Reviews

ergy, Man and the Environment. Papers ven at an international symposium, bruary 1972 (Gottlieb Duttweiler Insti- te, CH-8803 Rushlikon-Zurich, 60 Sw. .).

This book comprises photocopies of n papers of varied length presented at e above symposium. An adequate open- g paper by Dr. E. F. Schumacher, Energy and Man" discusses the current yth that "the problem of production" as been solved and that, in fact, con- picuous industrial success has only been chieved so far by treating capital—the orld's non-renewable resources—as in- ome: something which business owners ould not do individually with their own apital stock but which, together, they are ll doing. Arguments for and against uclear power are presented by Sherman . Knapp and Dr. John Gofman together ith some experiences with AGRs in this ountry by Dr. John Francis. With the xception of a paper by Dr. Shivaji Lal in hich the jargon was often incomprehen- ible all the papers are readable and cover ost aspects of the energy field. Other apers include "Energy and the Hydro- phere" (salutary) by Prof. W. A. Mardy, Energy and Business" (pulls no punches) y J. Esposito and two of UK relevance y D. H. Broadbent (short) and Richard ailey (long and informative).

C.H.

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TOWARDS SURVIVAL 19

A Journal of Sustainable Policies

JANUARY/FEBRUARY 1974

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Editorial

Margaret Laws Smith

Since the last issue of *Towards Survival* the first severe checks to a policy of growth from the shortages inherent in the limitations of the earth's resources have been felt, and acknowledged by the present Government in an almost exaggerated way. The American government had become aware of the restraints so that the exhaustion of its own oil resources were about to impose on industry last Spring and now, through the Arab-Israel war, the Middle East suppliers have become aware of their power to raise oil prices, and the necessity for conserving their own resources to support their own economies for as long as possible.

Economic growth in the form of an increase in production of more and more consumers' goods is temporarily in abeyance as an object of government policy. The Government's emergency financial measures, published on 17th December, 1973, aimed at lopping £1.200 million off total demand in the year 1974/5, mainly through cuts in the public sector. The chief economic objective in the immediate future will probably be the development of new energy supplies, new coal seams, north sea oil and atomic energy. These will all require capital investment.

As oil prices rise, paying for imports will become more difficult. As population continues to increase throughout the world, food prices will also continue to rise. To export sufficient manufactured goods cheaply enough and attractive enough to pay for our oil and food will become more and more urgent, and already we can see in *The Times'* demand on December 19th for twenty *billion*, not million, pounds worth of new investment to make British industry fully competitive in world markets the way one cry will go. Thus what we may expect is growth in another form. High investment in energy production and export industries with the hope that ultimately both will be so successful that growth in consumers' goods for the home market may be resumed.

We may expect conservation policy to go to some extent along with government policy, but basically to oppose it. The rise in food prices will cause everyone to become more concerned with home food production and the best use of land, but we shall diverge more and more on the question of how fast we are to use up our coal resources, on how far restraints on other investment are to be made if necessary to promote that

in north sea oil, and how far we are to risk dangerous pollution of the environment in the next century by the development of atomic energy without adequate long-term protection against radio active wastes.

Concern for exports and the increase of energy resources are being and will be increasingly presented as being in the interests of the community. But what sort of community? A skeleton economic organisation on which this future community is to be built has already been laid down by the present Government in the Industrial Relations Act, in Phases I, II and III, and in the Pay Board.

The result of all these is to limit the extent by which workers are free to bargain with their employers. It is probable that this policy will be continued more and more. The rising costs of energy alone are going to cut down the demand for cars and electrical appliances in the free market. Unemployment will increase in those industries. More employment will be offered in mining, in railways, and in capital development for north sea oil and atomic energy, but free bargaining by workers in these developments will be restricted.

Survival depends as much on the institution and development of a freely self-regulating society in which each individual can play his part without compulsion or forced submission to the will of another as it does on the careful conservation of all natural resources. A regulated society in which workers are expected to obey rules for employment which they do not have any opportunity to assist in making, or in making the policy which lies behind them, will have strains and tensions from which it breaks down. The resulting social chaos will make the wise regulation of scarcities impossible to achieve when finally those scarcities have so far increased that regulation is seen by everyone to be necessary.

A policy to create a basic organisation of society which will prevent the renewal of growth, make possible the employment of all seeking and available for work, and the wise and considered apportioning of energy and other scarce resources between the needs of the present and the future is threefold.

In the first place it requires the stabilisation of the total supply of money, and a determination on the part of the controlling complex of the Government, the Treasury, the Bank of England, and the rest of the banking system, that no increase of credit shall be granted either for the creation of additional equipment or consumer credit beyond the amount necessary to put everyone in employment.

In the second place it requires an employment and re-employment policy which will make jobs available for everyone. Anxieties about unemployment which are bound to come with the inevitable contraction of the car and consumers' goods industries as a result of rising energy prices are going to be a very powerful force behind the great pressure which is building up from other sources for intensified exploitation of remaining energy resources. A period of widespread unemployment while plans for energy exploitation are being developed will make workers

and their unions more ready to accept employment in mines, national transport and energy services, and the development of north sea oil on the government's and employers' terms.

Thus it is absolutely necessary to provide alternative forms of employment, and to create jobs which will be a benefit to the whole community from the use of all its available labour without the rapid exhaustion of its resources of energy and metals.

This is where other policies of conservation work in with the necessities of economic stabilisation. The need to grow more food demands a firm policy of restraint on the use of any more agricultural land for any other use whatsoever, motorways, housing, school, or industrial structures of any kind. But the increasing price of petrol will work in with this since people will be more reluctant instead of increasingly eager to move out of the towns where the jobs are to life on a new estate in the green fields.

Thus the immediate object of a survival policy must be to call for a prohibition on the use of green land for housing and industry and the redevelopment of the scarred and wasted industrial areas for housing and industrial development which does not press heavily on scarce resources.

Scarcities of all kinds have suddenly become something we have to start dealing with now, instead of being a prospect in the more or less distant future. So we have to accept a social and industrial capital and equipment we have got now, and use what we have got, and build our future within the limitations it sets for us. We cannot go on ripping it to pieces and starting afresh. This goes for social life as well as industry. Thus we have to accept the existence of our towns, and housing and factories, as we have them now as the basis of our lives, and consider how we can improve them, and make a liveable and happy life for ourselves within the boundaries they set us. This means that we must use our labour lavishly where necessary to maintain and improve existing housing instead of knocking it down; that we must build new houses and make them as pleasant as possible on the odd left over, often wretched and dirty little bits of ground at the back of towns like Manchester.

Wherever there is a river in a town priority should be given to a long stretch along its banks for gardens, for sitting places and playing and swimming places, to provide for the need for relaxation by living water which urban populations everywhere find necessary. Whether Sir Alistair Hardy and Elaine Morgan are right in their contention that many of the characteristics which make us human beings developed during a very hot period when our evolutionary ancestors took to the water's edge and spent most of their time body in and head out of the sea or not, urban man has shown that frequent returns to such behaviour is most conducive to his mental and physical health.

What will happen to the existing bungalow developments in the countryside? They will provide the housing for an increasing number of agricultural workers who will be necessary to produce more food.

Thus we want an Environmental Reconstruction and Employment policy which will require much preparatory work by local groups who can examine their own urban areas, and prepare numerous small schemes which can be integrated into larger ones. It also requires re-thinking about water and sewage and health services. Shall we always have energy to spare to collect water in mountain reservoirs and pump it to the towns? Shall we always be able to neglect the value of fertilisers and gases which could be produced from urban sewage? Should not these fertilisers go back to the land? A Royal Commission should be called for and set up immediately to consider water and sewage re-organisation as the basis of urban re-habilitation.

Thirdly, if you end inflation and growth but embark on a policy of full employment you have got to have an incomes policy created by discussion between workers in different industries, between workers and manager, and between employed and non-employed groups to determine the right differentials between them.

So long as an increase in money and total demand continued the claim for a relative rise could be settled by an absolute increase, but if the total of all incomes is to be kept stable, then the only way in which one grade or group can get more is for some other group to get less. So that the basis of a stable economy must be the preliminary agreement of how much more or less is each worker or grade of worker worth compared with the rest. What is the place of each on the total scale, what is the lowest that is reasonable, and therefore what is the highest that is allowable?

Wage negotiation between workers in different industries should go with an increase in workers' control within industries. In a stable economic situation the importance of management will decline, since so much of their work is concerned with the expansion of markets, and become solely concerned with matters of the co-ordination of processes and activity. Discussion and regulation of rewards between productive groups could be the beginning of a self-regulating economy which would counteract the oppressive tendencies of too much government control of industry from above.

These three aspects of policy are the sides of a triangle. Each is essential to the shape of the whole and the position occupied by the two others. Two sides of any triangle without the third just flap. Put in a third side and the other two are held rigid, and a stable form is created. If you have a stable money supply and a policy of full employment you must have an incomes policy to determine how the total unchangeable income is to be divided.

A stable monetary policy, a conservationist policy for environmental re-employment, and a self-regulating incomes policy with a great increase of workers' control are the A, B, and C of the start of a survival policy. They may be symbolized by a triangle with sides A, B, and C.

There is an old saying "as right as a trivet". A good symbol for a policy of economic stability.

DOMESTIC NOTES

Future Publication I must apologise for the delay in January's issue and its appearance as a joint issue with February's. This was caused by a lengthy bout of influenza. However, I have also had to consider very carefully future plans for the journal. New subscriptions—although coming in healthily—are unfortunately not up to the level required to sustain TS in its recent format. So I am going to have to compromise by reducing the number of pages and the occasional publication of joint issues. I hope, therefore, that readers will bear with this situation. With this issue a large proportion of our subscribers are due for renewal and the results will have important financial consequences. My main concern is to survive (and thrive) during 1974. But, as already said, new subscriptions are coming in steadily and there is no reason why we should founder if you can continue to introduce this journal to potential subscribers.

Finances At the time of writing I am still discussing last year's Balance Sheet with the Income Tax office but it will be printed when finalised. I will mention, however, that we made a sizeable loss and this is likely to be repeated when we reach the end of our second financial year in July. Due to changed circumstances, however, the journal will soon have to completely stand on its own feet financially and I very much hope that readers will continue to help with donations. By the way, I am grateful to those who ask me not to send acknowledgements: this saves a good deal of time.

Since the plate-maker appeal (which I have since used for ordinary production costs) further donations received are as follows:

(August to October) MJH £5-00, CTBP £0-20, DH £2-00, NJC£3—20, AD £5-00, UL £0-65, PN £5-00, RH £0-50, WCO £20-00, AEM £5-00, PGW £1-00, IUI £2-00, EGWM £1-00, PEW £1-00, LMC £2-00, CMD £ 0-60, SIM £1-00, JRR £3-00, DC £5-00, PGB £2-00, NMDB £1-20, HJC £0-30, FSC £0-25, JBW £1-00, IRB £5-00, MFGS £0-10, KDH £50-00, AP £0-20, JMP £2-50, REB £10-00, LN £1-20, BRP £8-20, GFK £2-00, HM £5-00, AF £5-00, CH £0-40, JAS £3-00, APL £7-50, JAK £0-20, PBMacD £1-00, LB £1-00, CH £1-00, KEB £100-00, RGR £6—20, PRD £3-00, GHR £0-50, BJI £1-00, KDH £0-20, UGT £3-20, BBM £0-20, MFV-S £1-20, WEE £2-00, JHT £1-00, JG £5-00, BEE £5-20, NJB £8-20, DHS £1-00, JDL £2-10, CSH £2-09, GSB £1-00, JW £1-20, AHD £5-00, DK-C £0-80, RGC £5-00, £2-50, DTM £1-00, Anon £10-00: TOTAL £339-79; (November) JAW £0-75, AHB £10-00, TCH £3-20, FPUC £3-80, ABW £1-40, HGI £10-00, MG £1-20, RWB £1-00, Anon £20-00, OB £5-00, DPW £4-00: TOTAL £60-35; (December) JEA £2-00, HR £5-00, RAC £1-88, MJH £1-00, DRAS £10-00, AD £5-00, DMT £3-00, CFS£1-20, AF £2-00: TOTAL £31-08.

