THE ENVIRONMENTAL ALPHABET

by

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A is for **ACID RAIN**

In the early 1980s we were told that the acid rain produced by the burning of sulphurous coal, notably from power stations, would wipe out most aquatic life and destroy forests. The acidity in rain would also corrode aluminium, which would leach into drinking water and cause an epidemic of Alzheimer's disease.

That rain can be acidic has been known since 1848. Sulphur dioxide was established as a possible cause of damage to trees in 1967. Yet the claim often made, that rain has become progressively more acidic over the last 25 years, is based upon deeply flawed evidence. The major study which claimed to establish this, which was undertaken by G.E. Liken, was a very slapdash piece of work full of statistical errors.

What is highly questionable is the notion that acidity in the rain is *entirely* due to human activity, or to the burning of sulphur, even if some part is. Experts take the view that acidity in rain is often caused by natural chemicals in the air being picked up while the rain is falling through the atmosphere. There is a plethora of chemicals found naturally which can have this effect. Even in the case of sulphur, the amount put into the atmosphere each year by industry is dwarfed by what is ejected by a single volcanic eruption such as the Mount St. Helens explosion in Alaska in 1980.

Furthermore, a 10 year study costing $500 million, by the US funded National Acid Precipitation Assessment Program or NAPAP, found that:

- "a firm causal link has proved to be elusive" between acid rain and areas where forests have been dying; forest death was ascribed to drought and other naturally occurring factors;

- acidity in lakes was largely due to minerals in acidic topsoil leaching into the water.

Researchers have also shown that some agricultural crops are actually stimulated by acid rain, and that its effect on buildings is minimal. The notion that acid rain will cause an epidemic of senility is pure fantasy.

The alarm spread about acid rain has been excessive. There seems to be little evidence that the problem is as serious as the scare-mongers would have us believe. Sensible pollution controls, rather than costly panic measures, seem quite capable of dealing with it.

A is for **AIR**

It is popularly believed that air pollution in the most advanced industrial countries is steadily rising and that only draconian government regulation will stop this trend. In fact there has

been a marked diminution in air pollution in the Western world in the 70s and 80s ranging from 12% to 33%, depending on the country.

This decline is not necessarily due to state action; the countries with most environmental regulation have not shown the steepest fall in air pollution. The statistics in fact seem to show that the rate of decline has been slower in the countries with the most draconian regulations.

Air pollution by industry is often attributed to greedy capitalists seeking to maximise their profits. The worst examples have, however, occurred in centrally planned economies. This has been especially true in the case of the ex-communist states of Eastern Europe and the former Soviet Union. Communist states have been producing 3 to 6 times more air pollution than capitalist ones per unit of GNP. This was mainly because profit-seeking businessmen constantly seek to reduce the amount of raw materials and energy used, in order to cut costs. Where industry is state owned, however, there is no such incentive to economize, because no individual directly foots the bill for profligacy.

Air pollution has been steadily going down in the capitalist economies, just as it had been steadily increasing in the planned economies until their abrupt termination. The impact of man's activity on the atmosphere should always be kept in perspective; there are about a million tons of air for every person on earth.

B is for **BIODIVERSITY**

One of the great ecological bogies has been that the loss of species due to the spread of human population together with deforestation would reduce the number of species and thus the diversity of nature. The Global 2000 report to the US President (1980), the source of many unjustified environmental anxieties, said that perhaps 20% of all species on earth will be irretrievably lost as their natural habitats vanish. The fear is that "nature's rich treasure house" will thus be depleted, denying us access to possibly useful plant and animal products, including those which might cure cancer and other diseases.

This assertion is based on virtually no statistical evidence. The extinction of species has been a biological fact for the last 500 million years, during which a rich variety of forms of life has existed on earth. Periodically there have been mass extinctions stemming from a variety of causes, most of which are unknown. In some of these catastrophic events more than 95% of species were wiped out. This is not wholly tragic because some old ones must become extinct to make way for the new. Were it not for the extinction of the dinosaurs 65 million years ago, the human race might never have developed at all.

One good reason for optimism is that, because of seed storage and advances in our understanding of recombinant DNA, it should be possible in future, as it was not in the past, to retain old diversity without reducing the prospects of new variety. We could soon be able to decode the DNA of threatened species and store records which would ensure that useful elements were not lost, as they were in the past.

B is for **BUREAUCRACY**

Radical environmentalists often claim to be hostile to bureaucracy. The policies they recommend, however, invariably call for huge increases in state power and mounting regulation.

