



*The new Knightsbridge Barracks
under construction at the
Southern edge of Hyde Park*

Photography by Grahame Leman

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TOWARDS SURVIVAL

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Information for Survival Digest

18 DECEMBER
1973

Politics of Survival

Windmills

Scottish Peat

An Arab-Israel Project

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Editorial 1

Articles

- Some Political Aspects of Survival 2
Margaret Laws Smith
- Wind as a Power Source *F. P. U. Croker* 5
- Scottish Peat *T. F. Scott Hetherington* 9
- Desert Reclamation for Middle East Peace 13
Robert A. de J. Hart
-

Information for Survival Digest 17

- Poetry 21
- Doctors and the British Malady of Overpopulation 22
Dr. John A. Loraine
- Highland Front *Roy Bridger* 23
- Correspondence 24
- Reviews 26
- Announcements **Back Cover**
-

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TOWARDS SURVIVAL

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Editorial

A mere three weeks after the start of the Arab-Israel war the quantity of Arab oil entering the world market has fallen from 19.5 to 16 million barrels a day and many nations are already in a state of alarm. In the US the White House has confessed that it seriously underestimated the shortfall and emergency powers are being sought. Supplies to Japan, already reduced by the leading oil companies, are to be cut back in a second wave. Europe too is in a sorry state with individual oil rationing plans being prepared in most countries, though joint pooling arrangements have not so far been agreed by the EEC for fear of further Arab retaliation.

All these events have been further complicated by a critical domestic situation in the US in which Nixon is fighting a lonely battle to retain a Presidency discredited by Watergate and other corruptions of his recent administrations. This atmosphere is not conducive to wise decisions and already he has caused a highly dangerous situation to develop when he placed 2,000,000 US servicemen round the world on stand-by alert on the basis of sketchy evidence. Mercifully, this incident soon passed over and the high point of the Russians' anger has subsided.

It would be rash to make any firm predictions about events even over the few days between the writing of this page and its publication. Nevertheless a broad suggestion can be made:

This is that if the Arab countries, who are now meeting, decide to increase their oil embargoes then the non-communist world would be brought to its knees within two or three months. For this reason it is highly unlikely that further restrictions will be allowed to happen. In theory the USSR ought to be delighted that the end of capitalism is in sight but in practice she would have much to lose too. We have seen in the last two years an increasing number of trade agreements between the US and the USSR on grain, metals and natural gas, and over the next few years this interdependence will grow. The USSR badly needs high technologies and development capital and the US needs large quantities of resources in return. The likelihood, therefore, is that the super-powers will impose a solution on the Middle East even if it is not to the liking of either the Israelis or the Arabs. The oil will be kept flowing.

A consequence of this sort of solution is that it is probable that the relationship between the US and the USSR will be firmer than ever. Moreover, once they are in control of the Middle East then they are likely to remain so because both countries will want to ensure that their own growing oil needs are met. This development must be to the ultimate disadvantage of Europe. An economic downturn must lie ahead of us. It will probably not be sudden but it will be inexorable and the sooner we plan for a steady-state economy the better.

Some Political Aspects of Survival

Margaret Laws Smith

As the impact of our increasing numbers and technology on the limitations of natural resources produces more and more economic problems, and we all become more aware of the relation between them, our ideas about morality and political organisation will change. The long run economic problems of survival will be concerned with how much land or minerals or energy sources are to be used for this or for that, and those problems will have to be solved within the political structure which is set up to control and regulate the use of those resources. Therefore I feel that an article on the possible nature of political controls is necessary before I continue to discuss economic problems further.

The realisation of the absolute scarcity of land and minerals will bring first an extension of morality into another dimension, and then changes in law based on that new morality. This may demand changes in the law making process itself, and will demand the creation of organisations for administering and enforcing these laws.

The new dimension of morality will represent the feeling that the lives of all of us who live together in one area of land depend on the right use of that land and the minerals it contains, and that that right use is something which is basic to every other problem of living.

Hitherto in western history law and justice have been concerned with the rights of *persons* in land, and the rights of individuals in relation to one another. But when the necessity of adapting ourselves to the earth's limitations has really sunk into our collective consciousness, laws regulating the conservation of natural resources will have prior importance because the continuance of life will depend on them, and the regulation of personal rights will become subordinate.

Natural resources are of two kinds—agricultural and mineral. They pose different problems and it is the latter on which I am concentrating here.

The problem in the use of mineral resources is how much of a fixed stock it is permissible to use now, recognising that every use is, at the expense of some future use.

The morality of survival is that we must not benefit in the present at the expense of the future. Nothing must be done now which will make the future more difficult because if we go on in this manner problems will accumulate at a later date which will become insoluble. If that principle is to be translated into law the guardianship of scarce resources become a fundamental part of the total political constitution.

In this country we are accustomed to an unwritten constitution. New statutes can be passed by any Parliament at any time altering any laws previously passed. At the present time with the emergence

of the two party system laws covering absolutely any matter can be passed by the Government in power which dominates Parliament. Both parties are predominantly concerned with short term issues. The Conservatives are concerned with growth. The Labour Party is also concerned with growth, but it is also committed to changing to some degree the ownership of industrial capital from private to state hands. Therefore we have the rather ridiculous situation in which an industry nationalised by one government can be denationalised by the next. Both parties are concerned with their prospects of survival as successful politicians at the next election all the time they hold office, which means avoiding disaster and maintaining prosperity in the immediate present, so that they will attain another period of power.

Thus the big political problem of the conservation of scarce resources is to ensure that control once instituted cannot be subverted to serve short term greed and interests. This has two aspects: 1 legislative, and 2 administrative and judicial.

1 Once legislation devising means of control is passed we need means of ensuring that it cannot be too easily (and I say too easily, I do not say never) altered by a new act because that act might be passed by a new government intent on its own short term credit with the electorate.

In America there is a written constitution which limits the scope of the ordinary legislature. Amendments to the Constitution itself have to be made by a more elaborate process than is required for ordinary laws, and the legality of any law can be pronounced on by the Courts.

When the facts of survival have sunk in, and we know that life depends on the enforcement of the morality of survival, we may decide that acts providing for the regulation of the use of scarce resources are in a special class. Therefore we may decide that we need a special procedure for passing them, and more particularly for altering them when passed. We may need something in the way in which America has special processes for amendments to the Constitution. There is some interesting but tough thinking here for political and legal specialists.

2 The organisations for control set up by legislation must be designed as far as is possible to ensure that they cannot be twisted or mis-used to serve short term purposes. This means ensuring their independence of the Government of the Day, besides ensuring against the ordinary hazards of bribery of officials. This means that their administration must not be in the hands of a ministry or Government department. It will not do to vest their ownership in the Department of the Environment.

The Labour Party set up the D. of E. thinking that if all matters regarding the environment were brought together in one ministry it would be a guarantee that all receive due care and attention. In fact it has increased the power of the Government to override every

consideration of environmental matters except the one in which it for the time being interested.

Parliament by whatever process of procedure is determined could enact the transfer of ownership of resources to the community, and set out the details of the organisation which is to act as trustee for the community, and the Principles on which it is to proceed in granting or withholding permits to government departments or other organisations or individuals to proceed with mining operations.

Even the drafting of these Principles would hardly be possible at the moment. They could only come from people who when they set out to write felt they were expressing what was indubitably right, morally right, about the way they should be used, the necessity of conserving an adequate portion for the future, and the absolute wrong or evil of any attempt in the present to cripple the future or resent advantage. The Principles largely dealing with the permissible rate of usage must come out of the moral feeling of the community.

The organisation of guardianship set up would have to be an expert body, but the interests and professional success of the persons composing it should depend absolutely on their care and integrity in their interpretation of the Principles laid down in legislation. This should be the protection against subversion.

This could only be so if there was a judicial authority before which the legality of their decisions could be questioned. It should be possible for cases against them to be brought by organisations and individuals who felt they had been unfairly treated, including government departments, and for cases to be brought on behalf of the community if it was felt that their interpretations of the Principles were too favourable to certain interests. The Guardians' organisation would then have to defend its decisions in public and their personal success and reputation would depend on how many cases they won, and thus their success in life would depend on the perfect justice with which they interpreted the Principles of the Government overruling their work, not in their subservience to any interests even those of the Government.

How elaborate would the court have to be? Would one judge be sufficient, or should it be an expert tribunal, or should the judge act with expert assessors? It depends on what is necessary to be felt to be fair, and to be seen to be fair and incapable of being subject to any outside influence, even that of the Government of the Day.