Most of these donations were made towards the TS Booklet and will not be used for general production expenses. The Booklet is still being drafted.

Information for Survival Digest Dr. Kenneth Barlow and I have amicably agreed to part company and very soon his **Digest** will appear in the **Ecologist.** (£4-00 p.a., 73 Molesworth Street, Wadebridge, Cornwall). If any readers have subscribed to **TS** for the sake of the **Digest** alone then I shall be happy to arrange for the balance of their subscriptions to be transferred to the **Ecologist.**

Supplement (Evidence to the M40 Public Enquiry) All our stock of the November Supplement have now been sold but further copies may be obtained from **Resurgence** (price 20p post paid, 275 King's Road, Kingston, Surrey). Despite the cutback in Government expenditure announced in the mini-Budget further motorway enquiries are still being planned and readers who propose objecting will find this Supplement useful.

Future Activities So far, TS has not been directly associated with any particular projects although, of course, we have supported many environmental projects sponsored by others. I have felt that we needed to wait until "our own thing" emerged from the discussions in our pages.

For two reasons this time has now come. For one thing, many of the forecasts we have made in these pages have largely come true in the last few weeks. Resource shortages have come upon us extremely rapidly and even if we recover from the short term power crisis in good heart—as we all surely hope we will—we are likely, in 1974, to be at the beginning of a post-growth era. The second reason is that the economic policies of this journal (see this month's Editorial) have reached an important stage. I am sure that it is opportune for us now to take a more active interest in propagating our views on incomes policy, stabilised money and credit supply, and new forms of long term environmental employment.

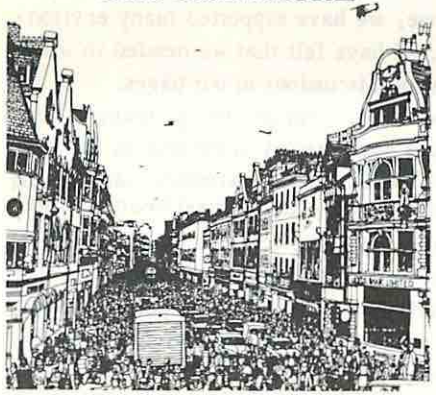
On the first point a large number of people, and usually not conservationists, are already persuaded that some voluntary process of national pay relativities must be evolved. We hope, therefore, that readers of TS can help here through their trade unions, professional institutions and other channels.

The policy of stabilised total monetary demand is not so popular. The only public spokesman I am aware of who has spoken much about this is Enoch Powell. Our reasons for proposing a stabilised money supply are, of course, somewhat different from his and it would be unfortunate if his name were the only one associated with this policy. So as far as possible, through constituency organisations, by letters to MPs and in other ways we must try to spread the necessity for this policy.

On the matter of environmental employment there does not appear to be any suitable channel open to us and it is here that I feel that TS can make a particular contribution. To this end a small study group is being formed, provisionally entitled an Environmental Employment Working Party. I am hoping that this will prove to be a vigorous and imaginative project and that it will in due course spawn many other initiatives of a similar nature. Progress will be reported in future issues of TS.

Keith Hudson

POPULATION GROWTH IN OXFORDSHIRE



A memorandum to the Select Committee on Science and Technology prepared by the Oxford Branch of The Conservation Society.

Copies at 25p. post free, or 15p. per copy for orders of over 10 copies, obtainable from:
Mrs. Jean Dearnaley,
11 Clifton Drive,
Abingdon, Berks.

A shorter version at 5p is also available.

Poetry

NOISE INVASION

We hear but fail to listen
where decibels exceed themselves
till noise is
photofinished first with speed
where youth discards its senses in
the discotheque
where habitats and plugged and
switched to super

sound
where loud is good—and soft is
rude
where transport makes us cower
where aerojets exhaust their lungs

noise is a natural thing—as is music
there is a thin dividing line
forte and piano are interpreted
according to the
whims of our dictators
noise causes deafness—causes
blood
disease—kills
let us remember the backcloths of
silence.

Jenny Johnson

FOR LITTER'S SAKE

containers marked EASILY
DISPOSABLE
float permanently on pools.
letters proclaiming perennial loves
are too temptingly brittle to keep
from the fire.
we retain what is useless—
destroy the essential.
who knows what—to whom—
means
one or the other?
might not a container be fingered in
warm surroundings,
or a letter—profound though it
looks—
tender shallows of affection?
if we laid no hand on possessions
of others
our land would be littered.
a reason for litter—perhaps.

Jenny Johnson

THE LATEST BATH TRAFFIC SCHEME

This being the age of the cheap,
nasty, similar-
sounding substitute, the Age of
Dream
Topping as opposed to real
country cream

I suppose it is only to be expected
that
even our planners should now
promote mobility
at the expense of nobility.

Everard Flintoff

Water: A Valuable Resource

R. I. Odell

"Water, perhaps most previous boon of men,
Is made of hydrogen and oxygen:
Mixed in the ratio of two to one
These gases are the fount of life and fun".

ıe. late A. P. Herbert's humorous verse exemplifies one of the many ;ources crises facing the modern world. The water provided by nature the hydrologic cycle has long been inadequate to meet demands. The ervention of technology was necessary from the moment that man took cultivation. Water wheels, pumps, pipes, aqueducts and drains were st generation technology in the Indus and Nile civilizations in 3000 BC. As populations have multiplied and standards of living have increased, mands for water have surged. Modern life only accentuates the conflict- needs we have for water. The greatest anomaly lies in the fact that we rivers for both abstracting drinking water and transporting sewage and lustrial effluent. When amenity and environmental considerations such fishing, sailing and the aesthetic appearance of the countryside are ten into account, the "fount of life and fun" is in danger.

Making people aware of the need to conserve water should be high on list of priorities. Water is not regarded as other resources; people nnot take seriously the idea of water shortage in Britain which is ditionally viewed as a wet country. But this is a myth; in Europe, only alta has a lower mean rainfall. In addition, there are the perversities of ture to deal with—rain invariably falls in the wrong place at the wrong ıe. In Britain, this means that the wettest areas are those furthest from centres of population and it is during the summer months when water ıeeded most, that it rains the least.

It is still not universally realized that water is far from being an infinite mmodity. It is strictly limited to the 2% freshwater component of the al water resource and is circulated and then recirculated within the drologic cycle. The technical ingenuity which enables water to be stored provide a reliable supply during dry seasons is not generally appreciated. Up to the mid 1950's in Britain, water supply was relatively trouble-free d new pipelines and reservoirs were commissioned as required. But the ergence of an environmental lobby questioning the necessity of flooding ge areas of land for water storage together with the re-organization of water industry itself has slowed down new development whilst demands water continue to rise at about 3% per year.

Finite resource

The growing sophistication of modern life makes dramatic demands on ter from all aspects. The average European home with its essential

domestic consumption runs at about 30 gallons of water per head daily. While the demand for water to service kitchen aids, such as dishwashers and garbage grinders, to water the garden and to clean the car (or cars) is rising rapidly. This standard of living is only made possible by the output of manufacturing industry which, in turn, is supported by the generation of electricity. To complete the picture, there are the water requirements of agriculture. All this adds up to an enormous thirst of 2,128 million gallons a day.

It used not to be fashionable to think of sewage in the same breath as water supply, but the fact is that 99·9% of all water used is disposed of as waste and re-enters the water cycle. What this means to the health of the community was highlighted in 1970 during the industrial action of the municipal sewage workers. It is important therefore to think in terms of water as a total resource and a finite one at that.

It has been estimated by the Water Resources Board that Britain's water supply, on the basis of current trends, will need to double by the end of the century. This prediction has been taken very seriously by the government and the pressure is on the water engineer to define the options available. While it does not help to talk in crisis terms, it should be understood that the problem is not just for the future—it exists now. The dry summer weather of recent years in Britain has led to restrictions in the use of water and the threat of rationing in some areas. Stand pipes in the streets of North Devon towns during the summer months are now an accepted fact of life.

The problem may be defined briefly as the need to get more water of adequate quality from existing resources. But herein lies the difficulty, for while there is an urgent need to make better use of every water source, we are at the same time hazarding them with various kinds of pollution. In addition to the known industrial discharges which have contaminated a fifth of Britain's rivers, there is the ever increasing danger of accidental pollution. The road tanker which crashes and spills a load of toxic chemical is not just a nuisance to other road users, it constitutes a danger to groundwater supplies if the contaminant gets into the water courses.

It is no exaggeration to say that the economic wealth of the industrial nations has been obtained by disposing of waste products at virtually no cost. The easiest way has hitherto seemed the best. The discharge of gases to the atmosphere and of liquid and solid waste on land and into the rivers has been reckless. Now there is a very unpleasant reward to be reaped—one nation's waste becomes another's poison. Put another way, the effluent from German industry discharged to the River Rhine today becomes the Dutch Water Engineer's problem tomorrow. In Britain it has been reliably estimated that as much as 25% of water drawn for supply comes from sources that are frequently or continuously polluted.

The 1973 Water Act will put into effect the government's proposals to recognize the water industry. Ten all-purpose Regional Water Authorities

vill be set up to co-ordinate water supply, sewage disposal and effluent. They will also be responsible for prevention and control of pollution to ivers and estuaries and the use of rivers, canals and reservoirs for amenity nd recreation purposes. This is a long-awaited rationalization which epresents an understanding that clean and dirty water are both parts of single resource and are ecology.

Within this new arrangement will be the planning and research apability which will have to face up to the challenge of meeting the nd-of-century demands for water.

)uantity

Mounting pressures against some of the big reservoir schemes have nade water engineers think about alternative methods for storing the uge quantities of water required to meet demands.

The Thames Conservancy is already experimenting with the recharge f underground chalk. Vast reservoirs or aquifers exist underground, and ondon, for example, is surrounded by chalk hills beneath which lie these quifers. The idea is to keep these stores topped up by pumping water into nem during the winter so that it can be stored for use in the dry summer nonths. The winter rains will be the great provider and the method aims to ven out the seasonal variations in river flow. Moreover, the chalk acts s a natural filter and extracted water requires very little subsequent reatment.

Another scheme under consideration for storing water is the barrage nd a number of estuaries have been looked at as possible sites; the Dee, he Solway, the Wash and Morecambe Bay. The aim of the barrage which s really a low dam is to store freshwater at the river estuary before it enters he sea. It has been estimated that water held behind a full barrage at Morecambe Bay would amount to 2·2 million m^3 of water a day.

It is argued that apart from augmenting water supply, which is the main urpose, the barrage would also provide an economic stimulus by turning nud-flats into an area of recreational opportunity. Feasibility studies anctioned by the government have shown that the full barrage at Morecambe is likely to be accompanied by undesirable silting problems. The most likely solution is to have a partial barrage across the mouths of he Rivers Kent and Leven which feed into the Bay and to pump the water hus held back into storage reservoirs. The cost of building such a scheme s around £78 million and even if the go-ahead were given now the first vater could not be drawn until the 1980s.

