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The Remaining Commons: a challenge to equity, efficiency and ecological responsibility

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SURPRISING as it may seem, the greater part of the Earth's surface, if we count the oceans as well as the land, has not yet passed into the ownership of specific persons, companies, institutions or governments. Much of it has not even been claimed as national territory by governments. This vast expanse comprises the Remaining Commons of the Earth. If we look outwards, Outer Space is also part of the Remaining Commons. Some areas of the Remaining Commons may be taken into specific ownership in the relatively near future. Conventional economists argue that this will be beneficial, since natural resources which belong to no-one are likely to be exploited to destruction.

It may be desirable that property rights should be introduced into the Remaining Commons, but the structure of these property rights is extremely important. The wrong structure will impose restrictions on the freedom of individuals, provoke conflict within nations and between nations, and cause the destruction of resources. Now is the time to think about the correct structure for these property rights.

The stakes are high. As we look around the Earth we find that the rivers, lakes and seas are polluted and filthy, the dry land is despoiled and eroded, the atmosphere is poisoned with noxious substances, ranging from toxic fumes to unseen radiation, which will be lethal, not just for a short while, but for millions of years. Forests are being

destroyed, and deserts are expanding. Animal and plant species are being destroyed at record rates; the African elephant is one of the best-known of all animal species, yet it may be extinct in twenty or thirty years from now. The extinction of plant species is less dramatic, but no less significant for human well-being; wild plants can provide new crops, new pesticides, or new drugs. The destruction of the environment has not even allowed the majority of human beings to live in comfort.

The conventional argument is that private property rights are essential to the preservation of the environment, but anyone who looks around England will conclude that, in a country where all land is owned by someone, private property rights have not provided adequate protection for the environment. England has less tree cover than any European country except Eire, soil erosion is a serious problem in the area of East Anglia, many rivers and streams are polluted, and derelict land is wide-spread. Private ownership of land is the rule also in the USA; yet there is soil erosion, derelict land, pollution of streams, lakes and rivers, and destruction of forests. The existence of conventional property rights is not a sufficient condition for the preservation of the environment; it may not be a necessary condition either.

The Remaining Commons present a problem; can property rights be introduced, without imposing injustice or provoking conflict? These commons do, or could, offer a livelihood to people who have not managed to acquire ownership of other natural resources. The freedom of these people would be curtailed if they lost out in the allocation of property rights in the Remaining Commons. In the past, the people who already controlled substantial amounts of private property were the ones who grabbed the largest share of the commons of that era. Yet the Remaining Commons simultaneously present an opportunity; they are a cornucopia of natural resources, which, if properly managed, could offer a decent living to hundreds of millions of people. This is an opportunity which could be seized without loss to any one, since no-one can claim property rights in these commons. A sound system of property rights would allow the equitable, efficient, ecologically-sound utilisation of the Remaining Commons. It would turn an apparent problem into the opportunity of the next millennium.

Finding a solution to the problem of the Remaining Commons requires a systematic approach. There are six questions to consider. Where are these commons? What is the problem? Why is there a problem? Who wants a solution? When is the solution needed? How can the problem be solved?

The first five questions lead on to possible answers to the last question, which is the most important one. The solution is a system of property rights within which utilisation of the Remaining Commons can take place in an efficient, equitable, ecologically sound way.

The Location of the Remaining Commons

The Remaining Commons are of two kinds. First, there are the 'Last Commons' which comprises those regions of the Earth which have not yet been claimed by any nation-state. There are the oceans and the ocean sea-beds beyond territorial limits. There is the atmosphere, except where this has been appropriated as national territory, as in the case of air space over a country. There is Antarctica. Outer Space is also part of the Last Commons. The Last Commons are a reminder of the time when all the Earth was the common possession of mankind, and none of it had passed into the exclusive control of any tribe or nation.

Second, there are parts of the Earth's surface which have been claimed as national territory, but have not been parcelled out as the exclusive private property of any individual, company, institution, or government body. Lands claimed by a particular nation, but not allotted as private property, will be described here as 'Remnant Commons'. These are the remnants left over from the time when the territory occupied by a tribe or nation was regarded as the common property of all its people. These areas are substantial. The Remnant Commons, world-wide, include; jungles and forests; deserts; mountains; rivers and estuaries; sea-shores; the sea-bed adjacent to land; air space over countries.

The behaviour of nation-states with respect to the sea-beds shows what is likely to happen to the Last Commons unless active steps are taken to prevent it. The former three-mile territorial limits were determined by the effective range of shore-mounted cannon. Modern

weaponry enables a state to control the sea much further out than this, so that it is realistic for a state to claim territorial rights up to 200 miles from shore. Most states now do this, and thereby substantially increase the natural resources they control. They have turned what was formerly part of the Last Commons into Remnant Commons. The technical developments which made it possible to drill for oil under deep water, and even in stormy seas, led to the allocation of the Continental Shelf to specific nation-states. This allocation was based upon existing national boundaries; a straight line was taken out from each boundary. A trough in the sea bed is usually regarded as the end of a nation's section of the continental shelf, and thus as the boundary of its effective territory. Difficult cases may be settled by negotiation, or by reference to international law courts.

As to Antarctica, it seems that the nations which at present have claims on it, are trying to turn it into Remnant Commons. Argentina arranged for the wife of an Argentine naval officer to be flown to their section of Antarctica, so that she could give birth there. This was to strengthen its claim upon Antarctica, although it is unlikely that it will establish a long-term settlement there, seeing that it has failed to settle Patagonia to any significant extent, even though the climate of Patagonia is relatively mild. In August, 1990, Australia announced that it would not allow any exploitation of minerals in its section of Antarctica; while this is good for conservation, yet it is also a reiteration of territorial claims.¹ Australia is claiming the right to decide how one section of Antarctica should be used.

As far as Outer Space is concerned, the allocation of this into national sectors is, at present, in the realm of science fiction rather than science fact.

Reverting to dry land, even in the densely populated UK, there are still significant areas of commons. There are laws about the use of these commons, which may offer some ideas about how to deal with the Last Commons and with the Remnant Commons.

In the UK, there are now no commons in Scotland; in the Lowlands, the remaining commons were all allocated to specific owners in the 17th Century. The Celtic tradition of common ownership of land by a clan persisted up to the 18th century in the Scottish Highlands, but the laws prevailing in the Lowlands were

then imposed there also. In Scotland, the public usually has no legal right of access to privately-owned land, but there may be free access in practice. In England and Wales significant areas of commons remain. Some of them are managed like public parks, and there is free access to them, subject to any regulations which apply. In rural areas, there are commons which are used for agriculture or grazing, as common-land traditionally was used. In England and Wales, commons are owned by someone, even though this may be the local council or central government, or some government body — e.g., the Ministry of Defence. A large area of common-land close to central London can be found at Blackheath. This has been open land for several centuries, yet, as recently as the late 1980s, the persons who owned this land announced that they were investigating the possibility of taking it back into their exclusive private ownership.