Bureaucrats have an appalling environmental record. The sheer awfulness in this respect of the former communist regimes in Central and Eastern Europe is now generally recognised. What is less generally known is that bureaucrats in the liberal democracies have a poor environmental record too. This record is even worse when contrasted to that of private individuals and organisations in the same country. The example of the USA illustrates this well:

- at a time when state governments awarded bounties for killing birds of prey, a group of concerned citizens founded the private Hawk Mountain Sanctuary in Eastern Pennsylvania;

- at a time when state governments awarded bounties for killing seals and sea lions, a commercial enterprise protected the only mainland breeding area for the endangered Steller sea lion;

- while the federal government was encouraging the drainage and destruction of wetlands, between 5 and 7 million acres of wetland were saved by private conservationists and commercial duck shoots.

Many similar examples could be given for the UK. The most glaring ones have occurred when bureaucrats have wanted to force roads through environmentally sensitive areas. These self same areas had often been bought by private individuals and organisations, such as the National Trust, in order to protect them. The bureaucrat has often won these struggles through the very non-market power of compulsory purchase.

Considering the record of the bureaucrat and the state in protecting the environment, there is no reason for anyone to suppose that more controls are the answer to today's environmental problems.

C is for **CLIMATE MODELS**

Forecasts of future global warming are based on computer models of the climate. Many factors have an impact on climatic conditions; even the most sophisticated computer models only include a fraction of all the potential variables. Most significantly, the models have proved very poor at predicting the *present* climate on the basis of earlier data.

Experts point out that, among other weaknesses, the currently used climate models:

- do not take proper account of the role of the ocean in absorbing carbon dioxide in storing and transporting heat and in releasing sea salts into the atmosphere;

- do not adequately simulate the possible effect of clouds, even though most experts are agreed that the heating and cooling of clouds has an impact on climate 5 to 10 times greater than that of all human activities combined, including the burning of fossil fuels;

- assume that increasing the amount of CO2 in the atmosphere will automatically raise the earth's surface temperature, even though this does not correlate with the data for the past century.

These flaws seem to suggest that many such forecasters are less interested in scientific fact than in pushing their own pet theories, usually supporting gloomy scenarios. In fact Chris Folland of the Intergovernmental Panel on Climate Change even said "the data don't matter. We are basing recommendations on the models". Chris Folland is a leading proponent of the global warming hypothesis.

C is for **COMMONS, tragedy of**

Although it is widely believed that only government action can protect the environment, in practice many environmental problems arise when resources are collectively owned. Indeed, anything owned by all might just as well be owned by none. Without private ownership there exists no effective framework of property rights, as the former communist countries discovered. The temptation is then for each individual to grab and exploit as much as he or she can before anyone else does. There is no incentive to maintain and preserve the common resource. Even on the small scale of housing estates, it is the common areas which are abused and where litter and graffiti abound.

Air, water and most kinds of wild life have no private owners. They have no form of effective protection. This can best be seen in the case of animals; these are killed to the point of extinction when no individual has a direct financial interest in their preservation, and where there are no personal property rights in

the offspring of the present animals. There is no shortage of cattle which are privately owned, but there is a shortage of certain whales and fish which are not. Just as the common land in medieval England suffered from over-grazing, so does the rainforest suffer depletion. Where no-one own it, no-one protects it.

The *tragedy of the commons* explains why socialist economies have generated more pollution than capitalist ones; under socialism no individual had to pick up the tab for the wasteful use of resources. The way to ensure that the relevant resource is cherished is by having it privately owned. Where individuals stand to lose value, they will protect and conserve the asset in order to enjoy its use in the future, both for themselves and their children.

D is for **DDT**

The environmental movement waged a ferocious campaign against the pesticide DDT, which resulted in it being banned in the USA. Their campaign was based on three main claims; that DDT caused the death of many birds and could lead to the extinction of some bird populations; that DDT was so stable it could never be eliminated from the environment: and that DDT might cause cancer in humans. The claim was made that DDT caused birds to lay eggs with thin shells, that once in the food chain, DDT was not eliminated, but passed on to other species including humans, and that tests on rats indicated cancer-causing potential for human populations.

Factual evidence has cast serious doubt on all of these claims. Actual counts have shown that many bird populations were in fact growing during the period when DDT was used most extensively. Scientific studies have shown that DDT breaks down rapidly in the natural environment. There is no evidence linking DDT to cancer in humans.

On the plus side, DDT, soon after it first became available, proved a totally effective method of controlling typhoid, and saved millions of lives from the ravages of malaria. It is generally accepted that DDT would have virtually eradicated malaria, if the pesticide had not been prohibited. A valuable and useful substance was banned due to the ill informed rhetoric of a small number of unrepresentative activists. Ironically the pesticides with which DDT has been replaced have many more potential risks. In retrospect, it would have made more sense to use DDT in a sensible and controlled way, gaining the benefits without exposing humanity to any risks which might be engendered by excessive and indiscriminate use.