In England we have had a jury system for centuries. It is part of our history. We might adapt this to our new problems and have each case referred to a jury. The great advantage of this is that the judge must sum up each case very carefully and state the issues very clearly on which the jury must decide. It would require clear thinking by ordinary people, but then survival is not a matter for the experts.

It is a matter for ordinary people. Its essentials have to be realised by everybody, understood by everybody, and accepted, however much they are disliked, by everybody.

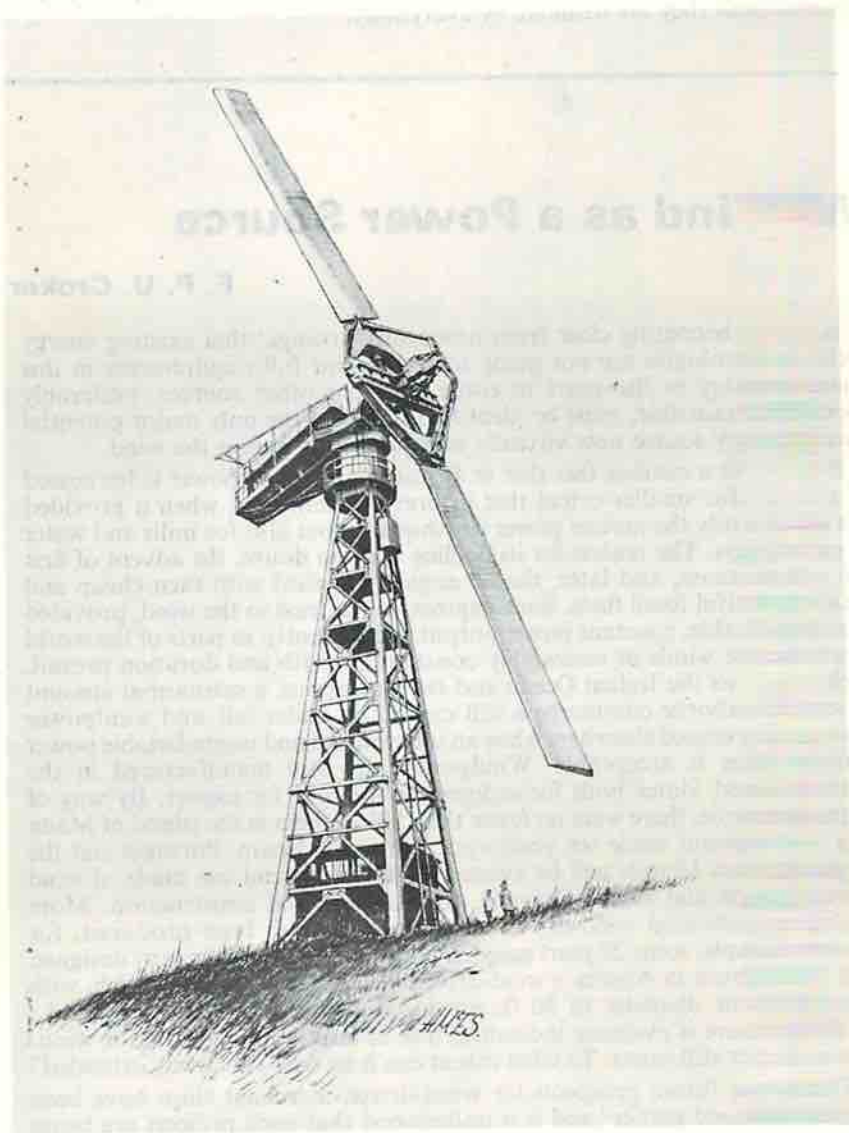
Wind as a Power Source

F. P. U. Croker

It is becoming clear from numerous writings¹ that existing energy technologies are not going to supply our full requirements in this country in the years to come and that other sources, preferably inexhaustible, must be identified. Of these the only major potential energy source now virtually untapped in Britain is the wind.

It is a curious fact that in Britain today, windpower is harnessed to a far smaller extent than in previous centuries, when it provided not only the motive power for shipping, but also for mills and water pumps. The reason for its decline was, no doubt, the advent of first the steam, and later, the i-c engine, supplied with then cheap and plentiful fossil fuels. Such engines, in contrast to the wind, provided a reliable, constant power output. Significantly, in parts of the world where winds of reasonably constant strength and duration prevail, such as the Indian Ocean and the Caribbean, a substantial amount of seaborne commerce is still carried on under sail, and windpower is harnessed elsewhere when an intermittent and unpredictable power source is acceptable. Windpumps are still manufactured in the United States both for indigenous use and for export. By way of example, there were no fewer than 503 of them in the island of Malta at a count made ten years ago. Visitors to Spain, Portugal and the Aegean Islands will be aware of the widespread use made of wind pumps and mills of simple, local design and construction. More sophisticated wind-driven machinery has also been produced; for example, some 20 years ago, the Hawker-Siddeley company designed and built in Algiers a wind-driven electricity generator which, with a rotor diameter of 80 ft, produced 100KW in a 30 mph wind.² So there is evidence indicating that at least a limited role for windpower still exists. To what extent can it be cost-effectively extended?

The future prospects for wind-driven merchant ships have been discussed earlier³ and it is understood that such projects are being actively considered in Germany and the United States. At the peak of her development, represented by the German five-master *Preussen* built in 1902, the sailing ship reached a loaded displacement of 11,000 tons and could carry 8,000 tons of cargo at speeds up to 17½ knots—as fast as today's giant tankers. On land, however, wind



This 175ft 1250KW test unit at Grandpa's Knob, Vermont was built in 1945 after 6 years of development based on the original proposals of Palmer Cosslett Putnam. At the time it was considered that similar production windmills would be economic but the companies concerned did not have sufficient capital to take the idea further.

power has only been harnessed hitherto on a relatively small scale. Moreover, windmills have not in general been designed primarily to achieve maximum aerodynamic efficiency, and partly for this reason have been of excessive size for the power developed; so in an era of cheap fossil fuels, the benefit of a free energy source tended to be outweighed by the cost of the windmill.

Some idea of the magnitude of the problem of deriving a worthwhile fraction of our energy requirements from the wind may be gained by considering the consumption of electricity of a medium-size city such as Portsmouth (with about 20,000 inhabitants, a naval dockyard and some light industry) which, at peak hours, exceeds 100MW. To generate 100MW by windpower assuming, somewhat optimistically, the Hawker-Siddeley yardstock of a 30 mph moderate gale, would require no fewer than 1,000 of their Algiers windmills. If, by way of illustration only, these were disposed in a rectangular block of 25 rows of 40 units, with a unit spacing of 220 ft, the installations would measure over a mile and a half in length by a mile in width. If, alternatively, the windmills were disposed in a single line, spaced at only 100 ft, they would stretch for nearly 19 miles. Imagination boggles at the idea of substituting wind for oil or coal-fuelled generation in the largest power stations now planned, of some 4,000MW capacity!

Concentrating, however, on the more modest demands of cities such as Portsmouth, it appears that the Algiers windmill had an energy conversion efficiency of only 25% of the theoretical maximum, and there is reason to believe that, with further development, this could be improved to as much as 50-60%. In this case, it should produce over twice as much power, so fewer than a half of the number of units would be needed. Design for high conversion efficiency therefore represents the first step on the path to economic feasibility, but there is still a long way to go.

The material and manufacturing costs, even by mass production, of so many units would be high, though possibly acceptable in a world in which energy itself had become a high priced commodity. Therefore, additional ways of increasing windmill output must be devised, and some of these will be discussed in a later article.

The siting of windmills is important, and calls for specialist meteorological advice. In general, higher wind speeds will be found over hill tops and ridges, especially where these are well rounded, and seashore sites are also advantageous, both because of the smaller surface friction over water, and the prevalence of sea breezes, even when the atmospheric pressure distribution indicates calm.

Improved windmill efficiency must, however, be carefully weighed against overall cost, as it is useless to reduce the number of units if research and development, manufacturing complexity and more expensive materials together result in a higher bill than for a larger number of less sophisticated and efficient units producing the same amount of power. But any nationwide windpower project will call

for a very large number of windmills, so the r and d would be thinly spread, and should not therefore represent a large fraction of unit cost, even if undertaken by the aircraft industry, which is traditionally expensive. So there are grounds for hoping that efficient design is not incompatible with low unit cost, provided that the need for rugged simplicity is borne constantly in mind.