English law provides, in detail, for the use of common land. This is a survival from the feudal period, but it should not be despised on that account; all ownership of land in England is ultimately based upon the feudal system of land-holding. Throughout the centuries, a person's right to the land he claimed was dependent upon the ownership of the person he bought it from, or inherited it from, and that person's right was dependent upon the right of the person that he had acquired it from, in an unbroken chain of proven ownership. There are several distinct common rights, such as rights of pasturage, of fishing, of taking brushwood, peat or gravel. There may be restrictions on the type of livestock which can be pastured; it is not permitted to graze a bull in a field through which a footpath runs. Specific common rights are not open to anyone; they are usually linked to the ownership of specific pieces of land in the vicinity. Public footpaths and bridle-paths are open to all.

The system of common land management which operates in England and Wales is based on the English Common Law. Where Roman Law applies, as in continental Europe, there is no common land. However, the general public have access to most of the open land. The British visitor to Greece, or Spain, will find that she or he can walk more freely over land than is the case in Britain. In Italy, shooting is a popular sport, because shooters have access to all open land; the land-owner has no exclusive right to game on his land. This reflects Roman Law, which does not recognise any private property

rights in wild animals, birds or fish; these belong not to the land-owner, but to whoever manages to catch or kill them. This is egalitarian, but it harms wild-life, especially in Italy, where it is customary to shoot song-birds. Roman Law also leaves rivers open to access by boat; in contrast, in the UK, land-owners own the rivers running through their land, and may prevent access by boat, or, as with some rivers, charge a fee for access.

In other parts of the world, although a lot of land is owned as private property, there are substantial tracts which are not privately owned. Sometimes they are owned by the government, as in the USA and Canada, but in many countries, some land is not claimed even by the government. In Brazil the law recognises the ownership rights of a person who has cleared land and occupied it for a certain length of time. In practice, influential persons often appropriate land which has been settled by peasant farmers.

Laws about private ownership of land vary among legal systems. Under English Common Law, the land-owner cannot own land as such, but only ownership rights in land. The most complete title to ownership is ownership in 'Fee Simple' which is usually described as 'Freehold Ownership'. The underlying idea is that the sovereign is entitled, as in the feudal system, to dispose of land as he sees fit. If a person owns the freehold of a plot of land, and no rights have been sold off, or acquired by the state, then he holds the land 'Ab Infero ad Superos' (i.e. 'From the Depths to the Heights') which means that he holds whatever lies under his land, and whatever lies on and above it. Several individuals may have ownership rights in the same plot of land; e.g. one person may own the freehold, but another person may have a right of way over the land, and a third person may have acquired the mineral rights. The English Common Law would allow a land-owner to prevent aircraft overflying his land, but statute law has been introduced to allow overflying. In Britain, statute law also makes the state the owner of coal, gas, and oil, although the land-owner retains rights to other minerals. The law of the USA allows outright ownership of land, but land may be acquired by compulsory purchase if the government needs it. Following English practice, the land-owner in the USA owns the mineral rights under his land. In Latin America mineral rights are owned by the state. The way in which the law of a country deals with land and natural resources is

important, because it shows one model in practice. Each system has rules for dealing with what might be called 'Occupied Land' (i.e., land which has already passed into private ownership) and also for dealing with other land. The differences in property law found in different countries show that there are several possible models for property law. There is no reason to think that one model is better than the others in all respects.

Identifying the Problem

The problem is that, unless action is taken, the Remaining Commons will be, increasingly, the scene of violent conflict. Conflicts over land occurred in the earliest times recorded and still take place today. Rapid population growth exacerbates strife, or is used as a pretext for it. States disagree about which of them shall control particular natural resources. Disputes occur between groups within states over the ownership of Occupied Land, over the control of the Remnant Commons within a country, or over the allocation of the Remnant Commons to private owners. As other resources run out, progressively greater pressure will be brought to bear upon the Last Commons. Conflict will be inevitable. Some kind of ad hoc 'solution' will arise, but it will not be optimal in terms of equity or efficiency, and it may lead to lasting resentment from the losers. It might also be ecologically unsound, damaging natural resources irretrievably.

Conflict is already occurring in the Remnant Commons. In England, conflict is low-key (i.e. no one has been killed over this issue) but it does occur; the attempt to give the public the right of access to all the commons, has so far, been blocked, as a result of lobbying by land-owners. A demand for boating access to the upper stretches of certain fishing rivers in the North of England has also been opposed; the land-owners include local authorities, and some conservation groups support them, fearing damage to wild-life habitat.

It may be illuminating to see what happened in the past, when the Remnant Commons of those days were parcelled out. In England, the process of introducing exclusive private ownership to what had formerly been commons (i.e., the enclosures of the 18th and 19th

centuries) was attended with violence or with the hardship of the dispossessed. Earlier enclosures, during the 16th century, had also led to distress. Much the same happened in Scotland during the Highland Clearances. In Germany, enclosures took place in the early 16th century, during the life-time of Martin Luther. The rulers of Germany introduced Roman Law to Germany, in place of the traditional German Common Law, which was similar to English Common Law. Commons existed in Germany, as in England. But, because Roman Law did not recognise common ownership, this was taken as an opportunity to turn all the existing commons over to exclusive private ownership. The land-lords gained at the expense of the peasants, who were not prepared to accept this. Aroused by other grievances too, the peasants went to war against their rulers in 1625. The rulers won this war, and suppressed the peasants.² For three centuries, ordinary people had no part in political life in Germany, so there was no development of the democratic process. The evil consequences of this are apparent up to the present time.

Conflicts about land, especially about the Remnant Commons, occur all over the world. In Canada, where the rights of the indigenous peoples have been respected as compared with other countries in the Americas, a small but significant struggle took place in the late summer of 1990. Oka, a town near Montreal, wanted to take over land for extending a golf-course, but the Mohawk Indians claimed this land as their own. In the conflict, a policeman was killed. The Canadian Government resolved the problem by offering to buy the land. In Brazil, the tropical forests of the Amazon are being destroyed at a record rate. Cleared land can be taken into private ownership as farm-land. There has been much dispute over this cleared land, with wide-spread violence and murder. What is happening in Brazil is that the Remnant Commons are being taken over as privately owned land. It could have been predicted that this process would involve violence, as it has done in the past.

In Asia, too, there is conflict over the tropical forests. The forests are falling to the chain-saw in Malaysia, the Philippines, Indonesia, and India. There is pressure on the forests as a source of timber, both for local use, and for export to the developed countries. Clearance lets local land-owners take former forest-land for themselves. Privately-owned land is the main source of wealth and power in most

societies; anyone who can grab part of the Remnant Commons for himself, or herself, has achieved a short cut to these advantages.

In Africa there are disputes over land. Land was a major factor in the conflicts between the indigenous peoples of Africa and the colonial powers. The colonial powers introduced private property in land to areas where land had traditionally been the collective property of the tribe. In Kenya, the Kikuyu strongly resented the acquisition, by British settlers, of traditional tribal lands, even though they themselves were not using the land at the time. White ownership of farmland was, and is, a grievance in Zimbabwe. Land is a serious issue in South Africa.