Water supply has always been subject to the influence of the weather and he water engineer has to make very careful calculations to ensure that his eservoirs do not run dry—he has to hedge his bets against climatic ncertainties. The collection of rainfall data over long periods, together vith records of the state of contents of reservoirs, makes it possible to rrive at more accurate rules for managing reservoirs. Analysis of such ecords for one of the Welsh reservoirs over a 55-year period has shown

that more water could have been taken from this particular reservoir without hazarding supply. It is suggested that if applied to all reservoirs this kind of analysis would make more water available quite safely.

Taken a stage further and coupled to computer techniques it is now possible to work out programmes for operating several sources together. The joint yield of water from the individual operation of say a group of boreholes, a reservoir and a river can be considerably increased by rules arrived at mathematically for operating the same sources conjunctively. It also means that a district which has an excess of water at any one time can switch the supply to a nearby area of need.

This is perhaps a stage on the path to a national grid for water along the lines of the electricity network. There are enormous problems involved in transferring water over long distances but limited transfers already exist. A scheme is under way, for example, to transfer water from the Ely-Ouse system in East Anglia to Essex where it will augment the supplies by 24 million gallons a day.

Freshwater from the sea

It has been said that with the water engineers eyeing the estuaries, the only supply left is the sea. Desalination is one of those concepts that captures the imagination and sounds more feasible than it is. But having said that one has to realize that desalination is very much a fact of life in Jersey where a third of the island's summer water supply comes from a desalting plant. However, the circumstances are peculiar to Jersey and highlight the position regarding desalination—at present its cost is such that it is only economic in areas that have no other, or inadequate, freshwater supplies. The cost of land in Jersey made reservoir building prohibitively expensive yet more water had to be obtained to match the demands of the island's tourist and horticulture industries. The answer was the British installed desalination plant which produces $1\frac{1}{2}$ million gallons of freshwater a day at a cost of about 75p per 1,000 gallons. When compared to the cost of water on the mainland, between $12\frac{1}{2}$p and $22\frac{1}{2}$p per 1,000 gallons, it can be seen that desalination is not the immediate answer.

Various innovations have been put forward to make desalination less expensive. Since desalination requires a lot of heat, it has been suggested that plants be linked to power stations in order to use the waste heat produced. Another possibility is to work out rules for operating a conventional reservoir and a desalination plant together. The idea is to take more water from the reservoir than would be possible normally and to use the desalination plant as a stand-by supply.

The controversy over desalination will continue and some advocates suggest that as population continues to increase and demand for water grows we will be forced to build desalination plants. In the event, that would at least be more feasible for island Britain than for those countries whose geography makes them landlocked.

Re-use of water

Greater use can be made of water by encouraging industry to re-cycle it. This indeed is likely to be one of the chief strategies during the next decade. Rivers will have to be maintained in a cleaner state and the quality of sewage and industrial effluent controlled to the point where it is both possible and safe to use the water several times between source and sea. It is a well-known conversation piece now to say that the water drawn from a tap in London has already passed through a factory or human system at Swindon or Reading. That this is true can surely only reflect the greatest credit on the water engineer!

Many industries now use their process water several times and in so doing make a savings not previously anticipated. The British Steel Corporation at its Scunthorpe works, for example, now uses only 5 tons of water to make a ton of steel where previously it used 200 tons.

Another potential source of water is to extract from rivers at present heavily polluted. Most industrial nations have to face the situation that the areas of population where they now most need water are those same areas where the rivers have been treated virtually as sewers. Consequently it is not possible to meet the extra demands simply by drawing the water that runs through their midst. In Britain, the River Trent, now the subject of extensive study, carries nearly a third of its volume at Nottingham during the summer as sewage effluent.

Studies are in hand to find ways of using a heavily polluted river which, apart from the sheer volume of effluent it may be carrying, can also contain contaminants of which little is known. There is no point in cataloguing waterborne industrial contaminants, suffice it to say that ever more sophisticated, hence more expe sive, methods are needed to treat the water. Work on these problems has shown encouraging results and the international nature of the problem has led to useful exchanges of research.

In Britain, we are used to water supplied as a very cheap utility, less than 10p per head per week. Moreover, it is a commodity that is unique in the manner in which it is taken for granted—like free speech it is regarded as an inalienable right. Consequently, any moves which lead to an increase in the price of water are likely to be regarded very suspiciously. For example, any suggestion that individual homes be metered for water supply becomes a political issue.

There is certainly a need to impress on the public that water is a vital resource and not just something that is the cheapest thing you can think of—"Spending money like water" explains current attitudes. Hand-in-hand with all the other measures, people must be encouraged to use water more sparingly. A great deal of water is wasted: consumers let taps run unnecessarily and put up with leaky installations, and the water industry loses water accidentally through burst pipes and old, inefficient mains networks. The industry is monitoring its own waste and encouraging its consumers to do the same. Nevertheless considerable quantities of water treated to a high standard are simply lost.

Another way in which it is argued that water is wasted is in the flush toilet. The two gallons of water used at each flush add up to a tremendous Rater demand. It has been estimated in Munich that after a TV transmission of a football match water was being flushed down the city's toilets at a rate of 1,800 litres a second. However, a new flushing system has been developed in Sweden and is being evaluated in Britain. It uses vacuum removal and requires only a pint of water per flush.

One of the greatest anomalies concerning the use of water is that water treated to a high standard for human consumption is used for flushing toilets, washing cars and for many similar applications. It makes sense to use a lower grade of water for many of these applications, but this will involve the expense of new installations and changes in thinki g. Another idea originating in Sweden is to separate the two kinds of waste water produced in the bathroom. At present, toilet waste is expelled together with water used for bathing and washing. If the bath and wash water were taken off separately they could be recirculated for industrial use. Systems for dealing with household waste water in this manner are already used in parts of Sweden and the USA.

The water engineer's challenge is clear and it is one that he accepts. He has to provide an adequate supply of safe water to every domestic, industrial and agricultural user; his industry must meet peak demands by having suitable reserves to hand even when natural resources are at their lowest; and he must face the daunting prospect of spiralling demands. Moreover, he is dealing with a commodity which is vital to public health.

The new regional structure which encompasses all water uses gives the best chance of assessing the many options available. Technical innovation allied to a more enlightened public view of water as a vital resource is the only approach that will safeguard the "fount of life and fun".

Future Urban Development

Stephen Petter

People choose to inhabit cities for economic reasons. The technology which has permitted them to leave the land is agricultural. New crops, new hybrids of seed or animal, new techniques and machinery, better transport, distribution and trade, have enabled the majority of people to be fed by a small minority of agricultural workers. Only where they have an effective political voice, as do the peasant farmers of France, can the sometimes harsh results of advances in agricultural technology be temporarily alleviated for them. Generally they become unemployed or are otherwise attracted to the cities. Hence the situation in the United States where 80 per cent of the population inhabit 3 per cent of the land surface.

Whether the cause of urbanisation is rural-push or urban-pull the basis of a city's attractiveness lies in the spatial proximity of objects of interest —notably jobs, shelter, shops, services. Cities consist of a high density of places of interest, connected by communication channels (usually roads), the effect of which is to reduce the aggregate of time and of *human* energy devoted to traversing the intervening spaces.

Vital to this process is not only the existence of a wide variety and choice of places of interest, but of fast and easy transport, for people, goods and messages. All these travel along routes which, as the city expands, become saturated. Either existing routes are expanded, or new routes are cut or technological alternatives are developed.

Frequently these adjustments result in a new urban form. In particular, transport affects the sizes of cities, the commuter train line being most pertinent. The technology of railways and the lack of refrigeration resulted in the explosive growth of Chicago. When interstate highways and massive refrigerated container trucks were developed a wide area of central Chicago (the Union Stockyards), was freed for redevelopment. Similarly, in London containerisation is moving the centre of dockland downstream to Tilbury, freeing huge areas of inner East London for development. Will these areas be decimated by motorways which themselves may become obsolete in the not too distant future?

People-transportation systems are saturated in the centre of major cities. Three factors are relevant:-

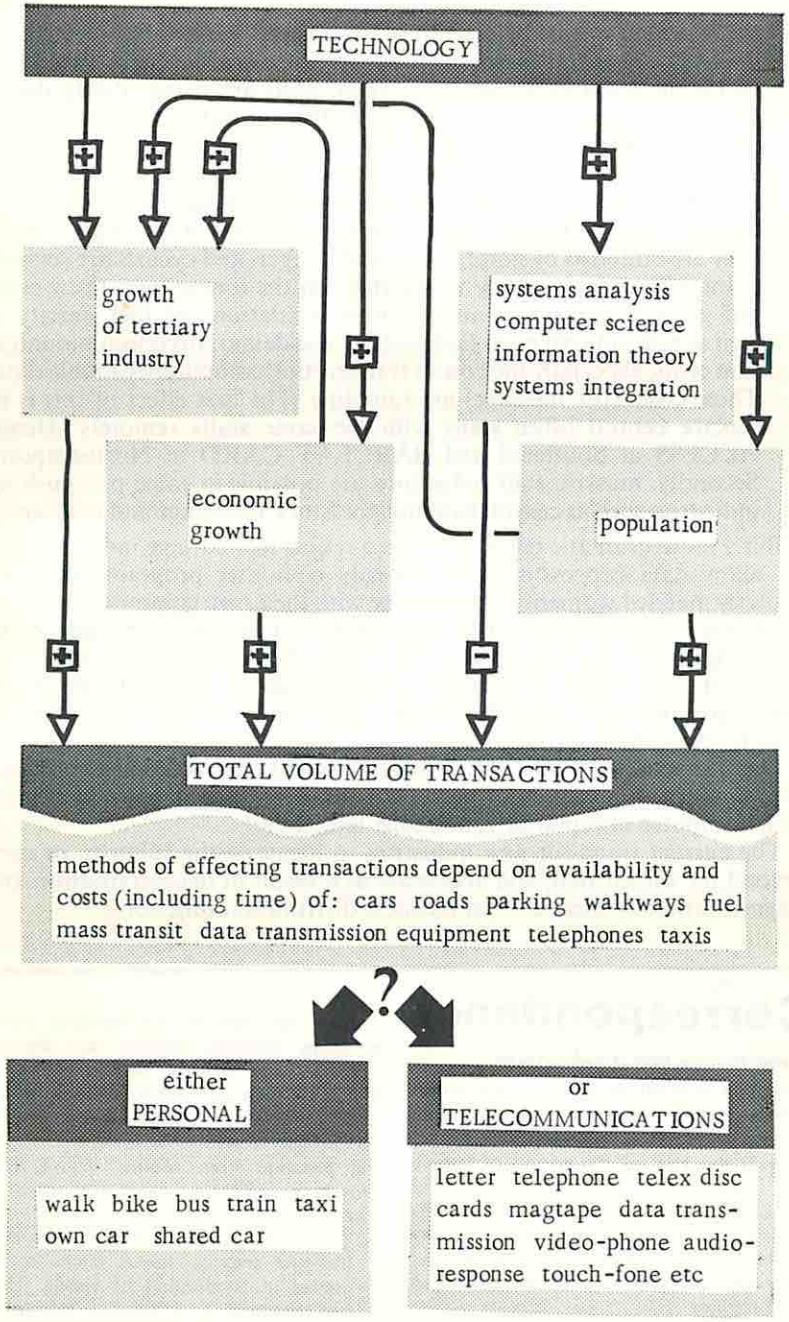
(1) The use of motor cars is virtually insatiable. Britain could not afford to devote one third of her land surface to the car, as has Los Angeles (and still they have congestion!).
(2) Scarcity of fuel in the next few decades.
(3) Developments in telecommunications may get round the problem by lessening the necessity for people-transportation.