D is for **DISPOSABLE NAPPIES**

There is a widespread tendency to assume that disposable is always bad and recyclable is always good. No doubt this is the reason that some states in the USA have banned disposable nappies, and others are threatening to do so. Environmentalists have made a big issue of disposable nappies. They have claimed that used ones are clogging our landfill sites, and that they provide a classic example of conspicuous and wasteful consumption, all to avoid a little effort spent in washing. Manufacturers such as Johnson and Johnson have been targeted as enemies of the environment.

Scientific studies show, however, that when all environmental factors are considered, cloth nappies are almost certainly more environmentally harmful than disposable ones. The washing of cloth nappies consumes a great deal of water and energy, and also puts chemicals used in washing powder into the environment. In areas such as California, where water is relatively scarce and landfills are plentiful, the case for using disposable nappies is particularly strong.

The claim by environmentalists that disposable nappies are hogging space in landfills has been answered by researchers who have investigated landfills to find out more about the social behaviour of modern Americans. Here they discovered that disposable nappies account for only a fraction of 1% of the contents of landfills. In some landfills, however, telephone books made up over 50% of the total. So on the one side is a relatively inert product which takes up negligible landfill space. On the other is a product which consumes vast quantities of water and energy, which entails the burning of fossil fuels, and which leaches detergents and bleaches into the environment. Many observers would suppose the former product to be more environmentally sensitive, and would suppose the campaign against it to have more to do with raising "environmental consciousness" than with actually improving the environment.

E is for **EHRLICH**

Stanford University biologist Paul Ehrlich - a bona fide expert on butterflies - has been arguably the most influential eco-doomster, having written many international best sellers on the subject. An article of his in Playboy magazine "inspired" the formation of the Peoples' Party in Britain, which became the Ecology Party, which in turn became the Green Party.

Ehrlich has consistently been arguing that gloom and doom are around the corner, and has equally consistently been wrong. In his first best-selling book "The Population Bomb" (published in 1968) Ehrlich predicted that "the battle to feed humanity is over. In the 1970s, the world will undergo famines. Hundreds of millions of people are going to starve to death in spite of any cash programs embarked upon now. Population control is the only answer."

When the world was still plodding along nicely at the end of the 1970s Ehrlich predicted that global famine would occur in 1985. Now he is predicting that the US population will fall from 250 million to 22.5 million before 1999 due to famine caused by global warming.

Ehrlich has also long been forecasting the rapid depletion of natural resources, such as coal and oil. The effect of this would obviously be substantial and result in rapid increases in their price. Julian Simon - a Professor of Economics at the University of Illinois who has long been arguing that natural resources are becoming less scarce due to constantly improving technology, and that their price will therefore fall unless the markets are interfered with - challenged Ehrlich to a bet on the future price of natural resources. Ehrlich accepted.

The terms of the bet agreed upon by Simon and Ehrlich were to take a fixed basket of five natural resources worth $1000 in total as per November 1980. If in real terms these resources were worth more by November 1990 Simon would have to pay Ehrlich the difference in value; if they were worth less in real terms Ehrlich would have to pay Simon the difference. By November 1990 the real value of these resources, to the nearest dollar, had fallen to $424; Simon received a cheque for $576.

Considering his record, it may not come as a surprise that Ehrlich was reported in July 1992 to be calling on journalists to self-censor evidence which did not contribute to the environmental panic.

E is for **ELEPHANTS**

Between 1981 and 1989 the African elephant population fell from 1,200,000 to 600,000. This is the factual basis for the extrapolation that these creatures will be extinct by 2010. This decline in elephant populations has not, however, been uniform throughout

Africa. While in Kenya the number of elephants fell from 65,000 in 1979 to 19,000 in 1989, in Zimbabwe the numbers have actually risen from 30,000 to 43,000 over the same period. In Botswana there has been an even more spectacular rise in the same period from 20,000 to 51,000. These differences seem to be largely due to divergent conservation policies.

In Kenya there is a blanket ban on the hunting of elephants and the trade in ivory. The rural population has not been extensively involved in the conservation effort. Tourism in Kenya mainly generates income for urban dwellers - even most of the tour guides come from the cities. The growing rural population does not get any legitimate benefit from the presence of elephant; in fact elephants compete with man for scarce resources. They trample fences and destroy crops.

Poaching, however, brings huge rewards by African standards, especially since the trade in ivory has been banned. Uncarved tusks brought $2.50 a pound in 1969, $34 a pound in 1978 and over $90 a pound today. Since an average elephant's tusks weigh 22 pounds, the value of each elephant's ivory is $2000. On top of this the elephant's hide - which is made into boots, wallets, and other leather goods - is worth at least the same. With rewards such as these, and with the local population gaining nothing from the preservation of elephant herds, it is not surprising that poaching has reduced the Kenyan elephant population to such an extent.