If we turn to the seas rather than the land, disputes over fisheries occur all over the world; the 'Cod War' between Britain and Iceland led to the exclusion of British fishing boats from their traditional fishing grounds off Iceland. Despite the loss to British fishermen, who received no compensation from the Icelanders, and little from the British government, most observers would probably sympathise with the Icelanders; for fishing is their main way of earning a living. In the Pacific, the use of drift nets has caused disputes between Japan and the various Pacific islands, since it interferes with traditional islander fishing practices. The Falkland Islands have recently demanded an extension of their territorial limits to 200 miles, in order to get the full benefit of their stocks of fish. Most of the Latin American countries extended their territorial limits to 200 miles as far back as the 1940s. Everywhere, fisheries, already suffering from the effects of pollution, are being over-exploited because of growing demand for fish, technical advances in detecting shoals of fish, and government subsidies to fishermen. Pressure builds up on the stocks that are left. British fishermen have suffered from European Community rules, because traditional British fisheries are treated as part of the EC common fisheries, and the quota allocations have been relatively more favourable to French fishermen than to British ones. In 1990, there was conflict over Spanish trawlers fishing in waters that Britain has traditionally claimed as its own.

The UK has gained from the allocation of the sea-beds for oil exploitation. There were some disputes over the North Sea, but these were settled amicably. However, the Scottish Nationalists point out that, on the basis of existing national boundaries, most of

the UK's oil belongs to Scotland. Independence for Scotland would probably lead to conflict over this issue.

There has not yet been much conflict over Antarctica, or Outer Space, but no doubt it will occur.

Throughout the world, the pressure is not only on the Remaining Commons; it is felt also by owners of Occupied Land. Land reform is demanded in many parts of Asia, Latin America, and some parts of Africa. Population growth fuels the pressure. Conventional land reform has not proved a panacea for existing ills. Unless the correct measures are employed with respect to the Remnant Commons, controversy over their allocation will cause strife within countries. Unless sound laws are adopted with respect to the Last Commons, their partition will lead to conflict between countries. In view of the injustice, violence, and war which have hitherto been associated with the sharing-out of the Earth, now is the time to think carefully about how to handle the Remaining Commons.

The Reasons Why There Is a Problem

There are three main reasons. The main one is the current size of the human population of the Earth, and its rapid rate of increase. The population of the Earth exceeded 5 billion people by 1990. In 1989, the population growth rate was 1.74% per annum. If this growth rate persisted to the year 2000, world population would exceed 6.3 billion. If the growth rate then fell, to around 1% by the year 2025, world population by that year would be 8.5 billion. But if it increased, to 1.9% from 2000 onwards, total population would be nearly 9.5 billion by the year 2025.³

Population forecasts have been wrong in the past. Growth rates may slow down quicker than expected. Natural methods of birth control, which have the advantage of being harmless and costing nothing, may be correctly used.⁴ The introduction of even small old age pensions in poor countries would give parents more confidence in the future, and encourage them to limit their families; large families are often a way, not always effective, of insuring against poverty in old age. Generous old age pensions and low birth rates are often found together, as in West Germany. In Latin America, Uruguay stands out from the other countries because of its generous

old age pensions; it also has the lowest rate of population increase in that continent. In both India and China sons are preferred to daughters. It is reported that women have selective abortions to avoid having daughters; this practice will limit future population growth. Even so, world population will increase substantially in the next fifty years. For hundreds of millions of people, standards of living are low at present; if standards are to improve, allowing also for the extra people, it will be necessary to use existing natural resources better, or to reduce the pressure on resources for non-essential purposes, or to make use of resources which are under-utilised at present. The third possibility will probably be the one that receives most attention. This leads on to the second reason for the problem; the inefficient use of land.

If resources were properly managed, the use of the Last Commons would not be necessary yet; but this requires efficient use of Occupied Land. It also requires better use of the Remnant Commons. Turning the Remnant Commons into privately-owned land might improve efficiency overall, but it could have disastrous consequences for many people.

It is easy to think that people push into unoccupied areas because their territory is already used to its maximum capacity. In discussions about the Amazon, students, who are, presumably, better informed than the average person, take this for granted. They point out that many people in Brazil are very poor and then go on to argue that this justifies exploitation of the Amazon by the Brazilians. The underlying assumption here is that, when people reach the limit of their resources, they are entitled to move in and exploit under-utilised resources elsewhere. Yet existing national boundaries are taken for granted; no one argues that poverty in Brazil entitles the Brazilian government to take territory from Uruguay, which has a small population relative to its resources.

England is densely populated, yet not all land is used efficiently. Anyone who takes a few train rides will see substantial areas of rural land which are so overgrown with bracken or weeds as to be unsuitable for rough pasture, and extensive areas of urban land, even in London, which are either used for low-grade purposes such as repositories for derelict motor vehicles, or are unused altogether, sometimes over many decades.

There is nothing new about inefficient land use in the British Isles. The 19th century land-reformers offer tomes of detailed evidence to show that agricultural production was less than it could have been, largely because of an unjust system of land tenure. Most of the land was held in huge estates by a small number of landlords. The land was let to tenant-farmers, who employed farm labourers, usually at very low wages. Much land was legally entailed, which meant that the landlord could not sell it, ownership being vested in his infant child, or in a child that he had not yet fathered. Thus his tenants could not buy the land nor could they improve it, as they could not borrow for improvements, because lenders were reluctant to lend to tenants with no legal security of tenure, and rent payments to the landlord took legal priority over interest payments. There was money in Britain for lending, but much of this went abroad. Despite these problems, many tenant-farmers achieved a reasonable degree of prosperity; they may have started with more capital than the typical tenant-farmer, they may have been very hard-working, or have had good landlords. In England, some landlords gave effective security of tenure, and probably many charged less than the market rent. Even so, tenant-farmers often lived in squalid houses, with poor accommodation for their live-stock. Fields remained undrained, although drainage would have improved productivity. Most landlords tried to maintain a higher standard of living than their rent rolls could cover, and they had no spare money for improvements. The situation in Ireland, except for Ulster, was abysmal; the law was biased against the tenant, who could be evicted without cause, and who received no compensation for improvements when he was evicted. Rents were set at the full market level.

Huge estates still exist in Latin America, notably in Brazil and Argentina. These estates cause even worse problems than did the great estates of 18th century England. The land-owner has more land than he can use efficiently himself. He lets some of the spare land to peasant farmers, on terms unfavourable to them, often on a share-cropping basis. Much land is out of use altogether. There is no agricultural improvement; the landowner spends his money on other things, and the tenants have no spare money. These tenants are mainly poor peasant farmers.

There is an answer to the problem of unused, or underused, land.

It is to tax land, and replace most, or all, other taxes with the Land Value Tax (LVT). This would break up big estates, reduce taxes on producers, and encourage efficient use of land in both cities and country. Everywhere in the world, there are powerful political forces making it difficult to introduce this essential reform in the near future. However, the LVT provides an equitable and efficient solution to the problem of the Remaining Commons.