The centres of large modern cities are dominated by offices, the main function of which is the processing of vast volumes of data by massive office staffs. Recent legislation, VAT, Common Market regulations, the proposed new Income Tax scheme and so on result in ever-increasing needs for data processing (DP).

In fact, the converse also occurs whereby new, cheaper forms of DP enable completely new facilities to be offered, such as credit cards.

The **Figure** below show this writer's idea of:-

(a) the main factors affecting the volume of transactions generated. Technological progress increases all the main transaction generators (economic activity, tertiary industry, population). It also could result in some saving of transactions (at least, saving of extra-commuter transactions);
(b) the methods by which the communications in connection with the transactions are transmitted, either by face to face meetings and the carriage of people to nodal centres of communications, or the transmission of data by letter or electrical/electronic media;



(c) the selection of one of the two major routes (personal or electronic) depends on many factors. However, they are basically two fold: (i) People transportation costs. These costs are rising. Partly this is due to mismanagement of the people-transportation system (mainly because few effective authorities see it as a single system. Thus nearly empty cars are allowed to block vital communication routes, empty are allowed to occupy valuable areal surface, mass transit is allowed to run down, pedestrians are crowded onto narrow sidewalks where they are buffetted by noise, fumes and danger, and cyclists are socially ostracised and physically vulnerable). In the longer term these costs will go up as a result of antipollution legislation and fuel scarcity as well as self-induced costs (congestion, accidents); (ii) telecommunication costs, especially the cost of transmitting computer-readable data. These costs (per message) are tumbling. The first effect of this is to replace central office staffs with the same staffs remotely. Hence ACCESS at Southend and BARCLAY CARD in Northampton. Secondly, massive staff reductions are possible in some pen-pushing industries such as central banking, the Stock Exchange and Insurance.

But a more dramatic effect could be a return to a cottage industry basis for many data processing jobs. Already computer programmers (particularly married women) work at home with their own computer terminal. These are quite cheap, e.g. £70 per month, and can be connected via the PSN (the Public Switched Network) simply by dialling the number of a computer. The Open University computer service runs on this basis. Small groups of programmers have established independent firms in remote locations in Britain.

One can imagine collectors, insurance agents and salesmen replacing time now spent in written or personal contact with their bases by time at their computer terminal or touch-tone telephone.

The current trend for new industries to locate in the suburbs, or even beyond the Green Belt, will accelerate as a result of decentralisation and fragmentation of some central business distribution functions.

Correspondence

Food Prices and Alternatives

Now that food prices are rising and world food shortages are imminent is it not time to go a step further, and admit that we are now at the start of the period of famine that must result from the growth of population, and even more from the growth of superfluous machinery. Yet we could have enough to eat, even of our own producing, if we radically changed our priorities.

Near the turn of the century, some sensitive thinkers foresaw our present impasse, and pointed to the solutions. But such men as Ruskin, William Morris and Kropotkin have remained voices in the wilderness. Nonetheless, is not the following passage from Morris' *'News from Nowhere'* (1891) an exact description of our problem:

> ". . . in the last age of civilisation men had got into a vicious circle in the matter of production of wares. They had reached a wonderful facility of production, and in order to make the most of that facility they had gradually created (or allowed to grow, rather) a most elaborate system of buying and selling, which has been called the World-Market; and that World-Market once set a-going, forced them to go on making more and more of these wares, whether they needed them or not. So that while (of cours;) they could not free themselves from the toil of making real necessaries, they created in a never-ending series sham or artificial necessaries, which became, under the iron rule of the aforesaid World-Market, of equal importance to them with the real necessaries which supported life. By all this they burdened themselves with a prodigious mass of work merely for the sake of keeping their wretched system going".

Kropotkin, ten years later, after an intensive study of production methods throughout Europe, concluded (in his *Fields, Factories and Workshops)* that Britain, which was then importing an even higher proportion of her food needs than today, could quite easily feed herself, if the grandiose idea of being 'the workshop of the world' were abandoned. He also showed that two hundred families, say a thousand people on a thousand acres, could so arrange their affairs as to be completely self-sufficient in all their needs, and would need much less labour than our present faltering system demands.

Nearly a hundred years earlier, Charles Fourier has expounded extensively along the same lines, even maintaining that, properly organised, work, with a change of occupation every one or two hours, and with congenial companions, might be pleasant, or even fun.

It seems time that some more experiments to test out this possibility of an intensive agriculturally-based culture were made. Such experiments would be much facilitated if they were part of an official policy, which could cut across the biggest obstacle today, the price that has to be paid for land—due to the enslavement of everything to that overwhelming task-master, the World-Market.

Perhaps it will require the sort of jolt that a return of food rationing will bring before the alternatives to industrialism and dependence on world trade will be properly explored. It seems probable to me that such rationing is bound to be started, regardless of the party in power, before 1975. In the meantime, if others interested in the idea of an experiment along the lines of 'Kropotkin's Commune' suggested above (at this point only an idea needing further research), I would be interested to hear from them.

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Herts.

Announcements

TOWARDS SURVIVAL Back copies are available. Numbers 7 to 13, 11p each; Number 14 onwards, 15p each, all including postage. Subtract 1p each for plural orders. "A Programme for Survival" and introduction by Margaret Laws Smith. 2,000 word single sheet: 1 for 5p, 10 for 10p, 50 for 25p, inc. postage.

THE ENERGY DEBATE: The Conservation Society Working Group on Energy is preparing a comprehensive classified "inventory" of the moral, factual and logical factors involved. A small amount of help from a large number of people would ensure nothing important is omitted. Please write for more details to Roger Haines, 84 Bramhall Lane, Stockport, Cheshire.

WASTE NOT . . . A detailed report and financial analysis of a waste paper recycling scheme recommended to Camden Council. Price 50p, Camden Friends of the Earth, 45L Upper Park Road, London, N.W.3.

A BIOLOGICAL APPROACH TO SOIL HUSBANDRY course has been arranged by the Soil Association, 8-12 July 1974. Fee £18 which includes tuition, two meals a day and snacks. Dr. A. Deavin, Ewell County Technical College, Reigate Road, Ewell, Surrey.

S.P.E.S. SUNDAY FORUM. March 10, 3 p.m. Speaker, Margaret Laws Smith on "A Program for Survival", Conway Hall, 25 Red Lion Square, London, W.C.1. Admission free. Tea at 5 p.m., 15p.

CAN BTITAIN SURVIVE TOMORROW? . . . All the survival issues in one handy, illustrated booklet. The problems—food, energy, technology, growth, transport, quality of life—and today's action for tomorrow. Ideal gift for Councillors and M.P.'s. Price 13p post free from Mike West (Portsmouth Branch of the Conservation Society), 6 Hillbrow Close, Rowlands Castle, Hants PO9 6DJ.

ECO-COOK BOOK. Recipes interspersed with eco-chit chat. Excellent for giving to cynical friends. Gentle persuasion. Published by Edinburgh FOE, 13p post free, from 42 St. Stephen St., Edinburgh.

SEED. The Journal of Organic Living. Send 23p post free for current issue, 269 Portobello Road, London, W.11.

A brief message to animal-lovers.

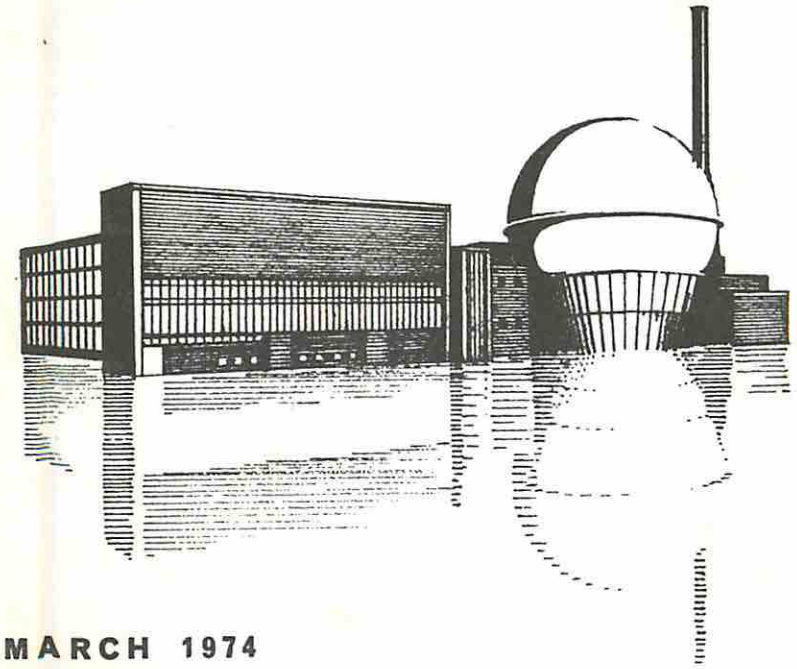
THE HEAVY HORSE PRESERVATION SOCIETY (HHPS) asks your immediate contributions in cash, or articles such as clothing, books, coins jewellery, stamps, etc. towards a national £10,000 fund closing Dec. 1974 for saving a few survivors whilst there is yet time. About £500 is needed to buy a heavy horse and arrange a permanant home for it. The Society has many approved homes waiting but needs cash to buy the horses, and calls on all animal-lovers to treat this appeal as urgent.

Due to the mechanisation of both farming and transport, over 99 in 100 working horses have been sent to the slaughterhouses because there is no longer a profit to be made from employing them. The killings continue and the few remaining horses face the same fate as the 99% already killed. At this terrible moment for these horses, a new chasm has opened under their feet in that fantastic prices are being paid for them by continental butchers who sell horsemeat for human consumption.

R.G. Hooper, Hon. Treasurer
HEAVY HORSE PRESERVATION SOCIETY
Old Rectory, Whitchurch, Shropshire SY13 1LF

TOWARDS SURVIVAL 20

A Journal of Sustainable Policies



MARCH 1974

TOWARDS SURVIVAL

20

MARCH 1974

Subscriptions: 90p for 6 months; £1.80 for 1 year. Payments to *Towards Survival*. *Towards Survival*, 79 Sutton Avenue, Eastern Green, Coventry CV5 7ER. Tel. 0203 463062

Editor: Keith Hudson; Economics Editor: Margaret Laws Smith; Poetry Editor: Eric Millward (Hope Cottage, 67 Hillside, Horsham, Sussex); Consulting Editor on Population: Dr. John A. Loraine.

Editorial

In this issue we have no space for a normal editorial. As this goes to the printers on the day of the dissolution of Parliament and will be in your hands when the results of the general election are announced, one can do little more than a circumspect jump over the whole proceedings. However, we would send our heartiest good wishes to those of our associates who are standing, notably Dr. John A. Loraine of our editorial board, and Colin Hutchinson, chairman of the Conservation Society.

The Financing of Conservation Projects

Margaret Laws Smith

The Consolidated Fund is the account kept by the Government of the United Kingdom at the Bank of England into which all proceeds of taxes and other revenues of the State are paid and out of which all Government expenditure is made.

A few special monthly payments are made regularly from the Fund under statutory authority to meet expenditure which does not require the annual approval of Parliament. Such payments include the interest on the National Debt and the salaries of the Lord Chancellor, the Speaker of the House of Commons and Her Majesty's Judges. All these payments thus constitute a prior charge on the national revenues which must be met out of tax revenue before any other payments are made.