In Botswana and Zimbabwe, on the other hand, the hunting of elephant and the sale of ivory is permitted on a strictly limited and controlled basis. The right to shoot elephants is sold, mainly to rich Americans and Europeans, at a rate of $7500 each. The price of an average hunt in Zimbabwe is $25,000. The local communities are given a share of the hunting permits, which they can resell if they so wish. It is obviously in these communities' interest to ensure that the animals are not poached. The nature reserves are also well protected, spending more than $600 per square mile for this purpose; local people are employed as guards. The elephant population is kept sufficiently high to guarantee future supply.

When elephants are treated as livestock - albeit precious ones - they thrive. When they can not be legally traded their fate is sealed. Ironically recent attempts to ban trade in ivory on an international level could well endanger the long term survival of the elephant. If we seriously wish to give the elephant population a chance of survival, we should place it in the economic framework, as happened in Zimbabwe and Botswana. This gives it value, and makes it worth preserving. Where that value accrues to local inhabitants, it makes the elephant habitat worth preserving as well. Environmentalists might not like the thought of hunting elephants and the commercial use of elephant products, but they should ask themselves whether they want real results, or just the self-indulgence of a purely sentimental approach.

E is for **EMISSION STANDARDS**

Emission standards are having an increasingly important impact on industry. Even the populace at large is being effected by them, owing to car exhaust standards and restrictions on domestic chimneys.

Some free marketeers have suggested that emission standards are unnecessary. They argue that a property rights-based solution would be more effective. Under this system the polluter would have to recompense a landowner for any unwanted waste deposited on the latter's property. The source of the pollution could be discovered by having different manufacturers put specific tracers into their emissions. This would be in the manufacturer's own interest so they could not be made liable for pollution caused by another. It would also encourage manufacturers to invest more in reducing their own pollution as they would benefit from this directly. With oil spills, chemical effluents and gaseous emissions, it is possible to identify the source of the output using modern sensory technology. A property rights-based approach such as this could be enforced through the civil courts. Society might well decide to go down this route in the future.

For the present, however, where there is a system of pollution control based on emission standards there are two basic approaches, one of which is very much superior to the other.

The most widely used system is a *process-driven* one. Here the state tells the producer exactly which technology to use. This will not necessarily lead to the adoption of the best possible methods. Even if the government prescribed technology is the best available at the time, better methods in most instances will soon supersede it. When the new technology comes along, the state regulation will probably remain unchanged, imposing an expensive and inefficient system on industry. The imposition of a fixed system also discourages research into alternatives which might be more effective. These improvements will, in all likelihood, not be commercially exploitable because of the regulatory mandate for the old technology. Furthermore the process imposed by government is often chosen not for its effectiveness, but because of the strength of interest group pressure. It is very tempting for government to pick a system which it feels would save jobs in a specific area regardless of its relative merits.

A *result-driven* policy suffers from none of these problems. Here the state simply sets limits on permitted emissions. How the producers ensure that these targets are complied with is up to themselves. This approach encourages innovation as each producer seeks the most cost effective and efficient way of reducing pollution. Where tried, this method has proved very successful.

A clear example of the failings of a process-driven policy has occurred with US car exhaust standards. More and more expensive standards are being imposed on the manufacturers of new cars, while in fact roadside tests have shown that more than half the pollution comes from 10% of cars, many of which are old. Most of these cars could easily be retuned without great cost. This is

precisely what would happen with a results-driven approach. Alas, Europe, too, seems locked into the process-driven approach. Catalytic converters are specified, where the real aim is to limit the emission of toxic gases. Thus unknown technologies are aborted. Relating controls to results might provide a cheap and effective solution here, as it could elsewhere.

F is for **FISHING**

The sea is a common to which all have access. Within territorial waters the access of foreign vessels is usually restricted, but all domestic vessels will still normally have common access. This results in over fishing in many areas. No individual fisherman has any incentive to preserve stocks of this unpriced resource because they would otherwise be taken by someone else. The stocks of certain types of fish have been seriously depleted as a result.

A solution often proposed for this problem is to restrict the number of days and the times of fishing. In the US where this system was tried, all that happened was that fishermen invested in bigger boats, more efficient nets and sonar systems. The consequence was that fish stocks were being depleted yet more rapidly. The European Community's Common Fisheries Policy suffers from many of the same problems. The problem with international restrictive agreements is that it is in everyone's interest to break them personally, while having them enforced for everyone else. Thus the law-abiding and the rule-respecting suffer most, and can only complain about the outlaws who do not.

Privatized aquaculture can solve this problem. It has been shown to work in Japan, Australia and New Zealand. In each case the government decrees the total allowable catch. Individual tradable quotas are sold and often resold. The individual fishermen can then catch as much as they have bought quotas for. It is in their interest, moreover, to protect the stocks and the future of this now valuable private resource. Conservation becomes common sense, instead of an arbitrary rule imposed from outside. The way to conserve fishing stocks lies in providing incentives for fishermen to operate below the limit of resource renewal. The purchase of tradable quotas provides just such an incentive.