Another reason for the problem of the Remaining Commons is that there is a conflict of uses for them. As well as being a source of raw materials, they are used as a sink for waste products. The oceans are used as a dump; the UK disposes of more than 10% of sewage straight into the sea without treatment. Formerly, it was claimed that viruses in sea water died in a few days; it is now admitted that they can survive for several months. The oceans receive waste oil from ships, and oil spillage is a constant hazard, as the Exxon Valdez disaster in Alaska showed. The oceans receive other waste such as chemical clouds blown out to sea. Increased pressure on the Remaining Commons as a source of raw materials is matched by increased pressure on them as a sink for waste products. It is possible to turn a park into a rubbish tip; or vice versa, as when derelict land is reclaimed for recreational uses. But it is not possible to enjoy a piece of common land both as a park, and as a rubbish tip. The same is true of the oceans. Increasing use of the oceans as a sink will interfere with their use as a source of materials, and as a recreational area. The atmosphere is also used as a sink for waste; as human beings are dependent on the atmosphere even to survive, an objective observer might well be astonished at how easy it is for persons, companies, and governments to pollute it. This pollution causes destruction of the ozone layer, which is essential for human life on Earth; this is very poor 'Planetary Housekeeping'. Some method must be found of reducing pollution of the atmosphere, and of the oceans. Only a concerted international effort will avail. Outer Space is already polluted; the amount of debris is substantial. Some of the debris falls to Earth, where it may cause a disaster, and lead to large insurance claims, but most of it remains in orbit, where it continues to be a hazard to communications satellites. There is no rust, and not much decay, in space.

Greater self-discipline from human beings, the spread of infor-

mation, and the use of the best available technology, are essential for overcoming pollution. Changes in the tax system would help; taxes could be increased on activities harmful to the environment, and reduced on other activities. In the UK, and elsewhere, all sewage should be treated properly. Other changes will be needed too; one interesting proposal is to return drained lands to their original wet-land state; the restored wet-lands could then filter out nitrates from the rivers. New technology will reduce waste; it should be possible to burn coal with less pollution. Ensuring that all countries use the best available technology could cut pollution significantly; at present, China produces more pollution from burning coal than France and Germany together. It may be necessary to revert to simpler technology in the West; as compared with water-borne sewage systems, the 'honey cart' method of the Far East does not pollute the oceans.

The Pressure for a Solution in the Near Future

The pressure for a solution to the problem of the Remaining Commons has two aspects; there is the irrational force of population pressure, and the rational force of persons, groups or governments who seek a solution.

It cannot be taken for granted that existing agreements represent a solution to the problem of the Last Commons which is desirable, or even feasible. It will take time to find out what the right solutions are, and time to implement the solutions; there are substantial time lags in reforms of this kind, they need co-operation between countries, regional groupings, and the international bodies. It is not too soon to begin thinking now; to assess proposals already put forward, to suggest other ideas, and to try to weigh up the various possibilities. A good solution for the Last Commons will show how the problem of the Remnant Commons should be solved; therefore, the emphasis here is on the Last Commons.

Finding a Solution

The Solution-Generating Process A solution to the problem is more likely to be found if the correct procedure is used. The aim is to

find a sound framework of property rights within which utilisation of the Last Commons can take place.

First, there must be a search for possible solutions. It is important to include solutions even if they seem to be politically difficult, or likely to upset vested interests. Any scheme for dealing with land or natural resources is bound to face these problems. A systematic search would include solutions already put forward, ideas based on a priori reasoning, and schemes adapted from analysis of empirical evidence. The evidence should come from a comprehensive study of methods of dealing with land and natural resources in various parts of the world in the past and the present.

The second step is to establish the decision criteria that are to be used for selecting acceptable solutions. It is necessary to be able to accept or reject solutions, and also to be able to rank order those solutions which are accepted. The criteria should be chosen on rational and consistent grounds, they should be simple to understand and apply, and, once chosen, they should be followed scrupulously.

The third step is to apply the criteria to the solutions proposed. This might be done as a two-stage decision process. Start by screening possible solutions for obvious non-starters. Then, having worked out each remaining solution in detail, analyse these solutions systematically, to accept or reject them, and then to rank the accepted solutions in the preferred order.

The correct approach is that of cost-benefit appraisal. This is the only way of allowing for the major ecological, economic and political implications of making use of the Last Commons.

Cost-benefit appraisal is similar to conventional investment appraisal, where forecasts are made of cash flows, and an investment is accepted only if it yields a positive net present value (i.e., the discounted value of all expected inflows of cash must exceed the cost of the initial investment). The difference is that Cost-Benefit appraisal includes also estimates for, not only all cash benefits, but all social benefits of the project; e.g., if a new transport system will reduce road accidents, an estimate should be made of the value of lives saved. Cost-Benefit appraisal allows for social costs as well as cash costs; e.g., if a project will harm the environment, an estimate is made of this cost. Estimates of social benefits and costs allow for factors

which might otherwise be ignored. Benefits and costs should be evaluated in cash terms, because money provides a common measure of value, and investments, however socially desirable, use funds which might buy other things. Once the relevant information is put into cash figures, analysis becomes easier. It is possible to identify trends, and to make forecasts. Political aspects must be considered, both qualitative — e.g., what range of views do governments have on a given topic — and quantitative — e.g., how many countries take a particular view. It is necessary to appreciate the situation as it is, or potentially could be; and not to 'situate the appreciation' (i.e., to engage in wishful thinking, and pretend that things are as the observer would like them to be).

The last step is to consider how the chosen solutions can be implemented. There will be political constraints here, as with other cost-benefit studies. There may be, not one best solution, but several good solutions. It makes sense to try various solutions, so as to find the best one by trial and error. New technology will arise from the challenge of using the Last Commons, and this will determine which solution is the best. Trying out several solutions reduces risk, because it allows for a second chance. Picking one solution because it looks best at the outset could be unwise; if this turned out to be the wrong solution, it might be too late to try one of the other solutions.

The Decision Criteria The decision criteria for evaluating solutions should not be based on ad hoc analysis, or on 'muddling through', but on principles which are plausible in terms of evidence, and logically consistent. The policy-makers can leave companies and institutions to maximise return on their investments; the task of the policy-makers is to establish the 'Rules of the Game'. There might be different sets of rules in different parts of the world, or for different areas of the Last Commons. It is appropriate to talk about 'Rules of the Game' in this context; Henry George explains that

They [the Physiocrats] were the authors of the motto that in the English use of the phrase 'Laissez Faire' 'Let things alone' has been so emasculated and perverted, but which on their lips was 'Laissez Faire, Laissez Aller' 'Clear the ways and let things alone'. This is said to come from the cry that in Medieval tournaments gave the signal for combat. The English phrase which I take to come closest to the spirit of the French phrase is, 'A fair field and no favour!'.⁵

Thus, laissez-faire implies not the absence of rules, but the presence of fair, impartially-applied, rules.