For all other government services, which are known as Supply services, money is only paid out of the Consolidated Fund in accordance with the Acts which are founded on Ways and Means resolutions, to meet the expenditure contained in the Estimates. These Acts are passed eacy year as the final act by which Parliament approves and consents to the taxation and expenditure proposed by the Government in its Budget, or Budgets, as amended by the House of Commons.

Thus at the present time the prior charges on the Consolidated Fund which are paid without the necessity for the annual consent of Parliament are very few, and those which are embodied in the annual Ways and Means resolutions are very great, but in this distinction I think there are possibilities for finding new ways of financing social projects which may be useful in our efforts to move towards a stationary society, and more consistent with the smooth working of such a society.

In the past arbitrary taxation by the Monarch was the source and means of tyranny. Annual Parliaments and Annual Budgets, and the complete control of the Commons, have been our guarantee of freedom. It was this attitude which was responsible for shaping our Constitution in the age of expanding trade and budding technology from the 16th century to the early years of the 20th. Individuals by their trade and industry produced all the wealth, and then the Government took part of it to finance the doing of those few things which the traders, manufacturers, landlords and workers who made up the Commonwealth could not do individually. In the 18th century the only thing they wanted done for them collectively and nationally was the protection of the realm, and that as economically as possible. Social services were still at a parish level with an overseer of the poor, and the local Justices of the Peace. The great growth of towns, of London and of those in the north and midlands, and the growth of urban industrial employment generally required the development of very large social services. Today social services and public administration employ almost thirty per cent of those in employment. In addition the Government is ultimately responsible for the nationalised industries and provides funds in aid of industry and for industrial work in the so-called redevelopment areas.

Now whether any of this work is new or is such a fully entrenched part of our national life that it would be impossible to dispense with it, appropriations, that is authority for expenditure upon it, must all be passed through the annual budget and the money made available by an annual vote.

Since there are these two ways of authorizing national expenditure I think we might begin to ask whether it would not be more appropriate for a great deal of expenditure which is in respect of services which are expected to continue, and that we all wish and intend to continue for some time, should not be made a prior charge on the national revenues for some definite period of time, instead of a matter of annual appropriation subject to the will of the government of the day.

All payments by annual appropriation are part of a particular Ministry's demand on the Treasury whose total budget must be voted in Parliament. The justification in theory for this annual control comes from the old feeling that the King and his Ministers are spending the people's money

at their own will and pleasure, and they must be subject to an annual check. But now that government departments and local authorities control the employment of about one-third of those employed, and the social service payments to the old, young, the disabled and those unable to work, any actual control of the details by Parliament becomes an impossibility from sheer size.

The channelling of all demands for money through the estimates prepared by the Minister, the Permanent Secretary and senior civil servants in charge of a department is the basis for bureaucratic control over the central services directly and, through their grants in aid, of the local services too. If you drive anywhere in England noting the new schools as you pass you will see how alike they all are. This may be because this type of school is the best possible, or it may be because each local authority, if it is to get its grant towards a new school, must submit the sort of plan that will get instant unquestioned approval from those who can secure or withhold the grant.

In making up the total estimate for a department many worth while things, many quite small, have to give way to the needs of the government of the day. In such an atmosphere of control from above individual creative powers do not work freely. Work is adapted to please the next man above up the ladder of authority, and he does not act as a patron who brings forth the creative powers of others because he himself must select what will get by and be approved when the collective estimates for everything are finally considered together.

Everything of quality in our lives which is man made is shaped by the separate individual mind. It is the individual mind that has the vision, that conceives the idea and it is only the individual who can follow it through and create what is conceived, or now again two minds or a small group in partnership acting as one.

The great art of our civilization has been produced for the patron. Italian Renaissance painting was executed for churches or great merchants. Michael Angelo's painting of the Sistine Chapel for the Pope comes to mind. The English countryside has been shaped and created by the great landowners of the past three centuries. The ducal palaces and country houses employed architects like Inigo Jones and Vanbrugh. The gardens and parks were the result of the landscape visions of men like William Kent and 'Capability' Brown. The relationship of the patron to the artist is an essential part of the total creative process.

The notion often met with today that the artist works best in total freedom, and that he in his nature is free above all other men, is one that I am sure is wrong. The best work of all kinds is produced *by* someone *for* someone. Creative work is never done just for money, but in a monetary society a money price is necessary, and is also an assurance that the creative worker is wanted and that what he can do has value in

the eyes of others. It is the patron who discerns genuine creative ability in the artist and by employing him defines his task and sets his problem, which it is his art then to solve. The patron, that is the person who orders work to be done, must therefore have freedom to define what he wants, and to employ those whom he thinks are fittest to achieve it. It is an entrepreneurial type of activity. It only works well if one mind has the power to conceive, to define, to order and control.

No committee can do it. Though formally a committee is set up to work as one in fact it cannot do so. All its members are pursuing their separate aims: perhaps to get the better of one another; to feel important and enrich themselves by listening to their own words; or to trade their votes on one issue for support on another. A committee can only be an effective patron if it is in fact dominated for a long period by one man.

The dreariness of the high rise flats and office buildings, their inhumanity, and their daily death dealing power over the uprising of the human spirit, are due more than to anything else to their having been selected and passed by a committee. The committee may have been the housing committee of a local authority or the board of a development company whose sole aim is to gather in the profits obtainable from one site in order to crash on to the exploitation of the next. Unfortunately almost everything new with which we have to live today and with which a number of generations will have to continue to live is being built by this type of public authority and large corporation. The conditions which produced good buildings and good planning of building areas in the past have been practically squeezed out.

One of the greatest problems in the immediate future will be to ensure our food supply and that will mean that we shall be forced to stop any further extension of building on green land. The only way in which we shall be able to house and employ our still increasing numbers will be to redevelop derelict urban areas for industry and residence. So, is there a way in which we can rescue our environment from the blighting deadness of committee decisions and bring back the entrepreneurial freedom of the patron to commission and that of the planner, architect and artist to work for him, within the scope of public employment?

It seems to me that something might be done, on a very small scale at first, by making annual grants to new organisations for certain purposes guaranteed for a longish period of time, say thirty or fifty years. This could be done by a special act making them another first charge on the Consolidated Fund. These organisations would then be freed from central or local political control, which always means, I must stress, not the control of the public but that of politicians for separate political ends.

The kind of organisation that is needed is some local board of managers who would appoint a head or director with freedom to make plans, appoint his staff and commission work, and having appointed him would let him alone. The board should meet infrequently to approve the annual

accounts and to provide just the minimum check necessary to prevent fraud and to guarantee to the public the value of the enterprise. The board should be something like the Governors of some provincial universities which consist of local people respected in their own spheres who are interested but non-interfering.

In order to get this new alternative method of financing public work accepted it would be important to choose the right object to act as the precedent. I have often thought that the preservation of Cathedrals and Parish Churches would be most suitable. We have these buildings, often magnificent and always interesting, which have been handed down to us by the care given them in the past. We all agree that it is our duty to maintain them for their historical interest and for the living voice of the past which they can carry forward into the life of the future. Grants for such work should be a first charge on our national revenues, and it should not be left to the struggles of local appeals, bazaars and fetes to raise the funds. Funds need to be guaranteed for long time ahead, since the work and the duty to the future to do it will never end while the buildings can be maintained at all.

In this case the units of management are already fairly clear. The cathedrals have their own organisations of dean and chapter and the parish churches are grouped in dioceses and a suitable organisation related to the diocese could be formed.

How should the amount be settled? First an amount for the next five years should be provided to carry out urgent work. After that a sum should be guaranteed for a much longer period or indefinitely based on the wages of the number of persons to be employed, the amount to vary with future wage rates so that the same numbers can continue to be employed however wage rates change.

Once a precedent was established and some of the difficulties encountered and overcome, the idea might be extended to museums, parks, reclamation areas, housing estates and special educational institutions. It is not a proposal for the altering and overthrowing of all existing local government activity. It can only be successful as the result of accumulating experience. Even the first plans for church maintenance will require a great deal of preparatory work. It will need to be considered what specialists will be required, historians, archaeologists and architects, and what craftsmen. Arrangements should be made in advance for the training of these if necessary so that they are available when required, and that means grants for training and perhaps the extension of some university faculties and technical schools to provide it.

All such plans are not things that can be rushed. They need to be started soon and developed gradually so that they can be expanded to meet the needs which will certainly arise in the future for opportunities for employment in the conservation of our natural and man made heritage.

It ought not to have happened in the way that it did

George L. Weil

As this is being written, the major topic of concern among industrialized nations in the energy shortage. Although the situation has affected the welfare of hundreds of millions of the world's population, and placed heavy economic burdens on them, it has had one productive impact—the matter of energy is now on the front burner in the range of public affairs. Attention is now being focused on both short and long term solutions to energy demands. Beyond the now obvious imperatives of energy conservation, the advantages and disadvantages of all readily identifiable energy resources are being examined by innumerable governmental and private studies.

With very few exceptions, nuclear fission energy stands high on the list. It is represented as the principal ingredient in the energy mix which will satisfy both short and long term requirements. Nuclear fission energy is hailed as the resource which will provide energy for thousands or even millions of years, depending upon which paper you read.

True, as of the beginning of 1974, some 74 commercial nuclear power plants (over 200 Mwe) have been built in 11 countries in the free world, and many more are either under construction or planned. I have used the term "built" intentionally, in order to avoid the connotation that existing plants are in fact either generating electrical energy, or operating at their designed capacities. For example, the U.S. Atomic Energy Commission (USAEC), as well as other sources of misinformation, uses the terms "operable" ("licensed to operate") and "operating" synonymously. The fact is: US plants are generating only about 60% of their total licensed generating capacities. Comparable statistics apply to other countries. However, in no country does maximum "designed" electrical energy capacity of "operable" nuclear plants exceed a small percentage (about 5% in the US) of total electrical generating capacity—and, at least in the US, actual energy generated is less than about 3% of the total installed capability. Thus nuclear energy does not at best make any substantial contribution to current energy needs. By the same token, the unreliability of nuclear plants does not significantly aggravate the shortage situation, except in a few regions where concentration of plants is high.

If one examines the longer term, and the planned proliferation of current types of plants, their low efficiency in utilizing uranium resources (about 1%) will restrict them to a very limited economic life—perhaps only a few more decades—before the relatively cheap, high-grade uranium deposits upon which they depend for fuel become exhausted. This is hardly the potential limitless energy resource claimed by nuclear fission proponents. However, before resolving this apparent discrepancy, one

may find it interesting to digress from the "practical" aspects and briefly explore the "fundamentals".

From the purely scientific point of view, the nuclear characteristics of uranium are fascinating. Naturally occurring uranium consists of two major kinds: 99·3% uranium 238 (U–238) and 0·7% uranium 235 (U–235). Our ability to extract useful energy from uranium rests not only upon the convertibility of mass into energy (Einstein's $E = mc^2$) by fissioning U–235, but also upon a very fortunate, even unlikely combination of nuclear constants and interactions between nuclear particles. These characteristics provide, first, the basis for the divergent chain reaction, which allows us to rapidly compound the infinitesimal energy from a few naturally occurring fissions per second in uranium to the tremendous numbers required to produce useful amounts of energy, billions upon billions of fissions per second; and second, to convert U–238 into another nuclear fuel, plutonium 239 (Pu–239), which does not occur in nature. (It may be of passing interest to note that, if left alone, every 24,000 years one-half of the plutonium nuclei distintegrate and are transformed back into U–235 nuclei—where it all started!)