G is for **GLOBAL WARMING**

In recent years the lead role in the environmental doomsday scenario has been assigned to global warming. The case usually put is that human activity is generating ever greater amounts of greenhouse gasses, principally carbon dioxide; that these are building up in the atmosphere; that this has the effect of retaining the sun's heat, which in turn leads to a rise in global temperature. It is alleged that this will result in coastal floods, desertification, droughts, devastated agriculture and super hurricanes, alarmingly called hypercanes.

Recorded temperatures, however, reveal no significant overall warming in the last 100 years. During the 1880s there was a period of cooling, followed by a warming trend. The temperature rose by one degree Fahrenheit between 1900 and 1940, then fell from 1940 to 1965, and then began to rise again, increasing by about 0.3 degrees Fahrenheit since 1975. These trends seem to have had little overall impact on global climate. They are far from the relentless increase in temperature that the environmental movement would have us believe. Indeed when the heat impact of growing cities is taken into account it can be argued that there has been a slight global cooling over the last 100 years. More recent satellite measurements also seem to confirm that there has been no significant change in climate since new measurement methods came into use.

Even if global warming were occurring, the notion that this is caused by human activity is dubious. CO2 levels were 5 to 10 times higher than at present when dinosaurs roamed the earth and humanity was yet to come. Human activity accounts for only 3.5% of the Carbon Dioxide, the major "greenhouse gas", produced annually. Termites, producing 50 million tons of CO2 and methane per year, are a much more significant source. Other sources include volcanoes, the waste gases of living creatures, notably cattle, decaying vegetation and forest and grass fires. A large part of the 3.5% of CO2 which is produced by human activity is accounted for by rice production, not the dark satanic mills of popular imagination.

If global warming were occurring it would not necessarily be a bad thing. It is generally assumed that a doubling of CO2 levels would result in a 4% increase in global temperature. Recent research, however, suggests that such a rise in temperature would, far from causing massive drought, actually cause a vegetation growth of 26%.

The climate is affected by many present factors which are not yet fully understood. The evidence suggests that anxiety over global warming, just like the earlier concern over an imminent ice age, is unfounded. Even if global warming were definitely proved, it could not be wholly or even principally attributed to human activity. The environmental movement seems to be bouncing governments into costly and bureaucratic policies which lack scientific justification.

H is for **HAZARDOUS CHEMICALS**

Fear of chemicals is very widespread. Ironically chemophobia has grown as society has become more technologically advanced. The public at large will often read in the press about the dangers of preservatives, fertilisers and dioxins, for example. Such reports become particularly worrying when linked to the harm these chemicals allegedly do to children. It is quite understandable that members of the public then want "something done" about the perceived risk. Politicians will often respond to this by introducing new regulations.

What the public do not realise is that most of the spine-chilling stories they read about are without a scientific basis. Alarmist news is more exciting than a balanced discussion of the merits and demerits of a particular chemical. What the public is regaled with is often a mixture of hyperbole, conjecture and misrepresentation. For example Rachel Carson's 1962 book "Silent Spring" - which really launched the public animus against chemicals - is appallingly bad science according to the experts. The vast majority of the public, with a non-existent or insufficient scientific education, has no way of knowing what is accurate and what is junk science. Chemical hazard crazes come in cycles. Sometimes it is pesticides, sometimes industrial chemicals, sometimes food additives. This sort of reporting has led to much unnecessary state action, and deprived us of the benefits which some chemicals could provide.

Tragically, bans on some chemicals have sometimes had very detrimental effects. The outlawing of DDT is a case in point. Even where there is very little substantiated evidence on the possible impact a chemical may have on a tiny proportion of those who come into contact with it, this has been enough in the USA to cause that chemical to be banned, despite the benefits it brought to millions. Cyclamates were proscribed as artificial sweeteners because of a minute risk they posed to the health of rats forced to ingest huge quantities of them. The humans who suffered health problems with sugar, or those brought on by obesity, were not counted.

The state actually has a very poor record on protecting the public from chemical hazards compared to that of private corporations. This is understandable, because private firms are eager to avoid the financial losses of costly damage suits against them. Government often puts obstacles in the way of suing it, and even if it is sued successfully, no individual will pick up the bill.

Chemical hazards have been much exaggerated. Where they do exist the problems can usually be solved more easily through civil litigation than through government regulation. When there is a case for regulation, it should be fully costed, and should always take account of the gains brought about by some chemicals, to be balanced against any threat they might pose.