The rules should reflect a proper understanding of the nature of man, and of the nature of nature, and of the ways in which man interacts with nature, and human beings interact with each other. The crucial fact about nature is that resources are inherently limited, and everything runs down; 'Entropy is Time's Arrow'. To understand nature, freedom is necessary, because a political system that does not respect freedom of speech, of publication, and of association, will limit the acquisition of knowledge. Sir Karl Popper has explained why freedom is necessary; putting the matter simply, no one can be sure of the truth in any field of knowledge, and there is no hope of finding the truth without freedom of enquiry. Experts or governments do not have special access to the truth; there are many cases of experts — and governments — being wrong.

At present, no one has adequate knowledge or experience to deal efficiently with the Last Commons. What is needed is to accept that mistakes will happen, but to arrange matters so that mistakes can be identified early. Even after solutions are implemented, the approach should be like that adopted for new drugs that are brought into use; all reports of unexpected side-effects are reported to a central body. In advance of implementation, possible solutions can be judged both in terms of a priori considerations, and in terms of evidence. The social sciences provide ways of assessing possible solutions. They make it possible to assess solutions in terms of plausibility of assumptions, likely consequences, and consistency with existing knowledge of how human societies work. Moral philosophy offers a guide to ethical aspects. History provides evidence. It records the crimes and follies which have been committed in the past whenever the commons of that period were transferred to private ownership, and thus provides a lesson about what not to do.

Decisions need objectives; decisions relating to the Last Commons are so important that they should be explicitly targeted at a major goal; indeed, what may properly be regarded as the major goal viz. a human society which is ecologically sustainable in the long-term. This objective signals one essential decision criterion; that the solutions chosen should be ecologically sound. For simplicity of reference, this criterion is 'Ecology'.

It is possible, even probable, that a society which is ecologically sound will be unsatisfactory in other ways. Two other criteria must be added; these are the ones used when assessing tax or welfare reforms; they are 'Equity' and 'Efficiency'. Equity means justice and fairness; definitions vary depending on a person's underlying values about political philosophy, but equity must be a criterion, because ethical issues ought not to be ignored. Efficiency is easier to handle; gross inefficiency is easy to identify. Time is wasted, or materials are damaged; shortages occur, or quality is poor. People may agree about issues of efficiency, even when they disagree about equity issues. Ecology, equity, and efficiency are distinct, yet linked.

A given policy might seem efficient in the short run, yet, if it is inequitable, it will not be efficient in the long-run. A policy which looks equitable will not last in the long-run unless it is efficient. Irrespective of whether a policy is equitable in the short-run, efficient in the short-run, or both of these; it will not last in the long-run unless it is ecologically sound. A human society which is sustainable in the long-run must recognise ecology, efficiency and equity*. The symptoms of failure in any of the three criteria are the same as always; poverty, famine, violence, war. Failure to allow for ecology leads to degradation of the environment, which becomes progressively less able to support even the existing population.

At one time, war, although always a negative sum game, enabled some people to gain at the expense of others, by seizing their resources. Under modern conditions, gains are few, and the risks are high. Experience shows that trade is better than war; it gives people access to resources without having to fight. It lets people sell what they make, and buy what they need. Trade weakens the case for war, and undermines the position of the warmongers. Trade requires the recognition of private property rights. Private property rights are also necessary for efficient production; state production is inefficient by comparison. But private property rights can exist without outright ownership of resources. Ownership is not necessary for a person to use resources efficiently. What is necessary is security of tenure; the guarantee that the producer will be able to enjoy the

*'Ecology' is a subdivision of 'equity', in the sense that it is intergenerational equity as applied to the natural environment.

benefit of his labours. In the case of the Last Commons, the producer can enjoy security only if there are laws to protect him. Unless the laws are adequate, the potential producer will find other fields for his endeavours. The rule of law must be maintained; good laws are of no value unless they are enforced, and enforced impartially. The producer needs to be confident that he can pursue his activities in peace as long as he obeys the law.

These points must be taken into account when solutions in terms of Equity and Efficiency are being assessed. Allowances must be made for adequate incentives, and for the need to cover all costs. Development of the Last Commons will need new, and expensive, technology. It will present serious risks. Inventors and producers will not incur these costs, and face these risks, unless they can reasonably expect a good return.

To sum up; assessment of possible solutions must be based on the three criteria of equity, efficiency, and ecology.

A Review of the Possible Solutions Each solution proposed should be presented in the form of a model (i.e., a simplified version of the arrangements that would be applied in practice). Models leave out details, but stress the main points of the underlying ideas, so making comparisons easier. In reality, any solution would involve an immense amount of complex legislation.

Models should be assessed in terms of the decision criteria. The three obvious models can be described as; 'Free for All'; 'Common Heritage of Mankind'; and 'Business as Usual'. The emphasis here is on the seabed; if a good solution could be found for this, it could be applied also to Antarctica and Outer Space. Parts of the sea-bed have already been claimed by nation-states, and commercial exploitation is taking place. The deep ocean sea-bed has not yet been claimed, but commercial exploitation could feasibly take place there.

The sea-bed is divided as follows. The continental shelf is that part of the continental margin which is adjacent to the coast; it may be no more than 100m. deep, or as much as 300m. deep. Beyond the shelf, but still part of the margin, is the continental slope. Beyond this is the rise from the oceanic abyss. The abyss mostly lies at a depth of 300 metres, or more, below sea-level. The width of the continental

shelf varies greatly; to the west of Europe it is wide — e.g., it extends to 320k. west of Cornwall — yet it is little more than 1k. wide off parts of the western coast of South America. The term 'sea' is used for those parts of the seas that lie adjacent to coasts, such as the North Sea or the Red Sea. The terms 'ocean' is used for the great expanse of the seas; there are five oceans; the Pacific, the Atlantic, the Indian, the Arctic, and the Antarctic. Much of the continental shelf has already been divided up amongst nation-states; the question is what should be done with the rest of the ocean sea-bed.

Professor Denman discusses the 'Sea-bed Resource', considering the economic potential of all sea-bed, not only that under the deep oceans.⁶ The superjacent waters allow passage for ships; they provide a habitat for seaweed, such as kelp, for pelagic fish, such as herring, for demersal fish such as plaice, and for shellfish such as lobsters; moreover, sea water can be desalinated, and salt extracted. Waves can be used to generate electricity. The sea-bed is a source of minerals, sand and gravel from coastal areas, oil from the continental shelf, and manganese, nickel, cobalt, and copper, from the ocean sea-bed. The sea-bed provides a basis for structures, such as harbours and marinas, oil drilling platforms, industrial plants, and housing. The seas are used also for submarine cables.

The 'Free for All' model means that governments do nothing about the ocean sea-bed. A real-life example shows the likely outcome from this model. An American company made a claim on a section of the ocean floor intending to bring up the manganese nodules lying there. It abandoned this scheme when it learnt that the US government would not recognise its claim. No company will invest large amounts of money unless it is sure that its government, or some other government, will protect its investment. The utilisation of the ocean sea-beds, of Antarctica, and of Outer Space, will all require large amounts of investment. Companies might, in theory, build up their own private armies to protect their investment, as the British East India Company did, but the 20th century state is jealous of its power, and would not let companies do this. This model would mean non-use of resources.