It was the challenge of technology to put the unique potentialities of nature to practical use. Unfortunately, the first application was the production of plutonium for devastating weapons. But the switch to peaceful uses did not require the development of difficult new technologies. However, the current technologies are based on utilization of low abundance U–235 as nuclear fuel. If nuclear energy were confined to that, it would indeed be a short-lived resource—just a nuclear flash in the energy pan!

However, once again nature presents a remarkable opportunity. The nuclear properties of Pu–239 as the fissionable fuel combined with those of high abundance U–238 are such as to provide the means whereby, in principle, significantly more Pu–239 can be produced from U–238 than that consumed in the course of producing energy. Some of this Pu–239 can be returned to replace that consumed; the excess can be diverted to provide fuel for a new plant. For obvious reasons, this process is referred to as "breeding". Therefore, the potential exists for expanding our resources of nuclear fuel on a compounding basis, substantially increasing the efficiency of utilizing our uranium resources and thus making economically available low-grade uranium deposits.

Efficient breeder plants, then, represent the only likelihood of realizing the full potential of nuclear fission energy. This substantial resource thus resolves the discrepancy noted earlier, and in principle can provide energy until either the cost of uranium extraction or the devastation of the land becomes of primary importance. This is the promise of nuclear fission energy. Now we face the problem of developing a radically new technology directed to the goal of achieving economic, efficient commercial breeders.

A number of nations, including France, the UK, the US and the USSR, are pursuing this objective.

The promise of fission energy is tantalizing. But nature exacts from mankind a high price for the privilege of exploiting this energy resource. The public must decide whether or not the price is too high.

Production of electricity by a nuclear power plant is inescapably coupled with the production of hazardous radioactive materials, primarily the products of fission plus plutonium itself, the deadliest substance known to man. The radiations from these materials can kill instantly, can produce various forms of cancer that may not appear for decades, and can cause genetic damage that may not appear for generations. The severity of these effects depends upon many factors, but there is general agreement that any radiation is harmful to mankind.

Comparisons of safety records with other industrial operations are very misleading, not only because, by contrast, the nuclear industry is very young, but more importantly, because the effects from radiation exposures, whether instantaneous or cumulative, do not necessarily show up immediately as countable corpses or visible injuries. A commercial plant of 1000 megawatts will contain the radioactivity equivalent to the fall-out of 1000 Hiroshima type bombs. Breeder concepts will be even more hazardous because, in addition, large amounts of plutonium will be used as the nuclear fuel. In this context, nuclear fission energy is not the "cleanest and safest", but rather the "dirtiest and most hazardous" form of energy known to man.

The name of the game is "Keep Radioactivity Out of the Environment Forever". Accidental release to the environment of only a small fraction of the radioactive materials contained in a nuclear plant represents a monumental threat to land use, and to the lives of exposed populations, as well as to the lives of generations to come. A USAEC study performed eight years ago, but with conclusions released only recently, of a hypothetical major accident at a then "modern" US 800 Mwe nuclear plant involving the release from the containment to the atmosphere of an arbitrarily assumed 15 per cent of fission products could cause 45,000 fatalities, 74,000 injuries, contamination of 50,000 square miles, and $17 billion damage.[1] There was no estimate of the genetic damage which would be inherited by future generations.

The safety of an energy economy based on nuclear fission is categorically determined by the successful containment for thousands upon thousands of years of even a small fraction of these cumulative amounts of radioactive "dirt" under all foreseeable, and indeed, even unforeseeable malfunctions, accidents and sabotage which may occur in the nuclear fuel cycle. Plutonium is of particular concern not only because of its high toxicity, but also because it is bomb material. Only small quantities, ten kilograms or less, need be diverted to provide a clandestine nuclear weapon. One can readily foresee the potential for a black market in this material.

Even if we optimistically assume a safe *modus operandi* in our lifetime, it is morally incumbent upon this generation, if it opts for nuclear fission energy, to take into consideration the derivative responsibilities with which future generations will be burdened. Moreover, in terms of demands on human nature and social institutions, history provides little confidence that mankind is sufficiently responsible to accept what Dr. Alvin Weinberg has aptly named the "Faustian bargain".[2]

Although it has been imperative from the very beginning that safety must be paramount in the design, construction and operation of nuclear and ancillary plants for commercial use, these activities cannot be divorced from the fact that the designers, equipment fabricators, construction workers, plant operators and managers are fallible. This human fallibility is the inherently weak link between "drawing-board" and actual safety. This human fallibility can be the means, either through poor design, miscalculations, bad judgments, negligence, carlessness, or errors, that can violate the postulated inviolate integrity of even the best plants now being designed.

It is one of several noteworthy contradictions by nuclear advocates for the commercial use of nuclear energy when, on the one hand, they claim safety and reliability, and on the other hand they are frequently compelled by unanticipated threats to safety to compromise reliability. This is as it should be. Safety should, of course, override all other considerations. But by no stretch of the imagination is safety thus assured.

Although there are undoubtedly differences in the inherent safety characteristics of the diverse nuclear power plant concepts developed for commercial use in the several nations, they each suffer from one trend, namely the economic incentive to obtain more and more energy from the same amounts of fuel inventory and plant investment. Moreover, as one considers the hazards of a nuclear fission economy, although a catastrophic accident at the generating plant may represent the single most hazardous event, over the long run one must consider the cumulative hazards resulting from the build-up of radioactivity in the biosphere from the entire fuel cycle—from uranium mining to radioactive waste disposal. Environmental pollution by radioactive materials is irreversible, and becomes harmless only with the passage of time—hundreds of thousands of years after the last nuclear plant is shut down. Moreover, environmental pollution, particularly in the atmosphere, recognizes no international boundaries.

A more readily understandable contingency, deriving directly from the potentially catastrophic nature of nuclear plant accidents, is the likelihood of forced shutdown of all nuclear generating plants if an accident, even a small or a very close one, should occur. If this should happen at a time when nuclear energy provides, say 50 per cent or more of total electrical generating capacity (as predicted for the US in the next decades), the resulting black-outs would, in comparison, make the present "energy crisis" appear about as important as a rained-out children's picnic!

If not nuclear fission energy, what are the immediate alternatives? Because there may be a decade or longer between the time a nuclear plant is ordered and designed generating capacity is achieved, it is not unrealistic then to expect that within this period technologies for meeting environmental standards can be developed which will allow utilization of our major resources of fossil fuels.

Coal resources in the world are generally considered sufficient to meet anticipated energy requirements for several hundred years. If we assume that the associated environmental problems are solved, the use of coal then would provide a period of grace in which to develop other long-term energy technologies safer than nuclear fission. At present both fusion and solar offer this possibility.

Although the energy from fusion is also nuclear, the potential hazards are many orders of magnitude smaller than those for fission. Solar, whether utilized directly or indirectly, for example, through effects in the atmosphere and the oceans, is the environmentalist's dream. However, if efforts to develop widespread use from one or both of these sources should fail, and no new acceptable energy resource is discovered, our descendents will have no choice but to take their chances with nuclear fission breeder energy.

There are many reasons that are advanced to account for general public apathy to the serious issues raised by our rapid expansion into a nuclear fission economy. Probably the most important is that the public has not experienced a serious accident. Thus there is confidence in the widely publicized reassurances of safety which emanate from the nuclear advocates. Under such circumstances, the public is much more concerned with clearly recognizable problems such as inflation, shortages and unemployment. However, in my opinion one obstacle, perhaps the most important, which has not been given much attention and which is unlikely ever to be overcome, is the fact that we cannot give our children, or even their parents, little nuclear power plants to put together, to take apart and to play with in the basement or the backyard! There is hardly a man in industrialized nations who hasn't played as a child and grown-up with engines, automobiles, model airplanes, and most forms of chemical energy. Such a background provides familiarity (without necessarily understanding the basic scientific concepts) not only with the technologies, but also with the hazards.

In summary, a large-scale nuclear fission energy economy, whether based on current or projected breeder plants, is unacceptably incompatible with mankind. There are too many serious unsolved problems, two in particular, safety of plants and disposal of radioactive wastes. The nuclear advocates rely on visionary "fixes" based on a degree of unadulterated optimism which makes those engaged in developing fusion and solar energy appear to be downright pessimists.

The nuclear energy nations, so far as we can know, have thus far escaped any catastrophic, or even observable, harm to the public from nuclear power plants. But the experience to date with commercial applications represents merely an infinitesimal fraction of a second compared to the nuclear advocates' dream of thousands upon thousands of years. In the United States, for example, our accumulated experience with 25 large (400–1000 Mwe) plants barely covers the anticipated operating life, 30-40 years, of a single plant! Moreover, today's plants provide no experience with the potentially more hazardous breeders upon which a long-term fission energy economy must be based.

Must we experience a disastrous accident to arouse widespread public concern and debate? Probabilities of catastrophic accidents are frequently quoted. How meaningful are they? Perhaps the answer lies in a recent response by Dr. Dixy Lee Ray, Chairman of the US Atomic Energy Commission, to a query on a nationwide television interview.[3] When asked how a massive leak of 115,000 gallons of high-level radioactive waste could have escaped over a period of 1½ months from a well-monitored, carefully supervised, strictly managed AEC storage facility before management took action, Dr. Ray's response was, in words that may go down in history as the epitaph of the nuclear fission energy era: "It ought not to have happened in the way that it did".

Notes and References

[1] "Nuclear Power: The Angel of Death", *Corporate Examiner*, October 1973, p. 3B.
The estimate of $17 billion for a single nuclear accident may be compared to the record-setting $3·5 billion in property damages caused by 48 major disasters in the United States in 1972.
Nuclear plants now being licensed have capacities of 1000 Mwe and above. Recently the USAEC imposed a limit of 1300 Mwe.

[2] "Social Institutions and Nuclear Energy", Alvin M. Weinberg, *Science*, 7 July 1972.

[3] "Face the Nation", Columbia Broadcasting System, 30 December 1973.

The Author: Dr. George L. Weil has been an eminent authority in the field of nuclear energy since 1940. A research associate of Dr. Enrico Fermi, he took part in the achievement of the world's firzt nuclear chain raction on the 2 December, 1942, and the first atomic bomb test in 1944. After serving with the United States Atomic Energy Commission, latterly as Assistant Director of the Reactor Development Division, Dr. Weil resigned in 1952. He has since been a consultant to the United Nations and the Technical Director of the United States team at Geneva at the first UN Conference on the Peaceful Uses of Atomic Energy. In this article, specially written for *Towards Survival*, Dr. Weil reviews the current situation.

Radical Reconstruction

Philip Toynbee

This article is based on the assumption that we are living in a period of imminent breakdown—social, economic, political, psychological and spiritual. It is suggested that neither of the political postures which we know as Left and Right are appropriate to this situation, but that there is something to be learned from both of them. The concept of "Reconstruction" implies a radical regeneration of our dying society, not by futile attempts to reproduce the conditions of another historical period, but by incorporating certain vital elements of the past in our present ways of thinking, feeling and acting. The Reconstructionist must be a student of history, in its widest sense: that is, of everything which can be known about what men have experienced before the present moment.

The past should never be patronised or underestimated, just as it should never be sentimentalised. Sentimentalisation has been perpetrated both by the "soft" Right and by the "soft" Left. "The Good Old Days?" "Who for?" is the proper riposte here. (And not "For whom?") "When Adam delved and Eve span/"Who then was the gentleman?" "Why *Adam*, of course!"—for male domination is at least as old as the race.