The other major problem is the intermittent nature of windpower and the large variations in its strength. The latter necessitates some means of "shortening sail", since a windmill which performs efficiently in moderate winds, when it will require a large area of blading, is likely to be destroyed in a storm, bearing in mind that the wind force varies as the square of its velocity. There are several possible solutions. Partially feathering the blades is one, but this involves an expensive variable-pitch hub; rotor 'coning' is another, or the blade area itself may be variable.

At the lower end of the wind scale, evidently nothing can be done to extract power from a windmill in a flat calm, nor will it produce much in light breezes. There appear to be two ways of dealing with this drawback—either to restrict windpower to applications in which an unpredictable variable output is acceptable, or to convert it, when available, into potential energy of another kind. As an example of the first, windpower could be usefully harnessed to generate electricity for the electrolysis of water and production of hydrogen. This is likely to be important, since hydrogen in liquid form will probably be the replacement for oil-derived fuel for aviation and long-range road transport.

The transformation of windpower into potential energy can be accomplished by using it to pump water to a higher level, from which it can be run back through a turbine delivering constant power for as long as the water supply continues, as and when required. In smaller applications, heavy weights could be lifted which, in their subsequent descent, would drive a power shaft.

It is worth remarking that in a nationwide windpower system it is highly unlikely that a flat calm will ever prevail over the whole area, so some power will always be forthcoming which can be fed into the grid. Secondly, peak loads are only imposed for limited periods: at other times demand may be much smaller. Thus, in association with pumped storage, it will not be necessary to provide windpower generating capacity to meet these peaks. This situation may, however, change in the future if a sizeable proportion of road vehicles, especially short range, should be battery powered, since the main re-charging demand will be at night, evening out the diurnal load.

Power from the wind has the prime advantage of a free energy source, and this will clearly become of ever-increasing importance as fossil fuel costs escalate. Moreover, the source is inexhaustible, clean and environmentally acceptable.

This article has given some idea of the part which windpower

could play and the problems which harnessing it present. It may, at first sight, seem premature to initiate such a project but r and d, construction and testing of pilot systems and final implementation of so large an undertaking will all take time, and there may be little time left. It is, in any case, likely to prove of far greater relevance to our economy than lunatic prestige projects such as Concorde and Maplin airport.

References:

- 1 e.g. see Supplement to *Towards Survival*, November 1973.
- 2 Since writing this, I have come upon some more ambitious modern windmills, e.g., the Smith-Putnam design with a rated output of 1.25 Mw erected during World War 2 in Vermont, USA, and, in Britain, the design study by the Folland Aircraft Co. sponsored by the Ministry of Fuel and Power, for a rated output of 3.67 Mw. (See "The Generation of Electricity by Windpower" Table XXXII—a thorough, lucid and strongly recommended work by E. W. Golding, published by Spon in 19 5.)
- 3 Croker, F. P. U., "New Wings for a Phoenix", *Towards Survival*, August 1973.

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Scottish Peat

T. F. Scott Hetherington

As Britain shivered amid coal shortage and power cuts in the winter of 1947 some envious glances were cast across the Irish Sea where, deprived of coal during the war, the Irish Government had undertaken extensive development of peat as fuel. Scotland had large peat bogs, so a Committee was set up to see if we could follow the Irish example. The chairman was Edward Appleton, Principal of Edinburgh University and former secretary of the DSIR. Other members included Edward MacColl, deputy chairman of the Hydro Electric Board, Anders Tomter, a Norwegian who had worked for many years with Peco in Dumfries-shire and is still the world's leading peat technologist, Campbell Secord, a Canadian economist working with the Cabinet Office and a Himalayan climber, four Professors of Engineering and various other distinguished people including a senior executive of ICI.

Attention concentrated primarily on the use of peat as fuel, although it has a variety of other uses, e.g. as a soil conditioner or for extracting wax for shoe polishes and the like. Experience not only in Ireland but also in Scandinavia, Russia and elsewhere had shown that it could effectively be used either for power stations or as domestic fuel. But there was not a lot of it. About 1.7 million acres, or one tenth of the land area of Scotland consists of peat bog. But only about a third of this is capable of large scale exploitation and contains about 600 million tons of solid matter, equivalent to about 500 million tons of coal, or enough to run power stations of 650MW for about 25 years. But even if small in quantity compared with coal, oil or water power, peat could still be useful.

The second question was whether peat fuel could be economic since it was thought that post-war scarcity of energy sources in Britain would soon disappear. This brought up the basic problem of peat fuel technology, getting rid of the water. Raw peat contains 90 to 95 per cent of water. This has to be brought down to about 50 per cent at which it has about a third of the calorific value of coal, or preferably to 30 per cent where the calorific value is about half that of coal. All this means getting rid of some nine tenths of the original water. The traditional method is to dig out peat sods and spread them on the bog surface to be dried by sun and wind. This is very costly in seasonal labour and dependent on good summer weather since drying takes several weeks. The only completely mechanised peat winning process developed at the time the Scottish Peat Committee started their enquiries was the milled peat method pioneered before the war by Peco in Dumfries-shire, and extensively developed in Russia and Ireland since. The peat is mown off the bog surface by a machine like a large motor mower, ruffled by harrow, the small particles left to dry on the surface for two days or so and then ridged into heaps. Given two good days' drying the moisture is reduced to about 55 per cent, at which the peat will burn in a power plant, or alternatively can be further dried and processed into briquettes.

However, milled peat has its limitations. It requires large flat bogs of even depth, and it was by no means sure that Scottish summers would provide enough drying days. So the Peat Committee felt they must look for something which would eliminate the seasonal element altogether. This led to two novel ideas. The first, the inspiration of Secord, taken up enthusiastically by MacColl, was to burn peat in gas turbines. It was hoped that enough exhaust heat would be available from the turbines to dry peat from about 70 per cent moisture which would be a great advance on anything previously achieved. So contracts were placed with John Brown's at Clydebank for a closed cycle turbine and with Ruston and Hornsby of Lincoln for an open cycle turbine. In the first, clean compressed air would be heated in tubes in an air heater and released into the turbine chamber and expanded to drive the turbine; in the second the products of combustion would actually enter the turbine.

The next point was, however, that even if the turbines could take peat of 70 per cent moisture, the raw peat had to be got to that state. Tomter, aided by the Professors, came up with a promising idea here. Experiments in Germany had suggested that if shredded raw peat was coated with peat dust previously dried to about 10 per cent moisture and the mixture subjected to pressure, the resulting press cake could be brought down to 55 to 60 per cent moisture. At this level the turbine exhausts might dry enough peat not only to keep themselves going but also to provide dust for the mixback. An experimental plant was set up at Gardrum Moss, near Falkirk, and under Tomter's direction intensive work was done on mechanical excavation of raw peat and pressure de-watering.



By the summer of 1953 results from all this preliminary work were considered sufficiently promising to proceed a stage further. The Development Commissioners, who had financed all the previous work, agreed to provide most of the capital cost of an experimental 2MW closed cycle gas turbine power station at Altnabreac, Caithness, to be run on milled peat. This would test out milled peat production in a Highland area of heavy unemployment and the potential of the turbine. It was hoped that the open cycle and pressure de-watering would make sufficient progress eventually to be included in the complex and that an important contribution to Highland development might result. These hopes were not to be fulfilled. It was proved that milled peat could be successfully produced in Highland conditions. But the turbine never attained its planned output because of a variety of problems, including the effect of ash deposition on the heater tubes. The open cycle ran into similar difficulties of fouling and corrosion on the turbine blades.

Pressure de-watering was proved at Gardrum to be technically successful but likely to be more expensive than milled peat. The opinion of the experts was that given sufficient time and money all the problems could be overcome. But the fuel and power situation as it then stood was not considered to justify the money. The work of the Appleton Committee terminated in the early 1960s.

In retrospect it is easy to see that the mistake was perhaps to attempt too many novelties at once. Pressure de-watering was sufficient of an assignment in itself without adding a largely untried

time mover, at least for solid fuels. We could well have got Scottish at off, or out of, the ground if we had stuck to established techniques of steam power stations or briquetting or a combination of the two. The Russians are apparently still using peat, probably dried peat, for between 4 and 8 per cent of all their power stations. They were recently reported to be building a 375MW peat power station in Bulgaria. Given a choice, coal, oil or water power may be cheaper than peat. But it does not look as if we shall long have a choice. We shall need all the energy sources we can get. The work of the Scottish Peat Committee will then prove its worth.