I is for **ICE AGE**

While many environmentalists are predicting imminent Armageddon because of global warming today, it is salutary to remember that just 15 years ago many of the same individuals were issuing warnings of comparable calamity because of global cooling.

Prophets of a new ice age could not, however, agree on why this was going to happen. Some claimed that increasing amounts of particulate matter in the atmosphere, from volcanic ash to man-made pollutants, reflected sunlight and thus heat from the earth. Others insisted that the earth experienced long-term climatic cycles, caused by irregularities in the earth's orbit. The latter backed up their case by arguing that ice ages usually lasted for 100,000 years and were followed by warm periods of about 10,000 years. We are about 13,000 years into the present (inter-glacial) warm period, so statistically, they say, an ice age is overdue.

They also disagreed on how long it would take for the ice age to set in. Some suggested this would take centuries; others that a "snow blitz" would occur within just a few decades.

What the doom-mongers were agreed upon was the catastrophic impact of global cooling. In the words of Lowell Ponte in "The Cooling", his best-selling and influential 1976 book, "The cooling has already killed thousands of people in poor nations. It has already made fuel and food more precious, thus increasing the price of everything we buy. If it continues, and no strong measures are taken to deal with it, the cooling will cause world famine, world chaos, and probably world war, and this could all come by the year 2000." The deliberate emission of what are now termed "greenhouse gasses" was proposed to counter the big freeze.

The global climate system is very complex, and is not properly understood yet. The media, however, prefer simple headlines. As J. Murray Mitchell, a prominent climatologist, noted "The media are having a lot of fun with this situation. Whenever there is a cold wave, they seek out a proponent of the ice-age-is-coming-school and put his theories on page one; whenever there is a heat wave they turn to his opposite number who predicts a kind of heat death on earth."

for **JAFFA ORANGES**

It would be natural to assume that the most environmentally friendly packaging for Jaffa oranges would be their own peel. This is not in fact the case.

From the same amount of oranges a domestic consumer will obtain 25% less juice than an industrial producer, due to the greater efficiency of commercial orange presses. This means that if the consumer buys fresh oranges he is not only using 25% more oranges, he is also using 25% more fertilizer, pesticides, water, fuel and other resources used in their production.

Ready squeezed orange juice also produces less waste than fresh oranges. In Mexico City - where fresh oranges are predominantly used - the average household throws out 10.5 ounces of orange peel per week. In the USA - where ready squeezed juice is predominantly used - the average household throws out 2 ounces of orange juice packaging per week.

While domestic consumers simply bin orange peel, commercial producers turn discarded orange peel into animal feed and other products. In Israel orange peel is turned into an effective fertilizer; in Brazil it is turned into a major source of cattle feed.

More can be transported on fewer journeys with ready squeezed orange juice; this clearly uses less energy, burns less fossil fuel and is a more efficient use of natural resources.

This does not, of course, mean that there is anything wrong with using fresh oranges for juice; one might choose to do so for reasons of taste. There are, however, no apparent environmental reasons for not using ready squeezed orange juice.

K is for **KRAKATOA**

In the Sunda Strait south of Sumatra and west of Java lies Krakatoa, an active island volcano. In 1883 it erupted with four gigantic explosions, the third of which was the most violent on earth in modern times. This explosion blew away the northern two-thirds of the island, produced waves 120 feet high, and caused 36,000 deaths. It was even heard at Rodriguez Island near Mauritius 4,800 miles away.

This explosion discharged far more sulphur, chlorine and other chemicals into the atmosphere in a single instant, than would be caused by decades of human activity. According to the environmental movement's predictions of the impact of relatively insignificant human activities on the environment, one would have expected that something on the prodigious scale of Krakatoa would have spelt instant universal doomsday. What did in fact happen?

The side effects of Krakatoa included a few chilly winters, spectacular sunsets, and a temporary drop of 0.3% in global temperature. There was no long term climate change. Other volcanoes in modern times, such as Mount St Helens in Alaska and Mount Pinatubo in the Philippines, have similarly produced sulphur and other chemical pollution on a scale which dwarfs man's activities. Yet despite dramatic sunsets, there have been no "nuclear" winters and no mass extinctions. The experience of these natural events seems to suggest that the environmentalists are putting out scare stories not borne out by events.

LOVE CANAL

The Love canal is a toxic waste site in upstate New York. It is often cited as a classic example of corporate greed and environmental irresponsibility, illustrating the need for government intervention. The reality is different.

In 1953 the Niagara Schools Board bought a toxic waste site off the Hooker Chemical Company. This site had been lined with clay. The Hooker Company had specifically warned of the dangers of meddling with it. All to no avail, as the city authorities soon put water pipes through the clay. Chemicals started seeping into the surrounding soil. This would never have occurred were it not for bungling by the city authorities.