The 'Common Heritage of Mankind' approach has been held up as the ideal model. It is the basis of the United Nations Law of the Sea Convention (UNCLOS III), which had been introduced, and signed

by a majority of the UN member states, by 1983. Only a few had ratified it. Many of the Western nations, including the USA and the UK, were reluctant to sign, let alone ratify, this Convention.⁷ UNCLOS III envisages the creation of an international authority, the 'International Seabed Authority', which would have exclusive powers to grant access to the resources of the deep oceans. The ISA would have an operational arm known as the 'Enterprise', to engage in mining and other commercial activities on its behalf. The Enterprise would compete with national corporations and private sector companies. The Authority would control the ocean sea-bed, and would be the sole source of licences to exploit it. A company which wanted to mine a site would have to pay substantial fees and royalties to the ISA, and also offer the Authority half of the site, which the Authority could mine for itself. The company would have to supply the Authority with the technological know-how with which to exploit this site. This scheme would not interfere with the right of passage for ships, nor with fishing.

The proposal to treat the ocean sea-beds as the Common Heritage of Mankind was put to the UN in 1967, but the idea had been promoted before this, by the movement for world federalism. This concept underlies the 1979 Moon Treaty, which calls on nation-states to establish a joint management system 'to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible'. It has been suggested that this principle should apply also to the Geo-Stationary Orbit for communications satellites, which is becoming congested, and to the exploitation of Antarctica. The model could be applied to the tropical rain-forests.⁸ This could be an answer to the problem of the Remnant Commons, but it would be opposed by national governments. The Common Heritage approach aims at protecting the environment, while encouraging development in the less-developed countries. Revenues raised from use of natural resources would be used to finance this development.

UNCLOS III acknowledged that nations are claiming more of the seas than they traditionally did. It introduced the 'Exclusive Economic Zone'; this can extend up to 200 miles from the coasts, and the state can control fisheries within this zone, as well as the sea-bed. If the sea-bed is still on the Continental Shelf, sovereign rights can

extend beyond this, but operators exploiting sea-bed minerals would make a payment to the ISA.

Professor Denman criticises the Convention on the grounds that: the ISA would be an international public monopoly, which would slow down development through inefficiency and bureaucracy; the Enterprise would present unfair competition to companies, who would be expected to hand over their new technology to the ISA for nothing; the ISA might interfere with the relevant mineral markets, as new supplies would reduce prices received by the existing suppliers, most of whom are relatively poor nations. He argues that it is unjust that companies which have incurred high costs, and run great risks, should be expected to relinquish much of their profit. He also points out that, as many nations have not signed the Convention the ISA could not truthfully claim to be acting for the benefit of 'all mankind'.⁹ The system probably would deter private enterprise, for the residual rewards would hardly be worth the risk and effort involved. Accurate charts are essential to use of the sea-bed. The charting of the sea-bed is carried out by only a few of the nations, all of them developed ones; most nations do no charting. Few of the Western nations are likely to agree to the Convention proposed; their companies and government bodies are being called on to do the exploration, create the new technology, train the needed personnel, and risk lives and money to develop the ocean sea-bed, and then hand over much of their profit to nations who have contributed nothing. The Common Heritage approach would be open to the same objections if applied to Antarctica and Outer Space.

The Business as Usual model represents what is happening at present, and what has happened in the past. States have divided up the Remnant Commons into exclusive private property, while extending national jurisdiction into the Last Commons, subsequently making private property of these commons too. This was the process whereby the Americas, parts of Africa, and Australia and New Zealand, were occupied by Europeans. Much the same happened when Central Asia was occupied by the Russians and Han Chinese.

This model accepts private property in land, as opposed to the collective ownership of land usual amongst tribal peoples, which has an echo in the Common Heritage of Mankind approach. Business as

Usual is 'corporatist' (i.e., it includes a substantial amount of government intervention) and nationalistic, tending to provoke conflict between nations. It is not based firmly upon free market principles, which presuppose more respect for the freedom of the individual. The relevant unit is the state which creates and protects private property rights in land, in exchange for the loyalty of the beneficiaries. The state favours the interests of existing property-owners. The state is mercantilist, deterring imports by tariffs, encouraging exports by subsidies, interfering with trade and industry, providing benefits to its supporters, and taxing everyone else heavily. The state interferes with property rights — e.g., by planning controls — yet lets property owners escape full responsibility for their actions, by allowing limited liability for companies.

In the 20th century, socialist measures have reversed the movement towards private property; in some countries, Marxist governments have taken the land from existing owners, and treated it as the property of the state. In the UK, some private property, although not land as such, has been nationalised. But state control of property leads to inefficiency, and the trend towards private property has now been resumed. The collapse of Marxist governments will allow the restoration of private property. Privatisation in the UK has been copied elsewhere. Even so, the state is now so extensive that, in every country, much land is owned by specific government bodies. In the USA, the Federal government still owns large amounts of unoccupied land. Private property rights in land are always subject to the power of the state, which can acquire property by compulsory purchase.

Business as usual was the method used by the English and other European settlers in what is now the USA. They found a large region with a relatively small Amerindian population, who made use of the land as it was needed. The colonial process of carving up the land into private ownership might have taken place on the criterion of effective occupation, wherever land was unoccupied, but it did not. The land was deemed to be the property of the king, who distributed it to his friends or financiers. The American Revolution could have introduced occupation as the basis of ownership, seeing that this is what Locke recommended. Instead, the government of the USA took over the land-granting privilege, and treated

unoccupied land as belonging to the state, so that persons who wanted it had to buy it. The claims to land of the indigenous peoples were largely ignored. The system was not ideal for the settlers either. A person could clear land, live on it and cultivate it for several years, and then suddenly find that someone else had acquired title to the land by purchase or grant from the government. The purchaser got the land cheaply, and could enjoy the improvements made by the original settler. He might hold the land for speculative gain, rather than using it himself. Even so, the USA developed the most successful economy that has ever been known. Thus Business as Usual is associated with economic success, and must be rated relatively efficient. Critics would argue that it is less satisfactory in terms of equity and ecology.

This model can include a free market variation. This has been observed only fleetingly in reality, but it would be superior to the existing practice in terms of equity. If the state intervened less in the economy, and levied lower taxes, especially on earned income, persons without property would have a better chance of acquiring some, and they would enjoy a higher standard of living. The essence of a free market system is that people pay for what they get. On this principle, property owners should pay for the property protection services of the state (i.e., for national defence and for law and order). The UK and the USA were close to being free market economies during the 19th century, but in neither country were the essential services of the state financed in this way. This model would mean that nation-states extended their territory out from the continental shelf into the rest of the continental margin, and then into the abyss. Trenches in the ocean floor would be used to demarcate national boundaries. Coastal nations would gain an immense amount of territory; the seas and oceans cover 71% (361m.sq.k.) of the Earth's surface, as opposed to only 29% (149m.sq.k.) for the land. Land-locked states might well be aggrieved, especially those such as Bolivia, which would have had a sea-coast, but for historical bad luck. The UK, which has a relatively large amount of continental shelf of Europe, would get a substantial section of the Atlantic floor, although Eire would do even better by comparison with its existing land area.