In the survival context there is another and perhaps even more important point: the possible use of the peat bogs to produce food and timber. All along the Scottish Peat Committee envisaged that once the peat had been extracted for fuel, the subsoil could be reclaimed for agriculture or forestry. In other words, if you develop the peat bogs you do not disfigure or pollute the environment; on the contrary, you improve it. As long ago as the 18th century Lord James created some of the most fertile agricultural land in Scotland, the Carse of Stirling, by stripping peat off part of the Flanders loss and floating it down the Forth. Apart from the possibility of reclaiming areas cleared or substantially cleared of peat there is the alternative of bringing bog surfaces directly into cultivation or restock rearing. About a million acres of Scottish peat are in any case too shallow or uneven to be capable of fuel development but would have a great potential for farming or forestry. Some years ago the Irish Sugar Company acquired 3,400 acres of deep wet bog in Ulster which was to be reclaimed by drainage, rotovation, treatment and seeding for the production of grassmeal, grazing 3,000 sheep and eventually sugar beet. A number of areas in Scotland have been successfully reclaimed by the Macaulay Institute, the Agricultural Colleges or private enterprise. In recent years Anders Tomter has directed the reclamation of some 300 acres of peat land for agriculture or recreational purposes in West Lothian. If we want to go on eating meat we must have more cattle and sheep, and since we cannot afford to divert the more fertile land from cropping we must make more intensive use of marginal land. We can grow grass on the peat to feed the beasts; better still, we can stock the hill grazings more heavily and use the peat areas to grow winter keep. The Scottish Peat Committee calculated that reclamation of some 2,000 acres on the Flanders Moss could support ten farms with an annual output of 5,000 tons of oats, wheat, barley and straw. The Forestry Commission have shown that trees can be successfully grown on shallow and even sometimes on deep peat. And all this can go a long way to remedy rural depopulation. The 12,000 acres of Inverclyde, if fully developed, could support 80 farms sustaining, with forestry, a total population of 400.

So the latest peat chapter may be finished; the story is not.

Postscript. I have left unaltered in the text the references to Anders Tomter, the guiding genius of all recent peat developments in this

country, who died suddenly on 11 October 1973. This article thus becomes a tribute to a great friend who helped me to write it. It mattered not at all to him that he was never likely to make a fortune out of peat; perhaps not greatly that the cause was not likely to succeed in his lifetime. What mattered supremely was that it was a worthy cause to which he could and did dedicate in full measure his prodigious energy and talent. We shall badly need his kind in the survival society.

Desert Reclamation for Middle East Peace

Robert A. J. de Hart

One of the main causes of the perennial Arab-Israeli conflict has been shortage of living-space. Both Israel and Egypt are lands with a high proportion of desert, whose populations have throughout history been crowded into confined spaces. But within the last twenty years both countries have launched schemes of desert reclamation of far more than regional significance. It seems tragic, therefore, that they should waste vast resources for purely destructive ends instead of devoting them to constructive purposes, in which both have expertise and which would benefit other countries as well as themselves. In a logical, reasonable world, Israelis and Egyptians would be co-operating to provide decent living conditions for deprived people of their own area and their own ethnic groups, such as, above all, the Palestinians, whose life in the limbo of refugee camps has bred terrorism and hi-jacking.

Over one-third of the world's surface is taken up by deserts, many of them man-made—caused by wind-erosion following uncontrolled grazing—and some of them expanding. In view of the population explosion, sooner or later it will be essential to find means of making many desert areas fit for large-scale human habitation. Both Israel and Egypt have done pioneer work in desert reclamation whose example other countries could follow.

Everyone knows about the vast Aswan dam built by Egypt with Soviet aid with a view to bringing six million acres of land into agricultural production by irrigation, though not everyone is aware of the dangers and disadvantages connected with big dams. An American hydraulic engineer has written a book called *Big Dam Foolishness!* Other less well known and less colossally expensive schemes carried through by both Egypt and Israel are likely to be of greater exemplary significance to other countries anxious to tame their arid areas.

Over 60 per cent of the land of Israel, before the acquisitions of the Six Day War, was taken up by the Negeb, the long narrow triangle of desert between the Dead Sea and the Red Sea. Despite the harshness of the conditions, the population of the area increased 13-fold to 189,000, between the establishment of the State of Israel and 1970, and there is now a University of the Negeb. This has been made possible largely by conveying water from the Sea of Galilee, in the far north of the country, through an elaborate system of pipes, canals and tunnels known as the National Water Carrier. But much research has also been done into the development of local underground water resources and into the possibility of trapping every drop of the area's meagre rainfall. Much of the water in the region's aquifers—subterranean lakes—is brackish, so it has been necessary both to explore economic methods of desalination and to experiment with salt-resistant and drought-tolerant crops. In particular large numbers of fodder bushes were imported from arid areas of Australia and America, and these have made possible the re-establishment of livestock farming in the north of the Negeb on a scale unknown since Biblical times.

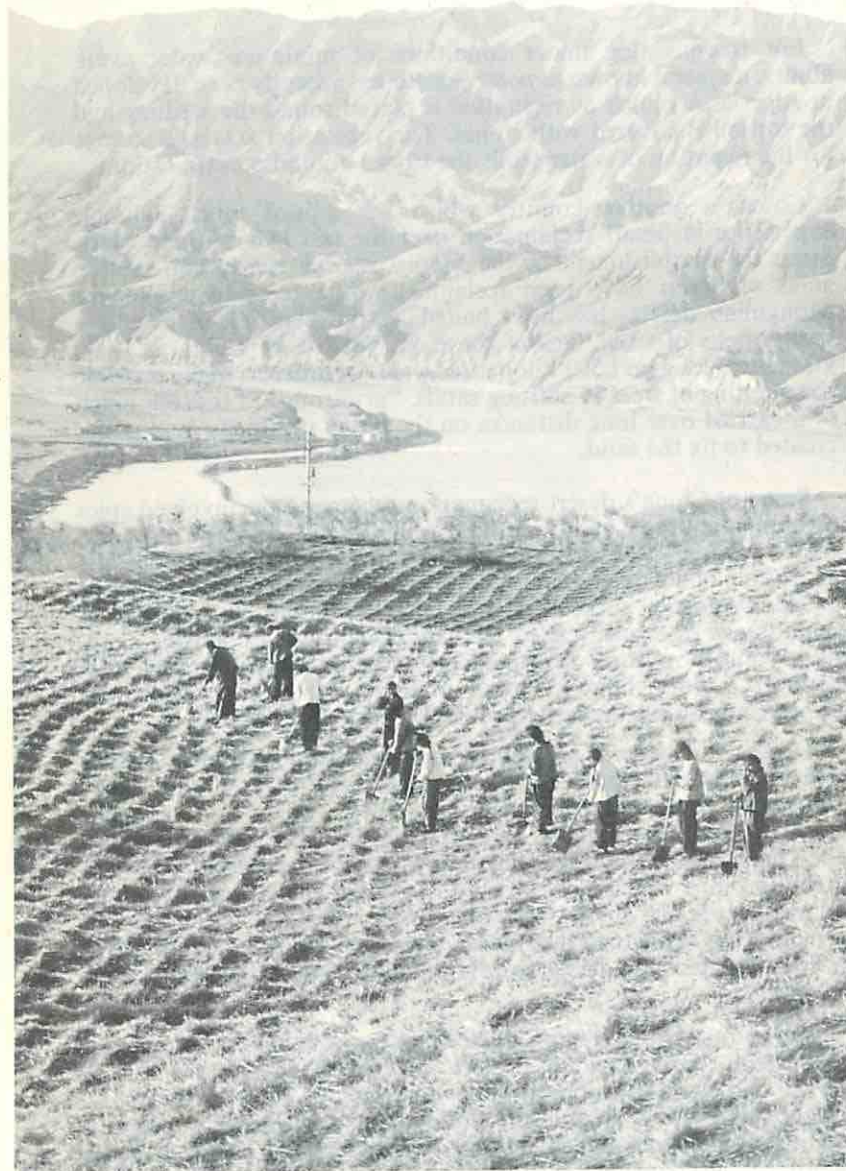
Professor Even Ari of the Hebrew University, Jerusalem, has revived a method of capturing rainfall first devised by the Nabateans, an ingenious trading people who flourished in the Northern Negeb around 2,000 years ago. By creating micro-catchments and directing the rainwater falling on them to individual trees, it has been possible to produce, in one of the harshest Negeb areas, orchards of peach-trees, figs, apricots, almonds and olives as well as vineyards. A similar scheme has recently been launched, with West German aid, in a desert area of Afghanistan.