The Environmental Protection Agency made a rapid, and as it turned out inaccurate, assessment of the potential dangers. Fears were raised that the chemicals leaked could potentially cause cancer. As a result houses in the area were condemned and compulsorily purchased; the whole community was destroyed.

To date there has been no evidence that the chemical leak has caused a single instance of cancer. Recently two-thirds of the affected area has been declared habitable again by the New York Department of Health.

The corporate interests involved behaved impeccably throughout. The genuine problems which did arise - albeit very much exaggerated in much of the media and by the environmental movement - were all caused by the public bodies involved. Yet the lessons drawn from this were that *more* state action was needed in relation to waste sites. Thus the Superfund was born. This has brought massive costs, and very few results, except to make a lot of lawyers a lot of money.

M is for **MARKET ENVIRONMENTALISM**

Not all environmentalists go along with the radical greens' repudiation of industrialization, modern technology and free enterprise, or with their attachment to authoritarian regulation. An increasing number of environmentalists are in favour of progress, bearing in mind that innovation has consistently led to a cleaner and safer environment. This new generation thinks that the best way of protecting the environment is through a free market and property rights based approach.

The validity of this approach is supported by the following:

- states with free market economies have used energy and raw materials far more efficiently, and conserved them far better, than those with planned economies. They have also been far less polluting - the evidence shows that the more advanced the market economy the less it pollutes for each unit of production.

- practical examples clearly back up the notion that property rights and free markets are a far better way of protecting the environment than government regulation and state intervention.

Market environmentalism harnesses incentives to motivate people. It is all very well to urge people to do things which appear to go against their own interest. Temporary success may even be achieved. But for long term behaviour, it is better to align that which is socially beneficial with the personal interests of the individuals concerned. Thus people will protect elephants if they gain economically by doing so. They will conserve fish stocks if their prosperity depends on it. They will preserve rainforests if they gain more by doing so than by chopping them down and planting crops in their place.

Too often environmentalists make facile and sentimental appeals to the middle classes in developed nations, or capture the idealism of their children. These classes are rarely involved directly in the choices which have to be made in developing countries. Real environmental preservation is often to be achieved by garnering the support of those whose livelihood is affected, and this is best assured by capturing their economic interest. It is easy for people in rich countries to urge preservation of elephants for idealistic reasons; elephants do not trample their crops and threaten their families with starvation. Market environmentalists try to make the elephants worth *more* than the crops, so poor farmers will also want to preserve them.

It is similarly painless for people living in comfortable homes to call for all pollution to be banned. They do not have to bear the costs which this imposes on poor people struggling to produce goods cheaply enough to sell, or on those whose jobs might be threatened by a blanket ban. Market environmentalists try to make it in everyone's interest to minimize pollution. They use tradable permits, and introduce maximum permitted outputs at a rate which encourages innovative technology to find cost-effective solutions.

M is for **MONTREAL AGREEMENT**

In September 1987, 24 states in addition to the European Community signed a protocol in Montreal pledging to reduce their production of CFCs, or chlorofluorocarbons, by 50% from their 1986 levels by 1999, and ultimately to phase out their production altogether. The reason for doing this was the belief that CFCs might be responsible for creating a hole in the ozone layer. The case for this belief is unproven, however, and such evidence as there is indicates that if CFCs do play a part, it is a small one.

Following as it did a huge amount of ill-informed speculation about the dangers facing us all because of the "ozone hole," the Montreal Protocol was hailed by most of the press and other commentators as a victory for common sense and international goodwill over corporate interests.

The reality, however, was more complex. American CFC producers were suffering from restrictions and bans imposed upon them by state governments, and lived in dread of a unilateral ban on CFCs by the US federal government. Worried about their sales, and already at a competitive disadvantage against their less regulated European competitors, they pressed the US government to push for world-wide multilateral restrictions on CFCs which would subject their rivals to production limits and strengthen their own market leverage.

The Montreal Protocol provides for a capping of CFC production on a country by country basis. These restrictions squeezed the foreign competitors of US producers and allowed the latter to raise their prices of CFCs by between 30% and 60%. The US CFC manufacturers were also ahead in the production of CFC substitutes, many of which they had patented. These substitutes can cost five times as much as the CFCs they replaced.

It may be that there is a case that CFCs cause damage to the ozone layer, though it is certainly less than that which is alleged, and will take more serious evidence to assess. It may even be that there is a case for persuading producers to move away from the use of CFCs and towards alternatives. The way to promote this is by economic incentives which make it in the interest of producers to accelerate the development of new technologies and the switch over to them. As it stands, however, the Montreal Protocol is a classic example of corporate lobbies cooperating with the state to create a cartel. In this they were unwittingly assisted by the hysteria of the environmental movement.