Business as Usual is unsatisfactory in terms of efficiency and

equity. Also, it makes two political assumptions which are both unrealistic. First, it assumes that the nation-state is the natural unit of government, whereas history shows that the nation-state is relatively modern; tribes, city-states and empires existed previously, and lasted for long periods of time. Second, it assumes that existing nation-states are natural units. This can be challenged, by reference to states in Africa or Asia, or to the situation in Northern Ireland. Governments might like everyone to accept the legitimacy of existing nation-states, but not everyone does. When a nation-state lays claim to some part of the Last Commons, its claim may be disputed. Within a country, the central government may find that its control of natural resources in a region is challenged by the minority nationality who live there.

'Land and Liberty': the Foundation for the Right Solution The three obvious models all fail in one or more of the criteria; equity, efficiency, and ecology. Yet there are models which would be satisfactory on all three criteria. The basic model here is 'Land and Liberty', but it could give rise to several variations.

The essential idea is that what a person creates, using his or her talent and effort, belongs to that person. Conversely, what no-one has made, cannot belong to anyone. No person made the land, using 'land' in its comprehensive definition (i.e., all natural resources) and therefore no-one can own the land. This does not mean that the land should be nationalised; the state did not make the land either. What it does mean is that no person should be able to appropriate the 'economic rent' of the land (i.e., the rent which is paid by the user, not for assets or other services provided by the land-owner, but purely for the 'privilege' of gaining access to the land). Economists have misused the term 'economic rent', pretending that the return to a person's inherent talent is also a form of economic rent; in truth, it is a quasi-rent. The term 'pure rent' is less ambiguous. Pure rent is a payment for the use of unimproved land, a payment with nothing in return. The land-owner who lets someone cultivate a piece of derelict land is charging pure rent, for he provides no services in exchange. The term 'ground rent' is used in ordinary parlance, to mean a payment purely for land. A tax can be defined as a payment with nothing in return, so pure rent is similar to a tax, but, unlike a tax, it

is taken by private individuals. It is a quasi-tax. The Land Value Tax is the best way to prevent private individuals from appropriating pure rent; it can replace other taxes, thus removing the burden of government from people whose income comes from their own endeavour. The LVT does not hinder the working of a market economy; it enables it to work more effectively. People can enjoy the full value of their own efforts, without paying any tax. People who want to hold land have to pay the LVT, irrespective of the use they make of it. They have an incentive either to use land efficiently, or to relinquish it. Buildings and other improvements would still be bought and sold, as the LVT does not fall upon these items, but only upon the land itself. In practice, the LVT should not take the whole of the annual value of the unimproved land (i.e., the annual value of the pure rent); if it took most, but not all, of the value, there would still be a market price for land, and a market in land, which would allow transactions in land without interference from the state. Prices would be very low, compared with what they are now. The selling price of land, in a free market, is always a given multiple of the net pure rent (i.e., pure rent after allowing for taxes and any management expenses) that can be obtained from that land. Land and Liberty is equitable; it respects the freedom of the individual, and lets each person keep what he or she produces. It is efficient; every individual has a strong incentive to create and produce, and there is no fiscal hindrance to the operation of the market economy. The government would take the pure rent on land, using it to pay for essential services, such as defence, and law and order and perhaps some others. The government would estimate annual land values, and determine the right tax rate. If the land market was able to operate freely, price discrepancies and price fluctuations would soon show whether the estimates and the tax rate were correct.

The LVT is usually envisaged as a tax upon Occupied Land, but it could be applied equally well to the Remnant Commons within a country, and to the Last Commons. However, if extended to the Last Commons, this model would share a weakness with the Business as Usual model, viz., that the right of the nation-state to control particular areas of land, or sea-bed, may be challenged.

This model could work as follows. The state, having claimed the continental shelf as its territory, would chart the sea-bed accurately.

It would then divide up the sea-bed into sectors, and announce that it was selling leases for each sector in turn, at say, at one-year intervals. Each sector would be sub-divided, and the state would sell individual sections, preferably by open auction to the highest bidder. Navigation would still be free, but otherwise a section should include the complete sea-bed resource (i.e., the superjacent waters as well as the sea-bed). The state would announce what ground rent had to be paid for the first twenty years, and warn that all leases would be renegotiated at the end of that time. The highest bidder for a section would be free to use it as he wished, or sell it to some one else. Provided that he paid his ground rent each year, he should not be asked to pay any other taxes — e.g., corporation tax. At the outset, there would be a general lack of knowledge. Relative to the pure rent, some buyers would find themselves paying too much ground rent, and others too little. The price of existing leases would reflect whether the ground rents were unduly high or low. Investors would have a strong incentive to learn, for both risks and rewards would be high, and, over time, the market in leases would approach an efficient market, provided that there was competition amongst initial bidders, and in the secondary market. This method allocates resources to those who believe that they can use them efficiently, and it penalises those who are wrong in their belief. A lease of twenty years gives time for investors to benefit from their development activities, and offers the government a second chance to set ground rents, if these were too low originally. If the government wanted to evict a lease-holder when his time was up (i.e., without giving him the chance to renew the lease) it would have to compensate him for the residual value of any usable fixed capital, but if he left derelict structures behind, it would charge him for removal. The same method could be applied if the state took over part of the ocean sea-bed, and also if it took territory in Antarctica or the Moon.

A variation is that nation-states collect the ground rent, keep part of it, and hand the rest over to an international body. This would accord with the Common Heritage of Mankind approach. As compared with the UNCLOS III proposals, it is more comprehensive, for it could apply to the ground rent from the continental shelf as well as to the ocean sea-bed. This variation recognises that there is no good reason why a particular nation-state should enjoy all the

ground rent from its adjacent sea-beds. However, nation-states with substantial sea-beds would be reluctant to hand over large sums of money to a UN subsidiary. They might point out that many of the UN member states are controlled by corrupt or tyrannical governments, which would use the money either to buy arms or to enrich themselves. They might argue that countries which have done nothing to find, explore or develop these resources have no moral claim to them.

A compromise would be for nation-states to put part of the ground rent into a special international fund, with trustees appointed by themselves. The trustees would be 'Four Just Men', probably more than four, and including women; they would be appointed on their personal merits and experience. This 'World Welfare Fund' would have designated uses for these funds, such as disaster relief, the purchase of land for nature reserves, or the financing of scholarships. Funds could be used for research and development of general benefit, in areas such as earthquake prediction, control of pollution, conservation of the environment, alternative technology, utilisation of space, or protection of the Earth from disasters such as global warming or asteroid strikes. Countries reluctant to contribute to the international fund might devote part of their ground rent to similar types of activity or research, setting up designated funds at the national level. This would allow decentralisation, and make use of the research strengths of different countries.