The Egyptians have also exploited resources and techniques employed in Classical times. An extensive area of the Western Desert around El Alamein has been reclaimed, largely with the assistance of stone cisterns for capturing rainfall which were constructed by the ancient Romans.

Under Nasser, large-scale colonisation projects were launched both in Egypt's Western Desert and in the Tahrir or Liberation Province to the South-West, which has been watered by a wide irrigation canal from the Nile, the subsidiary channels of which were stocked with fish.

Elsewhere in the Sahara area, pilot projects have been launched in several countries in response to Richard St. Barbe Baker's call for a "Green Front" against the desert. The main instruments in all these projects have been drought-resistant trees, mainly of eucalyptus and acacia species, which have been planted to stabilise dunes, to ameliorate the climate, to raise the water-table and to provide nurse conditions for other crops.

One of the most encouraging of these projects has been established by a New Zealand woman, Miss Wendy Campbell-Purdie, at Bou Saada in Algeria. Following large-scale tree-planting, wild grasses



A sand fixation project in the Tengri desert

and shrubs appeared in the desert by natural regeneration, and it has since been possible to grow successful crops of citrus fruits, olives, figs, pomegranates, tomatoes, potatoes, peas, beans, onions and barley.

For tree-planting under conditions of minimum water availability, a system known as *potet masqué* has recently been developed in Algeria. A mulch of vegetation is placed round the seedling and the topsoil is covered with stones. The vegetation acts as a sponge for the retention of water while the stones minimise evaporation.

China is another country which has gained much valuable experience in desert reclamation over the last twenty-three years. Since the establishment of the Maoist régime nearly two million acres of desert have been reclaimed, while the advance of the Mongolian deserts has been halted by the planting of extensive shelter-belts of trees. One of these, in North-East China, is 1,000 kilometres long and 500 kilometres wide. In order to make possible the planting of trees in shifting sands, "gridirons" of topsoil, much of it carried over long distances on the backs of human beings, are created to fix the sand.

Some of China's desert reclamation schemes have involved epics of human courage, endurance and pertinacity. The scene of one of these was the Maowusu Desert in Inner Mongolia. Under the leadership of a woman named Bolortoi, the members of a commune called Usantsao, succeeded, after many failures, in establishing windbreaks of a bush called the sand sagebrush on shifting sand-dunes, and now some twelve thousand acres of pasture and trees support a flourishing livestock industry. Among the trees are apples and carobs, the latter providing fodder for animals.

During the last war a leading American conservationist, Walter Clay Lowdermilk, proposed the establishment of a Jordan Valley scheme on Tennessee Valley Authority lines, with a view to expanding the economic capacity of both Palestine and Transjordan, as the kingdom of Jordan was then known, and thus lessening Jewish-Arab tensions which were already rife under the British Mandate. It was hoped that, by co-operating in an ambitious scheme which would bring benefits to themselves, Jews and Arabs would discover a common purpose which would enable them to transcend their hostility.

Is it inconceivable that a similar scheme—starting perhaps with a small-scale joint research project and involving the pooling of Israeli and Arab expertise in the overcoming of desert problems—might create a new spirit in the Middle East and lead to a period of lasting peace, from which the whole world would benefit? In the words of William James, the great American psychologist, the physical and emotional challenges which such a scheme would arouse would constitute a "moral equivalent of war".

Information for Survival Digest

Editor: Dr. Kenneth E. Barlow

TIMBER

Now Ghana

The chiefs in Ghana are urging the Government to end the export of oak altogether. They suggest that the Government should "force timber merchants to re-plant trees in place of every timber tree felled". They stress that if the Government fails to act this will result in a shortage of timber in the country in the near future.

The chiefs, petitioning the Government, warn that because of the rush to export processed wood "a considerable quantity of logs have been left by the road between Kumasi and the port of Takoradi". They urge that the logs are carried to Takoradi before they rot.

Cameron Duodo, *Financial Times*, 5.10.72, p. 29.
Ref: 000,549

Waste paper

1.2 million tons of newsprint are used in California every year. Canada's largest forest products concern (MacMillan Bloedel) is studying the feasibility of building a \$30 million plant in San Francisco Bay area to produce newsprint from used newspapers. It estimates the minimum economic size of plant would have a capacity of 100,000 tons of newsprint every year.

The Guardian, 2.10.73, p.19.
Ref: 000,555

SOCIAL ORGANISATION

Iran

Despite income from oil, inflation in Iran is rampant—between 13 and 18 per cent per annum. Wages have risen in some cases dramatically and so have expectations but the purchasing power of the rial has dropped.

Due to loss of confidence in money, the price of land has increased, often trebling over the past year. Food prices have also gone up.

Meanwhile world pressures for raw materials is prying developing countries out of their chances of entering the league of major industrialised nations.

David Housego, *Financial Times*, 5.10.73, p.8.
Ref: 000,550

China

When the communists took over China in 1949 they inherited a country with a few heavy concentrations of industry in the East and North East, a rich agricultural belt in the centre and South and very few economic assets of any kind in the West or North West.

The Central Government has been engaged since 1949 in a massive transfer of manpower and resources to the economic fringe areas from the older industrial centres, particularly the Great North West, the area stretching from Sian in Shensi province and up towards the Soviet and Mongolian frontiers. Sian (a former Imperial capital of China) has few vehicles and virtually no passenger cars. The standard of living is unmistakably more primitive than in many places further East. Under a municipal regulation every healthy adult citizen is obliged to deliver about a ton of his own 'night soil' or human manure to the countryside every year—and because there are no other forms of transport, he must make the delivery either by bicycle or with a primitive handcart. Night soil is a valuable commodity for Sian because of the shortage of most kinds of fertiliser.

Loyang lies some eight hours' train journey to the East of Sian. Its domestic heating—like the fertilisers for Sian's cotton crop—depends on the husbanding of resources that would go to waste in most other countries. It is based on coal bricks produced by a co-operative from dust gathered in the railway fuel depot.

Both Loyang and Sian are raw specimens of the new China, totally lacking in charm. It is hard to believe that many of the factory workers, shopkeepers and bureaucrats who have helped to build the economies of the two cities would have listened to Chairman Mao's call to "develop the Great North West" if they had had the

option to ignore it. But now that they are there, there is at least a sense of achievement in the air.

Charles Smith, *Financial Times*, 1.8.73.
Ref: 000,493

FOOD, AGRICULTURE & FISHERIES

The Economics of Waste

The National Farmers' Union knows that an average of just under three and a half million tons of straw is burnt in the fields every year. By its own calculations this amount of straw would cover the motorway between London and Shrewsbury 12 feet deep.

With corn acreage on the increase and labour becoming more scarce and expensive it does not pay the farmer to bale and sell his straw.

Gillian Linscott, *The Guardian*,
15.9.73, p.11.
Ref: 000,536

Mediterranean

The catch of fish in the Mediterranean basin including the Black Sea amounts to about 1 million metric tons, less than 2 per cent of world marine fish production.

On April 16 1973 Malta opened application for offshore oil in 16 new blocks on the continental shelf. It remains to be seen how these two uses of the sea (fish and oil exploration) eventually interact; as in the Caribbean the areas of likely oil wealth are about the same as the areas of fish concentration.

International Ocean
Report IV, May 1973.
Ref: 000,502

INDUSTRY

English chemical prices

Prices for some chemicals in Europe and elsewhere are running at 40 per cent above controlled British levels.

With these prices, foreign producers can afford to pay more for their raw materials. These "commodity chemicals" could, accordingly, be diverted from the British market. "This could seriously curtail UK industrial expansion, and could even cause a reduction

TOWARDS SURVIVAL

in present levels of working", say the Chemical Industries Association.

Peter Rodgers, *The Guardian*,
8.9.73, p. 12.
Ref: 000,537

ENERGY

Soviet oil

At the moment Siberia provides only a little over 10 per cent of the USSR's energy needs. But as the oil fields in Azerbaijan and other energy sources in the Urals run down, Siberia will have to do more.

