion that the Rishis (sages) of old, ate meat! So he is acutely aware of the ecological pressure, and faces the consequence which may be expected to accrue unless the world accepts the principle of self-control and the limitation of desires.

Yours faithfully,

Sarala Devi  
Him Darshan Kutir  
Pithoragarh,  
India.

### Same Shoes?

Dear Sir,

R.D.B. Williams (Letters, *The Ecologist*, March 1977) flinches from his own logic. How can it be any easier to 'compete' with the diet of bread and circuses from within a party rather than from without? Each splinter group of ecologists must silently hope that one of the others is the first to incur the electoral liability of advocating what they themselves believe in. The growthists must always outbid us in purely

material terms, and we are reduced to the querulous-sounding reply that such confidence in human ingenuity is misplaced.

No, the real answer is to change the terms of reference, and that can only happen through widespread public discussion. This is a pair of shoes which a big party could only put on after they had worn them for a while. In the four years since the Ecology Party was founded, less than four hundred have accepted this logic. Meanwhile the thousands (seven thousand Conservation Society members, for example) who did not, have presumably spent that time 'infiltrating the mainstream' without noticeable effect, as witness the need to claim the Windscale postponement as a victory. At the enquiry someone will say 'jobs', and that will be that. In view of the urgency can the Ecology Party strategy now have a four year trial please?

Mr. Williams recognises that the chasm between ecology and 'wealth creation' goes deeper than arguments about sharing the cake, yet he remains in trenches dug to fight an old enemy, and which can only be used to fight his new friends. In fact, a fusion of 'left' and 'right' may well be much easier than is commonly supposed. I am currently urging the merits of an ecological ideology based on such a synthesis within the Ecology Party, and for ten pence plus postage I can supply a fourteen page exposition of this to anyone interested.

The Conservatives Mr. Williams is looking for are there all right: plumbers, electricians, small farmers, property repairers, self-employed craftsmen of all kinds, but they will not lightly abandon their strange allegiance to the Multinational Party, and I doubt if he will reach many via *The Ecologist*. When, or better still,

before he has recruited them, might I suggest a conference of ecological Conservatives, Liberals, SERA and the EP to explore our mutual interests? Copies of this letter to each.

Yours faithfully,

Clive Lord,

National Secretary, The Ecology Party,  
Batley,  
West Yorks.

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