In other words, none of the Old Days were *good enough*. But it is no better to be a utopian than an arcadian; no wiser to believe in a futre Heaven-on-Earth than to pine for a lost Golden Age. (Nor, of course, is it any use being a Romantic Primitive: there is a nobility, even in savages, which modern man has lost, but there is no such thing as The Noble Savage.) The study of history reveals not a single just society, in any place, at any time. But individual injustices have been successfully fought, and more vigorously in our own time than in any other. Radical Reconstruction needs traditionalists who belong to this tradition. Dogmatic utopias are no good because history has shown that all human plans, even the wisest and best, produce unpredictable side-effects in the course of their execution. History has taught the Reconstructionist to be a perpetual but cautious experimentalist. (Yet present facts have also taught him that he must begin to make his experiments at once; and that they must be drastic as well as deeply-considered.) Fossilisation and frenetic change are equally destructive of the human spirit. ("For whom?" was rejected, above, because a living language cannot be fossilised by the pedantic dogmas of "correct" usage.)

* * *

Other things being equal we should love our own families better than any other; our own neighbourhoods best; our own countries best. For if you cannot love what is close to you your "love" for faraway places and people will be no more use than Mrs. Jellaby's. (Though there are, of

course, all too many cases where a man cannot love his family because he hasn't got one: where his neighbourhood is a foul, unlovable slum or a bleak and inhuman high-rise block: where his country has been deeply corrupted by some monstrous political regime.)

But even in ideal conditions—living in an affectionate family, in a friendly and beautiful neighbourhood, as the citizen of a tolerably decent nation-state—natural love should never be converted into famous and self-inflating adulation. It is right to be a patriot; absurd to be a nationalist; for no country is "the best".

* * *

Our attitude to our own time should resemble our attitude to our own country. It may not be the best time ever, but it is *our own,* and we owe it our prime duty and affection. This period, and its immediate future, are the only ones on which we can hope to have even the smallest direct effect. But just as we ought to look at other countries to find ways of improving our own, so we ought to look at other historical periods to find both warnings and examples.

The traditional fault of the Left has been to believe that everything always gets better: the traditional fault of the Right has been to believe that everything always gets worse. The "tough" left-wing posture leads, at its most extreme, to a de-humanising Progressivism, a modernist arrogance. It often leads to a philistine contempt for the past; a deracination as well as a reification of man. The "tough" right-wing posture leads, at its most extreme, to a hatred of every hopeful element in the present, for fear that it will upset the Conservative's psychological and/or material comfort.

The caricature of Left-wing Man—and there is no smoke without fire—is of an arrogant and inhumane social planner, who welds his statistical "facts" and his arbitrary theories into a monstrosity of social over-organisation, in which the individual human being becomes no better than a unit of population. Nothing is left to chance: very little is left to choice. The caricature of the Right-wing Man is of a retired and crusty tycoon who opposes all social reform in order to preserve and increase his hoarded wealth; who hates the young because they no longer "know how to behave"; hates the Lower Orders, Niggers, Foreigners . . . because they no longer "know their place".

The Reconstructionist does not believe that his own period is uniquely bad or uniquely good. He does believe, now, that it is uniquely unique. (If some animals can be more equal than others some periods can be more unique than others.)

* * *

The major virtue of our time is compassion, and a hunger, however desultory, for greater justice between all men and all races. The major vice of our time is greed, uniquely amplified by a blind confidence that it can go on being indulged forever. The unique social phenomena of our time are: the rapidity and acceleration of environmental change in the

"advanced" countries—and therefore an increasing gulf between the rich and the poor: on immediate threat to the *whole* world by economic, social and psychological breakdown: *but* the period's unmatched capacity for self-examination, and its technical ability to make sharp and sudden changes of direction.

* * *

The Reconstructionist believes, with the Left, that rapid change is inevitable and that it can be a change for the good. He believes, with the Right, that a great deal of recent change has been for the worse, and that if the world is to be saved from its galloping self-destruction we need to recover certain lost wisdoms of the past. For example, the Middle Ages were not that blessed period of "organic" order, natural piety and universal craftmanship concocted by the romantic medievalist. But nor were they the historical debunker's hell of brutality, bigotry, ignorance and filth. In the best centuries of the Middle Ages the elements extracted by the romantic were really there to be extracted. Can we recover those elements, in a form appropriate to our own time, without recovering the ignorance and brutality as well?

* * *

It is as philistine and idiotic to sneer at science as it is to sneer at religion or the arts. Technological "retreat" from an economy of indiscriminate growth can be accomplished by brilliant new feats of technology.

The recent and accelerated increase in the centralisation of economic power neither can nor should be abruptly reversed. Nor can it continue in its present form and direction without dehumanisation and disaster. A central government—ideally a *world* central government—must deal with the great central problems of economic resources and their just distribution. But man is naturally at home only in a small and largely self-governing community. Within the framework of central economic allocation—a framework which should be as imperceptible as possible—each small community must have the greatest possible freedom to decide how it wishes to live and administer itself. (An impossible combination? But an ideal to aim at.)

* * *

The Reconstructionist may or may not believe that the profit-motive is morally repulsive as a method of social propulsion. He is bound to believe that it has become economically disastrous. Yet he cannot be an implacable and unmitigated socialist since he is convinced that personal possessions—at least up to a level of a house and garden—are needed by most people if they are to lead satisfied and fully human lives. What is more, the abolition of the profit-motive in the self-styled socialist countries countries has led to very little in the way of Radical Reconstruction. (If we make a dubious and provisional exception of China this is because it is not yet clear whether her labour-intensive industry and provision of bicycles rather than motor cars are due to celestial wisdom or to reluctant

necessity. It is melancholy but undoubted fact that the Chinese government has been brutally obscurantist in its attitudes both to conservation and to nuclear disarmament.)

* * *

The more active members of the younger generation deserve to be respected for their determination to experiment, and for their profound dissatisfaction with *all* existing societies. The middle-aged and the elderly deserve to be respected for the understanding that they have acquired of the values inherent in stability and continuity; in seemliness and order; in the charm of the familiar. They are perfectly right to fear and hate the present fever for change as an end in itself. The young are to be envied in so far as they preserve the traditional but neglected virtue of hope. The elderly are to be envied for the melancholy and poetical passion of their nostalgia. (When Wordsworth looked back on the early days of the French Revolution and wrote "Bliss was it in that dawn to be alive" he perfectly combined the two essential emotions of (public) hope and (private) regret. The young are right to want to change society radically. The old are right to believe that many of these changes should take the form of restoration rather than further innovation.

* * *

But there is one vital respect in which the Reconstructionist can no longer balance the virtues and the enlightenments of Left and Right. Far to the left of almost the whole existing Left he is a radical egalitarian. He may be so by nature and on principle: but even if he is not, he nas been forced to adopt this position by the sheer dangers and demands of the present economic situation.

In wartime it was universally agreed by all morally-respectable British citizens that we should try to share the necessities of life equally among the whole population. Human nature prevented even *this* degree of equality from being achieved: and there was, of course, very little effort to share the available decorations and superfluous amenities of life. Yet the imminent economic breakdown *demands* that we should aim at a genuine equality of living standards, at least within any given national community to start with.

Nor does this mean a *proportionate* equality of sacrifice: i.e. if the rich man has to give up two of his three cars the poor man shall give up two of his three electric fires. It means that, in the face of universal and drastic shortages, men must learn to share the available resources with absolute justice between them. (What they *do* with their share will, of course, be entirely their own affair.) There will be gross abuses; a black market; persistent and evident injustice. But the only conceivable alternative to a determined policy of radical egalitarianism is a totalitarian plutocracy. We may safely predict that its life would be nasty, brutish and short.

But although a radical social revolution is an urgent necessity it will prove psychologically intolerable unless the past is treasured and honoured within it. We are right to be mistrustful of anyone who talks too glibly

about the future. We should never forget that the past *is*, while the future is nothing at all. A living tradition prohibits not only fossilisation but also reckless innovation—which many of the young propose—and thoughtless surrender to the inevitability of "progress"—which is still the attitude of the great majority and of nearly all their rulers.

If we are told by the planners that a beautiful medieval church must be demolished to make way for a new, necessary, handsome and well-planned housing estate we should treat the "necessity" with the deepest and most searching suspicion. But if we are convinced that the choice *must* be made we should unhesitatingly choose the housing estate. (No hesitation, but bitter regret.)

The Reconstructionist loves the English countryside and will do all in his power to preserve what remains of it. But he never forgets that the real problem of our time is concerned with urban life and how to make it tolerable. How, eventually, to make it fully human.

* * *

Every speculation about alternative societies deserves encouragement. Every experiment in new—or old—ways of living deserves sympathetic examination. The rural communes which are springing up all over Britain are signs of life and hope: perhaps they may turn out to be pilot schemes which will teach us, by their failures and their successes, how we can better accommodate ourselves to the coming "crunch". Everyone would be well advised to make his own immediate experiments in the pains and pleasures of premonitory austerities; in a life more fully shared within and between families; in attempts to do without the more absurd of contemporary gadgets; in a positive and creative simplification of life.

But none of this can hide the fact that we shall have to make our governments take drastic national, and international, action if we are to preserve and regenerate our small scale communities.

Highland Front

Roy Bridger

The ABC of peace

Even daily newspapers are a day late with the news, so how many world-shaking crises ahead will the monthlies' readers be on contributors catching the last post six weeks previously? Under the surface, however, the inter-related doomsday explosions continue to produce their nerve-racking chain reactions above it. The more people, the more disputes. The more energy reserves plundered, the more consumption of other non-renewable resources. The more credit facilities, the more buying of technological hardware. Including military hardware . . .

There have always been disputes. War is a constant, fought out with the most effective weapons available. The potency of weapons has always increased, thereby constituting an unmistakable challenge to the other side to go one better. Now that weapons are acquiring unlimited powers of annihilation, the sides themselves no longer count. They are at each other's throats in the Middle East. They have always been at each other's throats in the Middle East. The real war this time was between the missiles and the anti-missiles. What has not improved is the human element involved. The only fitting controllers of such marvels would need to be cut to a similar pattern of perfection. As it is, our fate rests on men of various degrees of imperfection, midget figures whose mental processes veer around like thistledown.

In 1945 the world situation changed as suddenly and as drastically as though we had all stepped on to another planet. Yet correspondingly drastic rethinking is still only minimal. It is true that the alphabet of peace appears at first sight to be distinctly *un*thinkable. A is for the Abolition of nuclear weapons, B is for the Banning of nuclear materials with a military potential, C is for the Conventional weapons everyone should stick to—but D is for Disarmament altogether, and before you get much further, you are theoretically committed to the elimination of all use of force, including the discreet exercise of it by the village policeman. A tall order.

But start again with the universal peasant ploughing his patient furrow across the world. It is the men without land, without contact with the rhythms and continuity of nature, who are swept to and fro like seaweed wrenched from its moorings by a storm. Moronic "football fans" are predictably throwing bottles in the "Development" Board's own Inverness now. A is for the Aiming of nuclear weapons at the ref.

Apart from that, great news. They are bringing wolves and bears back to the Highlands.

Poetry

THE TEMPLE OF TECHNOLOGIA

In times gone past our forebears by this stream
The goddess Technologia enshrined,
And came to her in waking-hours and dream
To tell her of the anguish in their mind:
On marble that in those far times surpassed
The morning snowdrop in its purity
Now is the modest sylvan mantle cast,
And Technologia mourns her decency.
The notes that hallowed once her pagan rites,
Though beautiful, shall not be hard again,
Nor would her priests who prayed on distant nights
Returning find her altar unprofane.
Thus Nature has revenge on every shrine:
They rise, they glory, then, eclipsed, decline.