According to estimates made by a Hungarian economist in the journal *Valóság*, by 1980 Comecon will have to import between 19 and 21 per cent of its anticipated consumption of oil and perhaps 18 per cent of its natural gas. The Soviet Union is not expected to increase production to keep as large a percentage of this market as, at present, it enjoys.

Jonathan Steele, *The Guardian*,
2.7.73, p.3.
Ref: 000,539

Geothermal energy

There are four kinds of geothermal field. Dry steam heat such as at Landarello in Italy can be fed direct into the turbines of a power station. These are comparatively rare. Hot water fields are the predominant type, and account for most of those discovered in developing countries by UN teams. The first hot water field to be developed was at Waikakei in New Zealand, and energy is extracted both by turning the water into steam by reducing the pressure, as in a dry steam field, and by direct use of the hot water left, which can be transported economically up to 50 km.

Then there are low temperature fields in basins of sedimentary rock, containing water at between 40 and 100°C, which is used for heating crops in glass houses, fish farming and other agricultural uses. In most industrial countries, one third of total energy is used for heating. Finally, there is the "geothermal pressure zone" which may turn out to be the biggest source. These are high pressure zones found by petroleum drilling deep in sedimentary basins. Instead of exploiting the direct

TOWARDS SURVIVAL

heat of the water, it should be possible to use the enormous mechanical force produced by the huge pressure of the water for power generation.

Dr. Barnea has said that geothermal pressure zones exist under many European countries including offshore areas—and practically everywhere oil companies have drilled. Unfortunately, there is a drawback: much of the information is kept secret by the oil companies.

Peter Rodgers, *The Guardian*,
21.9.73, p.24.
Ref: 000,556

Now Japan

In the 12 months ended March 31, 1972, the import content of Japan's energy supply rose above 80 per cent. By contrast, Britain's import dependence in the same period was 40 to 50 per cent and that of the US less than 10 per cent.

Energy consumption per square mile in Japan is eight times that in the US and double that in Britain.

In 1960 Japan depended on petroleum for less than 40 per cent of primary energy supplies. Oil consumption was 84 million kilolitres. In the next 11 years, consumption increased to 300 million kilolitres. On average, world oil consumption rose at an annual rate of 5 per cent. Japan's rose 12 per cent.

Hydroelectric power supplied 16 per cent of Japan's energy needs in 1960. The proportion fell to 6 per cent in 1970.

At present there are five nuclear plants in Japan with a generating capacity of 1.8 million KW—3 per cent of the electrical power consumption. The suggested target is a seemingly impossible 60 million KW by 1985. This would provide some 25 per cent of the then needed generating capacity, equivalent to about 8 per cent of the primary energy—that is, if some way is found of relieving the fears of local residents.

Peter Duminy, *Financial Times*,
9.10.73, p.32.
Ref: 000,548

Oil and the Arab-Israel War

An assessment of the effect of the war on oil supplies was made in October. There are two major pipelines

crossing Syrian territory. One brings about $\frac{1}{3}$ million barrels a day from Saudi Arabia. The other brings over a million barrels a day from Northern Iraq. The former connects with the Lebanese port of Sidon; the latter with the Syrian port of Baniyas and the Lebanese port of Tripoli. Israeli bombing had then put most of Baniyas and a refinery at Homs out of action. Syria's declaration of the whole area which includes these oil ports as a war zone prejudiced insurance and therefore transport.

The Southern Mediterranean countries, Italy, Greece, Turkey and, to some extent, France, are the main recipients of oil from these ports.

The loss of about $1\frac{1}{2}$ million barrels of crude oil per day is equivalent to about 10 per cent of the total West European oil consumption. "But it is not the immediate difficulty of taking oil from the Eastern Mediterranean which is causing the consumer Governments of Europe such concern. Rather, it is the problem of meeting any further restrictions on supply which might come on top of it. The elimination of the Syrian and Lebanese terminals has effectively wiped away for the present what little margin the consumer and oil industry had, in meeting supplies. Anything else that occurs could be critical".

Adrian Hamilton, *Financial Times*,
13.10.73, p.16.
Ref: 000,544

Cost of Energy

Lord Nelson, deputy chairman of the GEC warns that a modest nuclear programme of 2,500MW a year calls for an investment of £250 million a year "before interest during construction and without escalation".

Mr. Art Rolander, the man designated to lead the new Gulf-Shell nuclear venture asserts that the application of nuclear heat to new sources of oil recovery from shale or tar sands, or liquefaction and gasification of coal, could absorb an investment of over £8,000 million by 1985. "Even this investment would meet only 6 to 8 per cent of present US demands for oil and natural gas".

An estimate from Stone & Webster, a leading US firm of architect-engineers in the nuclear business, anticipated a

US investment of \$127,500 million (about £50,000 million) by 1990 in 425,000MW of nuclear power. This figure took no account of inflation; it was based on a 1973 price of \$300 per MW although the experience of recent years has shown that costs by 1990 could be five times as great.

Similarly on fuel. The nuclear fuel industry will need to find £7,500 million in the US by 1990. Over the same period the US electrical utilities would have to find about £24,000 million to pay their fuel supplies.

David Fishlock, *Financial Times*, 11.10.73, p.22.
Ref: 000,545

A different energy shortage

Last winter California freakishly received most of the heavy rains that normally soak Oregon and Washington. Last year's snowpack in the Northwest was only 70 per cent of the normal—leaving the reservoirs in the area unfilled.

In the Pacific North West States the hydroelectric system supplies more than 90 per cent of the area's electric power. By September 1, the region faced an expected deficiency of 15,000 million KW hours over the next 20 months.

The West coast of the US faces a series of partial black-outs reminiscent of its wartime experience.

Art Garcia, *Financial Times*, 10.10.73, p.5.
Ref: 000,546

WILDLIFE

Trade in skins

National attitudes to wild life preservation were shown at a IUCN Conference in March. Countries with wildlife pressed for restriction in trade in skins but countries importing skins, like Japan and Holland, pressed for looser regulations. These, however, are often dodged. In February New York furrier Veseley-Forte Inc. pleaded guilty, along with 32 other defendants, to a 50 count indictment of dealing in animal skins, bought from poachers or middlemen and valued at about £2

TOWARDS SURVIVAL

million. A crate with a waybill describing the contents as leather, broke, showing spotted cat skins. Investigations revealed the extent of the trade.

A new convention has been signed covering nearly 700 species but ratification may take some years.

"Evidence of widespread corruption throughout the skin business, and especially in South America, is such that one can only welcome the new convention as at least a starting point in controlling this dubious trade".

Nigel Sitwell, *World Wildlife News*, Summer 1973.
Ref: 000,490

The Red Books

The *Red Data Book of Endangered Mammals* is published by the International Union for Conservation of Nature and Natural Resources. Extinction of 132 wild mammals is threatened. They are catalogued in the new edition.

World Wildlife News, Summer 1973, p.16.

Whales

In 1938 whales contributed 10 per cent of the marine harvest. In 1952 they still contributed 10 per cent by weight although by then the fish catch had increased by a quarter. The annual whale catch stayed over 2.3 million tons until the steady decline started in 1962. If the stocks were now allowed to build up and were properly managed by a competent international authority, they could in future yield about 1.9 million tons annually on a sustainable basis. It is important to realise too, that this would not be incompatible with the aims of those groups concerned with the survival and conservation of whales; on the contrary there would be far more whales of all species always left in the sea than there are now.

International Ocean Inst. *Report IV*, May 1973.
Ref: 000,501

TOWARDS SURVIVAL

Poetry

PARTY POLITICAL BROADCAST ON BEHALF OF ANY CURRENTLY RULING PARTY

I am authorised by our leader to tell you that all is well.

Since we took office many things have improved, and our position in relation to that of many other countries is improving; so if you hear talk that anything is wrong do not worry about it.

The old ones have been awarded an increase (which they will begin to receive eventually) so if you hear anything disturbing, do not be disturbed.

Price increases have been kept to a minimum (except for those which are, unfortunately, outside our control) and production could be doubled if raw materials were not becoming scarcer. So don't worry about it.

And if you feel that today is not, somehow, as bright as yesterday (which was less pleasant than the day before yesterday) and thus fear for tomorrow—do not, for one moment, worry about it.

Finally, if you have any doubts about the viability of our life-style, you have been listening to the wrong people. There have always been such people: ignore them, and don't worry about it.

Have faith in the common man: that is, the common man employed by your government and your monolithic corporations, who all have at heart your constant well-being.