The LVT, with revenues paid into an international fund, would be a good way of managing the ocean sea-beds, even if individual states were not prepared to introduce the LVT in the areas of the continental shelf that they are currently claiming. Professor Denman suggests that the International Seabed Authority should be set up as the supreme allocating agency for interests in the ocean sea-bed. It would grant secure interests in the ocean sea-bed, and register all titles, in exchange for payment equivalent to the pure rent. Interests would be sold to the highest bidder. The fund thus raised could be used to assist Third World countries to engage in development of the ocean sea-beds for themselves.¹⁰

There are other ideas which could be included in one or other of these models. The English laws on common land could be adapted to

cover the sea-bed. Just as different people have particular common rights, so people might have particular rights over the sea-bed resource of a section (i.e., as opposed to all the rights). As with the basic model, they could buy leases for these rights, paying ground rent to the state each year, and having the right to sell the leases. There could be clearly designated fishing rights; this would control fishing more effectively than the present quota system, which is open to abuse, may reflect political bias, and is also wasteful — e.g., fish surplus to quota have to be thrown back into the sea, by which time most of them are dead. But fishery consortia which owned long-term leases on a fisheries would be strongly motivated to conserve fish stocks, and their membership would be small enough to co-operate effectively. The right to dump waste at sea would also be for sale, with the ground rent higher, the more noxious the waste. This would reflect the economic principle that costs 'external' to the producer, such as pollution, can be controlled best by 'internalising' them (i.e., imposing specific taxes, or other payments, upon the producer). Fishing consortia would not bid for areas where a lot of dumping took place, so that the government would lose revenue if it charged too low a ground rent for dumping. Rights to extract minerals, or to build structures at sea, would also be for sale; here, too, dumping would discourage bidders. Persons who owned leases on clean sections of sea-bed would be entitled to take legal action if waste drifted onto their sections. Skill and experience would be needed to demarcate specific rights properly, and set ground rents correctly. Potential bidders would be analysing the situation, so that, if ground rents for particular rights were set too low (or too high), secondary market lease prices would be relatively high (or low). This scheme is better than selling off the sea-bed resource as a whole. Only a very large consortium would have both the funds to buy a complete section, and the resources to make full use of it. In contrast, small fishing consortia would bid for fishery rights, and small firms bid for construction rights. This variation would be favourable to economic competition, and thus promote economic efficiency. If countries took different approaches, they might learn from each other.

Existing practice varies amongst countries; thus, in the U.K., the government grants leases in the sea-bed of the territorial sea, but not in the continental shelf outside this, where it grants only licences. In

the USA, the Federal government grants leases for oil exploration in the sea-bed in the continental shelf also. The holder of a lease has more complete property rights than has the holder of a licence — e.g. a lease can be sold. In the USA, leases are sold to the highest bidder; in the UK, so far, licences have been awarded on a discretionary basis. The British government gave away the pure rent, and then tried to remedy this by imposing not only royalties on oil extracted, but also special taxes. Yet in Norway it is possible to hold the sea-bed as private property, although only in water up to two meters in depth.

The LVT could solve the problem of the Remnant Commons too; thus, in the Arctic, ground rent could be paid over to the indigenous peoples such as the Inuit (Eskimo); the case here is not that they own these resources, but that no-one does, and that they are entitled to compensation for the disruption that extraction of resources inflicts on their environment and on their social structure. A similar approach could be adopted in the Amazon. Tribal peoples in the USA have used royalty payments for oil found in tribal lands to improve their standard of living. In Canada, the money might reduce the need for welfare payments, which seem to have had a demoralising effect on the social structure of the tribal peoples.

There are more futuristic scenarios too. In view of the evils that have arisen from the conventional political and economic systems of the past, it might be worth giving less conventional systems a chance to show what they can achieve. There are ways of organising political life other than the nation-state; and, in a market economy, ways of organising economic production other than the limited liability company. There are also; partnerships; co-operatives; friendly societies; trusts; and charities. These might offer an ecologically better way to develop the Last Commons. If Antarctica should be opened up to development, an Antarctic Trust, analogous to the National Trust in Britain, could be set up to control those parts of Antarctica, and the Antarctic Ocean, which would be set aside as conservation areas. This Trust could ensure that no whaling took place, and might offer exotic holidays to the robust tourist. An ecologically sound feature of the LVT is that conservation areas can be completely exempted from tax. It is already possible to build cities on the seabed. Existing nation-states might let some of these

sea-cities be run as co-operatives. Some ocean-cities could become independent states. The UK, which controls so much relatively shallow sea-bed, a total area equal to about twice the area of the dry land, might offer a site for a new 'Lyonesse' in exchange for the appropriate amount of LVT. Some ocean-cities might be run on free-market, minimal state lines, as in the 'Utopia' that Robert Nozick advocates; others could be run on the principles of traditional anarchism, or the more modern 'anarcho-capitalism', which keeps private property and the market system, but does away with the state. Some of these communities would offer free immigration for any persons desiring to go there, a life-line to the many people who find it hard to live in their own countries because of the tyranny of their governments. There are said to be some ten million refugees in Africa alone. A similar approach might be adopted in Antarctica. If these models worked on Earth, they might be used on the Moon too, or in the 'Space Cities' that have been proposed. After that, the Solar System is the limit.

NOTES

- 1 Selected Press Reports on Antarctica; 'Australians to ban polar oil drilling', *The Daily Telegraph*, Monday, August 20th, 1990; 'Airfield "threat to Antarctic"', *The Guardian*, May 7, 1990. The latter reports that the UK is building an airfield at its Rothera Antarctic research station; this is so that scientists will be able to travel there more easily, but critics say it would be an ideal base for mineral prospecting. The British government supports the Antarctic Mineral Convention, which would allow prospecting.
- 2 R. Bainton, *Here I Stand; The Classic Biography of Martin Luther* (Berkhamstead, Herts.: Lion Publishing, 1978), pp.268-270, 280-281.
- 3 N. Keyfitz, 'The Growing Human Population', *Scientific American*, September 1989, pp.70-77.
- 4 'Papal policy, poverty and Aids'; a letter to the *British Medical Journal*, from R.E.J. Ryder; *BMJ*; August 4, 1990, pp.291-292. The writer noted that Mother Theresa's Sisters taught natural birth control methods to low-income women in Calcutta; for 1978, only 34 pregnancies occurred in nearly 20,000 women, a failure rate, at 0.2 pregnancies per 100 women users per year, no worse than that of the contraceptive pill; women are taught how to observe signs of ovulation,

so that they can avoid sexual activity on the necessary one or two days per cycle.

- 5 Henry George, *The Science of Political Economy* (1897; New York: Robert Schalkenbach Foundation, 1962), p.153.
- 6 D.R. Denman, *Markets under the Sea?* (London, Institute of Economic Affairs, 1984. Hobart Paperback, 17), pp.7-11.
- 7 Denman, *op. cit.*, pp.30-38.
- 8 *World Federalism Today* (The Netherlands), World Association for World Federation, 1988.
- 9 Denman, *op. cit.*, pp.38; 56-59.
- 10 D.R. Denman, 'Land Value Taxation in Deep Water', *Land and Liberty*, Nov./Dec. 1984, pp.103-107; 115.