Martin Wyatt

UNPLEASANT CERTAINTIES

Unpleasant certainties are no less certain
Because your pleasant minds deny them room.
Though you swish down the spangled, muffling curtain,
They crouch there, horrible, waiting in the gloom.
And though the auditorium may fill
With laughter (which a few must find surprising),
The curtain masks an alcove dark and chill:
Unpleasant certainties await its rising.

Why do you never notice where they are?
They poke you in the eyes, they hack your shins;
They stink and stain, and threaten us with war,
And mock us with their supercilious grins.
And this is sure: no matter how you may
Ignore them, they will never go away.

Eric Millward

Correspondence

The perceptive British

A funny thing happened on January 8th that is relevant to The Crisis, and what we should do next. On that day the *Financial Times* index closed lower than its lowest point in the previous cycle. This has never happened before. Another funny thing in the same schema is the fact that the vigorous, enterprising, level-headed and dauntless British have for sixty years been sliding backwards in relative economic wealth in spite of every physical reason for not doing so and after two centuries of relative advance. These two facts are from the medium and long-term economic cycles, the first being a strong and explicit confirmation of the second. They suggest a positive signal, albeit a subconscious one, that there is a collective British recognition emerging that the long-term bonanza is indeed over, and more over that an end to it is actually desired and willed. I float this possibility to spark interest in research among the writers on economic cycles to add to the weapons of persuasion that we must forge.

First we must persuade the entrenched capitalist system in terms that it understands, what it is that its own indicators are saying—that the collective subconscious is foreseeing, in capitalist expansion terms, 'the worst'. Second, we need to counter the inevitable euphoria of the next short-term phase of the cycle—upwards, with North Sea oil flowing, coal being shovelled out like mad, and even the nuclear fusers seeing light at the end of their tunnel. The economic establishment—left as well as right—must be persuaded first above all that a short-term victory is futile, indeed that the higher it flies the harder it will fall, and that it must adapt to the clear truth indicated by its own system. Otherwise our triangle will collapse for want of pins in the corners.

JOHN MORRIS,
"Owlzawake",
36 Brueton Avenue,
Solihull.

Significance of Current Warnings

The energy crisis is being discussed in isolation of other aspects of the environmental crisis. Immediate pressures are guiding political decisions to short term solutions (e.g. American reactors, maximum exploitation of Noth Sea oil). It is still taken for granted that maximum growth must be sustained as fast as fuel supplies will permit.

The essence of the limitations in the physical capacity of the earth to provide food, water, raw material and space, and to absorb waste, has not been appreciated. The effect of compounding increase in population and the expectation of improving material standards of living throughout the world, in expanding the demand, has not been adequately considered.

We are being committed to reliance on man-made monoculture and are ignoring the inevitable risk of reducing our options, of becoming vulnerable to anarchistic action which has already proved to be so effective in gaining sectional advantage. We are even becoming vulnerable to the annual climatic variation for food and water supply.

The 'tidy uppers' appear to have been side-tracked by non-essential and irrelevant influences. On the other hand, the *Limits to Growth* has stepped outside the realms of vested interest and limited horizons and has provided an admirable outline of the cause and effect relationship of current malaise. I see this as the most relevant and essential area for discussion. Unless political and commercial leaders are able to grasp the significance of the earth's physical limitations, and the inate limitations of man's goodwill, on his adaptability, and on his technical and organisational abilities, adequate solutions will not be forthcoming.

The co-operation required to provide for the world's expanding demands might well be sought through further bureaucratic controls, or by force of arms. At present I see the most likely long term outcome of the environment crisis in economic or armed dominance by one, or a group of nations, over the rest of the globe, along the lines of Aldous Huxley's *Brave New World*. If man's ingenuity and desire for dominance does not create such a world, the most likely alternative will be uncontrolled regression.

Survivalists are currently favouring a third alternative. It is to create a world wide harmony where sectional advantage is deliberately sacrificed for the benefit of the whole, in line with the concept of spaceship earth; we all sink or swim together.

However, before this principal could be universally considered it must be demonstrably shown that it would be to the advantage of all mankind. History has shown that man is unable to indulge in real sacrifice for the sake of general benefit. He will forgo self-interest only when a benefit is likely to ensure. (One accepts the rare exceptions.)

As yet man has not seen the significance of exponential growth. He is absorbed in self-interest, unable to appreciate the long term, world wide effect of his short term policies. There is no hope of a consensus of opinion which favours a genuine share-out of materials, abilities and responsibilities as the need for such dramatic adjustment is not seen to exist.

To be realistic in avoiding sectional domination or total regression we must attempt to show the world that the need to adjust many of our basic assumptions does exist. The question is not whether Maplin goes ahead or not, neither whether we adopt British or American reactors. It is: Are the warnings of the *Limits to Growth* true of false? (In principle as opposed to pedantic detail.)

Only the realisation of the ultimate significance of these warnings will be strong enough to cause a reversal of growth economics. Any steps taken outside the concept will have temporary, cosmetic effects which will further obscure the fundamental issues.

H. McE. SIMPSON,
68 Hardwick Road,
Streetly,
Sutton Coldfield.

Finances of TS

At this time of crunch for TS, I feel it is up to us, the subscribers—who after all should be prepared to give some voluntary backing to our convictions—to ensure that the present format of the journal is sustainable. It is this that will, initially, persuade the uncommitted to read what we have to say, for we live in a shamefully image-conscious age. The new image of TS must, therefore, be maintained.

Keith Hudson asks us all to enrol new subscribers—and this we must do—but there is one simple financial boost we could *all* give, now. When we renew our subscriptions, instead of sending £1.80, *let us make it £2*.

I feel this small extra sum would go unnoticed by most subscribers, yet would result in a useful total figure towards our cause at this difficult time. Although world events are proving us right, this is not the time to rest on our laurels—which are still only grudgingly conceded, anywav!

The idea is mine alone, and is admittedly 'inflationary'—but I hope all subscribers will consider it.

I am enclosing my cheque for £2 herewith.

ERIC MILLWARD,
Hope Cottage,
67 Hillside,
Horsham.

Cycling

I have read your article on cycling with interest. I would suggest that the reason that people do not cycle more is not that a bicycle requires effort, nor yet that it is relatively slow, but that it is completely lacking in weather protection. It is possible to dress up in cape, leggings and hat, and this is practicable for reasonably long journeys, such as going to work, but all that gear is a great deterrent if one just wants to nip down to the shops, hence the attraction of its major competitor, the motor car.

Do you know of any research that has been done into providing a lightweight shield or cabin type protection for bicycles.

P. G. WATTERSON,
67 Stirling Drive,
Bishopbriggs,
Glasgow.

Nuclear Reactors

On December 31 last year it was announced that the government is to spend a large sum on rapid development of nuclear fission reactors. I suggest that a Grandmothers' Club (not limited to grandmothers) should be formed to urge that not all the available money be devoted to a rush for energy for present use but that part (half? what hope?) be spent on research into how to make the resulting environment safe (in respect of peaceful use of reactors) for succeeding generations.

This means permanently safe disposal of waste, safety from accidents within or without the reactors and their surrounding premises, and from deliberate sabotage, hi-jacking and spot attack from sophisticated long range weapons.

Also what is needed is some attempt to assess the probable acreage needed for dwelling and food production and the acreage to be covered practically permanently by active and inactive (but still toxic) reactors in, say, 50 years' time and onward.

ALISON FOSS,
Glendarroch,
Dalry,
Castle Douglas.

Reviews

Toward a Steady-State Economy. Edited by Herman E. Daly. (W. H. Freeman and Company. £1.70).

This is a collection in a well printed, compact and durable form of sixteen essays containing among them those which have had the greatest and most formative influence in starting the thinking about the economics of survival. It is something everyone interested in the subject will want to possess and keep. It contains Garrett Hardin's *The Tragedy of the Commons,* Kenneth Boulding's *The Economics of the Coming Spaceship Earth,* Georgescu-Roegen on *The Entropy Law and the Economic Problem,* and for variety E. F. Schumacher on *Buddhist Economics,* besides an essay by Daly himself who also contributes useful introductory material.

It is a collection which points the way but a thoughtful reading will show what a long way there is to go. All this discussion of the steady state derived from J. S. Mill is no more than the guide lines drawn on a board for an exercise in sociological perspective. They do not show the sort of buildings we shall have to erect or how hard it will be to clear the ground.

The last essay is different. It is C. S. Lewis reflecting without Christian references on the nature of man's own influence on his own future. This is something that will dwell in the mind.

G.N.H.

Inquiring Man: The Theory of Personal Constructs by Bannister & Fransella. (Penguin, 50p.).

A condition for survival, all agree, is a change of mind: a transvaluation of values across the board. We all say this, but we don't think enough about *how* minds change, when they do. *Inquiring Man* is all about the way minds change. It is a sort of fighting introduction to 'personal construct theory', the school of philosophical psychology founded by the American generalist, the late George Alexander Kelly, sometime professor of psychology at Ohio State and Brandeis. In my opinion, he is the only American philosopher/psychologist since William James worth serious study. Bannister, an Englishman, is Kelly's most able follower and expositor.

As a sample, consider the idea of 'slot movement'. We all tend to shuttle back and forth between two poles of a one-dimensional argument: thus, if not boom, then doom; everybody must be either a boomster or a doomster. Kelly would have suggested that we get out of this 'slot' by 'rotating the axis': say to a dimension with quality at one end and quantity at the other. Highly recommended.

G.L.

Getting Back Together by Robert Houriet. (Abacus, 75p.).

This book is a brilliantly written account of extended visits to nine very different 'alternative life-style' communities in the United States. But it is much more than this. It is a report on a generation trying to escape from 'the megamachine', trying to free their lives from a subservience to industrialism. In many ways it is discouraging, because for these pioneers, the way has been hard. They have had to struggle against their own inadequacies —few of them have the skills, stamina and organisational ability needed to return to a less mechanised, more local way of living, let alone to go on to develop an 'eco-technology' that can bring a new balance with nature. But from his survey of these experiments, those that collapsed under internal or external pressures, and those that have achieved some degree of stability and continuity, Robert Houriet has been able to distil a great many insights, amounting in the end to some valuable guidelines for new 'alternative communities', including his own, initiated in Vermont at the time the book closes (1971).

For those who approach 'alternative communities' with a prime concern for ecological stability, the book includes much discussion of attitudes to technology, and the way these were modified by experience. Many communes, Houriet says, "initially rejected technology *in toto,* making little discrimination between the tools that liberated and those that enslaved". "They went back to the past for tools". But they were not usually able to re-assemble all the skills of local self-sufficiency, and many "easily sown" gardens ended as "cellars full of rotting vegetables. However, this is far from the whole story; much of the book is inspirational, and helps to show how it may still be possible to find ways through the present critical era to a new way of life, more in harmony with nature, more fulfilling of human needs.

R.F.

Books Received:

Be Human or Die: A Study in Ecological Humanism. Robert Waller. (Charles Knight £4.50.) (To be reviewed next issue).

Your Daily Food: Recipe for Survival. Doris Grant. (Faber and Faber, £2.25).

Control of Air Pollution in the USSR. N. F. Izmerof. (World Health Organisation, Geneva, £1.35).

The Geography of Pollution: A Study of Greater Manchester. C. M. Wood, N. Lee, J. A. Juker, P. J. W. Saunders. (Manchester University Press, £2.00).

Free World. Aami Wisdore. (Free World Publishers, Oslo). (Free).