And don't worry about it.

Eric Millward

NATIONAL RAIN

Man has decided to regulate rain, so Cumulo-Cirro-Stratus Cloud descends at night leaving day dried and the boot trade bankrupt. Children build ice-men at dawn before thaw. Thunder and lightning saturate sleep.

In time, squall will no longer compete with shower, nor mountain with valley. Soft warm water will fall at consistent intervals in controlled quantities—discarding the old laws of nature. What a contretemps! Particularly when Cumulus, Cirrus or Stratus is careless. Then month may drizzle on to month, and pundits say, "This company ought to be limited".

Jenny Johnson

Doctors & The British Malady of Overpopulation

Dr. John A. Loraine, Chairman, Doctors and Overpopulation Group

The United Kingdom is grossly overpopulated. In terms of its overall population density and excluding small islands and city states, it ranks ninth in the world league of overcrowded nations. But the situation of England and Wales is even worse, this area's population density (323 persons per square kilometre) being exceeded only by Bangladesh and Taiwan.

Until very recently the interest of the medical profession in population problems was miniscule. Doctors remained steadfast in their assumption that patient care was their transcendent duty; social problems affecting the community as a whole were not a prime interest of medicine and were better left to other disciplines.

In late 1971 some colleagues and I cried "enough is enough". We put forward the view that doctors must become increasingly involved in social issues and that, in particular, they must become concerned with and well informed about overpopulation. Fifty-five of us, representing a wide spectrum of the profession, clubbed together and sent a joint letter to the *Lancet* and the *British Medical Journal*. The letter was published on January 8th, 1972 under the title of **Doctors and Overpopulation**.

It was immediately obvious that we had struck a highly responsive chord throughout the profession. A massive correspondence ensued, and the end result was the formation by late January 1972 of an organisation which came to be known as the **Doctors and Overpopulation Group**. It now has over 2,000 members; it straddles the profession and it is still growing. It played a leading role in pressuring the Government to provide free contraception within the framework of the National Health Service. On Britain's first ever Population Day (May 12th, 1973) doctors were prominent in their support, and over 3,000 medical and paramedical staff signed the **Call for Action** associated with Population Day.

Our original letter contained five points and these still constitute our credo. The points are as follows:-

Firstly—and this is of vital importance—the Government must declare publicly and unequivocally that a population problem exists in these islands and that they propose to take appropriate remedial action to remedy the situation.

Secondly—we wish to see a large extension of family planning services in Britain, and we take the view that such services should be provided completely free within the framework of the National Health Service. We recognise that in this area the Government has moved significantly in our direction, but we would, in addition, favour the abolition of prescription charges for contraceptives.

Thirdly—we wish to ensure that the abortion law in Britain remains liberal. We are distressed by the regional differences which still exist as regards the ease with which abortions can be carried out, and we desire to see the National Health Service provide greatly improved facilities for the termination of pregnancy. We welcome the fact that additional training is now being provided for doctors in the technique of vasectomy, and we gave our unqualified support to the establishment of the organisation known as the Vasectomy Advancement Society of Great Britain.

Fourthly—we have the rights of women much in mind and we are sympathetic to those of that sex who wish to seek fulfilment in life styles other than those associated with marriage and childbearing. We believe in female emancipation because of the moral imperative which lies behind such legislation, but we also recognise that such a policy might well have highly beneficial effects in an antinatalist direction.

Finally—we remain devotees of population education and we wish to see the message of the world's predicament carried into every school, college and university in Britain. We believe that doctors with their specialised knowledge and strong social motivation are in a peculiarly favourable position to ensure that such a policy is implemented.

As far as I know our **Doctors and Overpopulation Group** is a unique organisation in the planet of 1973. But our very uniqueness carries with it a heavy responsibility for it means that we must act as the pacesetters for the medical profession in all other countries. We must not shirk this responsibility. Instead we must accept it and demonstrate to future generations of doctors that we did not fail the planet at this its time of greatest need.

Highland Front

Roy Bridger

Fishing for fun

Sea anglers of Great Britain, catch your dream fish—and qualify for a dream prize awarded by the nightmare Highlands and Islands Development Board. The contest is open to all anglers (i.e. all members of the public) permanently resident outside the Highlands and Islands, which means more previous transport energy frittered away as they move dashing north to Highland coasts. The Board "explain" that the content has been devised "to encourage sea angling in the Highlands and Islands", but these are meaningless words. Is angling languishing? Or perhaps flourishing onshore but

nervous of entering territorial waters other than Iceland's? Is this something to do with protein and vitamin D quotas?

And what does the "catch" think about it? "A monster skate weighing 153 lb. was caught off the Summer Isles by Police Chief Inspector Ian Cameron, Inverness, this week. It was the largest skate caught off Ullapool this year. The fish was 6 ft 3 in long and 5 ft across the wings. It was landed with the help of a winch one hour after being hooked".—news items in the *Ross-shire Journal*. Another "sporting" fight, evidently. The skate is a stop-go-catch, holding back hard, then letting go only to hold back again in its new position. It makes very undreamlike eating, the sort of catch that gets left around the pier for the poor of the parish to bear away, or the cleansing department to remove to its noxious dump for "waste" matter.

Waste, waste, waste. Don't worry about Atilla the Hun. Forget about Genghis Khan. The most dangerous man in the world is coming up the street right now. He has got the car out to drive round to the local for a few drinks and a chat about nothing much. Maybe he's thinking of entering for this sea angling contest next year that this chap in the same town won this year. "We will be presenting the trophy to the winner in his or her home town during the close season, when the angler dreams of fishing days ahead".—HIDB spokesman. And while one spokesman happily enthuses on the latest way of frittering the oil away, another will be solemnly insisting that we *must* open up new sources of it.

Correspondence

Herman Kahn

Your observations on the Controversy programme with Herman Kahn (October editorial) seem to me to miss two important points. He began by saying that *Limits to Growth* was unsound because it selected a small fraction of world variables, then constructed a computer model by putting these together and demonstrated that the world was heading for collapse. Kahn criticised the simplicity of the model, saying that collapse could not be proved because the complexity of the real world was not reflected in the model. At question time, however, he defended his technological optimism by isolating each factor on which he was challenged and 'proving' it could

work—but he never proved that the whole system would work. If collapse cannot be proved in a simple model surely the even more simplistic treatment of each bit of technology separately cannot prove that the world system will work.

The more important point, however, was when Herman Kahn described the possibility at some future date of a world with a lower population and percapita consumption being a better, happier and more satisfying place to live and added: "That's a new thought to me". It seems incredible that this had not occurred to him before, but it will be interesting to see if he is prepared to think through the implications of his 'new thought' then reveal his further conclusions

The following week Ned Franklin defended the nuclear programme but was very emphatic that the 'go' or 'no go' decision on building large numbers of nuclear reactors should be vested in the public. I tried to ask a question in the studio but Sir George Porter did not call me; if he had done so my question would have been: "Since the public have not been given the opportunity to make the decision about the nuclear programme, would you agree that until they have, further work on nuclear energy should be confined to research, and no new nuclear reactors should be built?" Perhaps through your columns Ned Franklin can be persuaded to answer?

COLIN HUTCHINSON

Kingswood,
Beatrice Road,
Oxford.

Chairman, The Conservation Society.

Cycling

I have read your recent article on cycling with interest (*Towards Survival* Number 16). 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 wanted 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 of protection for bicycles?

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

Unearned Income

Just as one cannot fault the logic behind the two principles of conservation (*Towards Survival* Number 14), so one is bound to agree with Margaret Laws Smith's case against unearned incomes (*Towards Survival* Number 16). In both cases, however, I venture to suggest that they will run into difficulties when they are tested in the real world, unless they undergo some modifications.

As to unearned income, to single this one out would leave some awkward problems of definition, and some huge loopholes. We are dealing with a relatively astute section of the community. I suggest that a sufficiently close approximation to the intended effect would be produced by a National Income (i.e. a truly re-distributive tax credit scheme) with a sharply progressive tax structure with an upper 100 per cent "cut off" point.

Re-distribution is going to be a difficult exercise at best, but a "blanket" solution is the only way I can visualise which will avoid a whole host of pitched battles and unfair evasions which, in turn, will produce a vicious circle of lowered morale and refusal to co-operate.

CLIVE R. LORD
44 Upper Batley Low Lane,
Batley
Yorks. WF17 0AP.

"Japanese can't have the oil too!"

Graffito on London Underground:

"Mitsubishi Oil Company announced this week the conclusion of an agreement with Getty Oil Company to import between 3 and 4 million kilolitres (2.4 to 3 million tonnes) a year of North Sea oil from 1975 onwards".

Financial Times, 31 October

Reviews

Books

Oil and the Future of Personal Mobility by Nicholas Pole (Eco Publications, 6 Cavendish Avenue, Cambridge, 50p including postage).

In this book the general energy situation and the transport problems facing this country are presented with admirable economy. The background information has been thoroughly researched and described with the assistance of well-designed graphs. The writer, director of Cambridge University Conservation Society Transportation Research Project, amply demonstrates the need for a reappraisal of transport policy. Probably the most interesting two chapters are those which discuss electric cars and their significant overall margin of efficiency over the present i-c ones, and the use of tracked vehicles for inter-city and urban transport, plus a most intriguing description of the Gravity Vacuum Tube—a possible future mode of transportation of little environmental impact and of apparent high efficiency. For those leaders of the British car industry who affect a studied puzzlement about talk of a petroleum crisis, Nicholas Pole instances the imaginative efforts of other European car manufacturers such as Fiat, Volvo, Daimler-Benz and Bosch who are rapidly diversifying into other motive systems. This is an excellent presentation; it will be of great value to all students of transportation. L.B.

The Logarithmic Century by Ralph E. Lapp (\$7.95, Prentice-Hall, Inc., N.J.)

The advanced countries, consuming the bulk of the world's resources in order to super-feed a minority of the world's population, are showing how we could be living in "the only logarithmic century to spin itself out upon a defenceless planet". These words end a book which presents a readable description of almost all aspects of consumer growth together with meaty data from many sources in graphical form. A physicist, the writer does not dwell much on the ecological impacts of technology and not at all on the parameters of food production (which he admits), but otherwise this is a wide ranging and balanced account. While

CAMBRIDGE UNIVERSITY
CONSERVATION SOCIETY

OIL and the FUTURE of PERSONAL MOBILITY

by Nicholas Pole

reviewed in this issue
of *Towards Survival*

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he is not an extreme doomsayer he is objective enough to assert that our obsession with growth may strangle civilisation as we know it. But yet we cannot simply cry "Halt": an orderly plan is called for. This is useful background briefing for the stable-stater who wishes to keep well informed.

K.H.

World Food Resources by George Borgstrom (Intertext Books, £1.75p)

This is the latest book by one of the world's foremost authorities on food. It is a comprehensive and readable text and to be recommended. The book is divided into three sections: the first reviews which commodities constitute the bases for our foods and surveys what farmlands, oceans and freshwaters deliver to our larders; the second describes how these commodities are processed into food and animal feedingstuffs; and the third discusses the critical relationship between food and population with particular reference to balanced proteins, together with the key role that food plays in the current ecological crisis. There are also 18 pages of valuable supplementary

data. Georg Borgstrom is a man filled with the need to change the frivolous and irresponsible priorities of almost all present governments. He has been sounding the tocsin for many years. In this country we are increasingly beginning to realise that food-getting is a costly and precarious business. What Borgstrom says about the less developed world will soon start to apply to us too. Our crisis is only just round the corner.

K.H.

Population Growth in Oxfordshire (Survey by Oxford Branch of The Conservation Society, 25p post paid).

This is a most important study for it illustrates with reference to one area of the country how a continuing increase in population is inexorably eroding the quality of life. Thus over-population in Oxfordshire is exacerbating the housing shortage. It is making increasing demands on precious agricultural land, and it is placing the Green Belt in jeopardy. Social services are failing to keep pace with population growth and overall educational standards are tending to fall. Amenities is being gradually

POPULATION GROWTH IN OXFORDSHIRE



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

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Abingdon, Berks.

A shorter version at 5p is also available.

destroyed and recreational facilities are now inadequate. The whole country has become the helot of the motor car, and between 1961 and 1971 the number of privately owned vehicles more than doubled. During the same period the efficiency of public transport services declined, especially in the rural areas. The lesson from Oxfordshire is quite clear. The population of the area must first be stabilised and then reduced. Only in this way will life again become tolerable for those inhabiting this part of our country.

J.A.I.

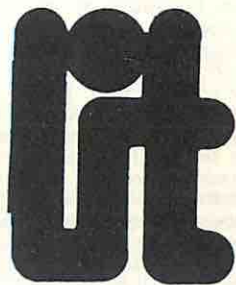
Did We Save the Earth at Stockholm?: the people and politics in the Conference on the Human Environment, by Peter Stone (Earth Island, £1.50/£2.75).

"If you ring them and say you have a story about the UN you're lucky if they don't hang up there and then!" The professional communications man hired as PR aide to whip up planetary eco-fervour (on a budget of \$15,000!) Peter Stone should know. No ideas man, but a smart journalist; he's the fellow who wrote *Japan Surges Ahead*, known to knowing colleagues as "My five days in Japan"; so one reads cautiously. Not wearily though, for it is briskly written. He is good on the hard graft of the two years' preparation for UNCHE; and better with his little asides, like the flower-powered Azelean delegation, or the effort to have Paul McCartney write *Only One Earth*. Regrettably thin on the dizzying fortnight itself, the Conference and its voluminous fringe activities are mostly confined to a single impressionistic

TOWARDS SURVIVAL

chapter, usefully padded for some readers with a 50-page appendix of all recommendations agreed. Largely about the UN, this is a book worth reading. The title question, of course, remains unanswered.

P.B.D.



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Announcements

Announcements are free to subscribers at the editor's discretion.

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.

RAILWAY INVIGORATION SOCIETY. For the retention and modernisation of railway services. Progress Report and particulars from the Gen. Sec., Mr. J. M. Stanley, 12 Westcombe Park Road, London SE3 7RB.

RAILWAY DEVELOPMENT ASSOCIATION. A voluntary Association to foster rail transport. Send for leaflet and particulars to the Hon. Sec., Mr. A. W. T. Daniel, 3 Hall Way, Purley, Surrey.

WWOOF puts people who want to learn in touch with those who know and practice organic farming. Working Weekends On Organic Farms, 12 Sussex Place, St. Paul's, Bristol BS2 9QW.

THE ECONOMICS OF NATURAL RESOURCE DEPLETION. One day conference, 16 January 1974, sponsored by the Environment Economics Study Group and the Institution of Environmental Sciences. Five papers on energy resources, aspects of global modelling, fisheries and economic approaches to general resource depletion. To be held at the Royal Institution, London. Conference fee £7 to non-members of the EESG and IES. Application forms from D. W. Pearce, Conference Organiser, Department of Economics, University of Southampton, SO9 5NH.

SOCIALIST ENVIRONMENT ASSOCIATION. Are you worried that the message isn't getting across to the labour movement? If you think that such an organisation is needed write to Steve Cohen, 120 Buckingham Street, Newcastle-upon-Tyne, NE4 5QR.

ENVIRONMENTAL STUDIES. Summer Term 1974. One-term course for serving teachers of the 8 to 13 age range in Environmental Studies. The course will consider environmental problems and the contribution that education can make to their solution. The main emphasis will be on teaching method. Further details from John Burton, Alsager College of Education, Alsager, Cheshire.

HYPERMARKET IN GREEN BELT. Within the near future the Warwickshire Branch of the Conservation Society will be objecting to proposals for a hypermarket in the Green Belt between Coventry and Birmingham. I should like to hear from anyone with relevant experience or knowledge on this subject.—Chris Holland, 270 Holyhead Road, Coventry.

EDUCATIONAL FACT SHEETS. "Our Environment—Our choice" (5p per set of 7 sheets, or 75p for 25 complete sets.) Also the revised version of *Guide to Resources in Environmental Education* is available from Peter Berry at 10p, 246 London Road, Earley, Reading RG6 1AJ.

ENVIRONMENTAL PROJECTS. A series of seven project outlines for teachers in local schools. They comprise: A Project based on the Classroom, A local Industry, Food and Farming, Communities in their Environment, Transport, Man as Consumer, What Can I Do? A Guide to Environmental Action. Price: 50p per set or 10p per project. They all contain bibliographies, films, lists of addresses, lines of study and suggested activities. Mostly for secondary but could be adapted for younger schoolchildren. From Mrs. Imogen Bright, 74 Lincoln Park, Amersham, Bucks.