M is for **NIMBY**

The term *Nimby* - an acronym for "not in my back yard" - was popularized by the late Lord Ridley when he was Secretary of State for the Environment. He was referring to those who object to developments when these are planned in the vicinity of their own homes. Although people benefit from new roads, for example, or new shopping centres or housing estates, they are prone to raise objections if their own neighbourhood's tranquillity and beauty are threatened.

The ultimate logic of this position is that no developments, however badly needed, would be allowed anywhere; there would always be local residents to object. The issue of "nimbyism" raises an important point: that political decisions are influenced by protests, and that only those who perceive themselves to be an interest group will raise them. Thus a new school will have objections raised by nearby residents, but there will be no-one to put the case for the future parents who will benefit. The objections of those near a proposed power station will be recorded, but the voices of potential beneficiaries of cheap power in the future will be mute.

Those who gain might be unknown and unaware of their status as such, whereas those who live near the proposed development will be vociferous in their opposition, even though in the past their own homes might well have been objected to just as loudly. Often the noisiest protests come from those who built their own homes most recently. Cynics define a developer as someone who wants to put a mountain cabin in the wilderness, and a conservationist as someone who already has one.

O is for **OVERPOPULATION**

There is much concern about the world becoming overpopulated, and that the world population will soon reach an insupportable level. This will result, many argue, in world-wide impoverishment and starvation on a massive scale

The idea that population levels will soon be unsustainable has, however, been with us for a long time. There are even references to over-population in the bible. Modern fears originate from Thomas Malthus's 1803 "An Essay on the Principle of Population." This argued that while population grows geometrically, food production only rises arithmetically. This analysis is often extended from food production to production in general. It would obviously mean that increasing populations would entail falling living standards.

More recent research based on Indian experience by Ester Boserup stood Malthus on his head, showing that population growth is the crucial factor in stimulating agricultural productivity, by forcing farmers to adopt new techniques. But the most convincing refutation of the Malthus view comes from the facts. World food output *per person* has grown by at least 30-40 percent since 1950, as both US Department of Agriculture and United Nations figures clearly show.

Julian Simon argues in his book, "The Ultimate Resource", that humanity's most valuable resource is human ingenuity, and imagination. When population increases there will be more individuals with vision and ability, and this will lead to more innovations, which will often improve the standard of living for many. He argues that it is no coincidence that periods of great progress such as the Industrial Revolution have coincided with periods of rapid population growth. Simon suggests that, far from being concerned about increasing population numbers, we should welcome them as leading to greater economic well-being. A projected population which at one point may seem unsustainable will soon seem viable with the advent of new technologies. In 1802, when Java had a population of 4 million, Dutch colonial officials believed that the island could hardly sustain this population and that any further increase would be disastrous. Java now contains and sustains most of Indonesia's 125 million people.

The famines which have occurred in Africa are often blamed on over-population. If one looks more closely at each case one, realises, however, that most of the areas where famine has occurred have been in war zones and have been governed by especially brutal Marxist regimes. In Ethiopia, for example, famine occurred after the failure of a disastrous scheme to collectivise agriculture and transfer populations. It appears that the withholding of food supplies was used by government forces as a deliberate military tactic in both Ethiopia, and the Sudan. Food was also used as a weapon in Mozambique's civil war. When an area is embroiled in war the cultivation of crops is often one of the first victims. It is simply inaccurate to blame these famines entirely on overpopulation.

In the British case, many environmentalists argue that the optimum population size would be 30 million, instead of the present figure of around 56 million. Indeed it was Green Party policy at one point to seek this level.

The last time the British population was 30 million was in 1881, when Britain was less affluent than today. Even the Green movement realizes that such a drop in population would not make Britain more affluent; they support such a massive reduction in population because they regard it as "ecologically sustainable". What they mean by this is that if all modern farming methods were abandoned, modern technology were abandoned, international trade were halted, and man returned to the rural idyll of a mythical past, then a population of 30 million could be sustained. Many will find this vision profoundly unappealing.

The evidence suggests that increases in world population size may be nothing to worry about at present, especially as numbers look like stabilizing about the middle of the 21st Century. In any event, new technology and human ingenuity will more than take care of whatever population growth occurs.

O is for **OZONE HOLE**

Environmentalists claim that there is a growing hole in the ozone layer - the protective sphere of gas around the earth. They claim this hole has been caused by chlorofluorocarbons, or CFCs. These have a wide range of uses but those most often mentioned are in aerosols and refrigeration. The doom-mongers of the environmental movement claim that the "ozone hole" is letting in the sun's ultraviolet light, which can cause skin cancer, eye problems and damage plants. These claims lack the solid support of scientific fact, and are more controversial than their proponents admit.

The term itself is misleading, since what is called the "ozone hole" appears over the polar regions for only a few weeks a year. Even here it is unpredictable, fluctuating dramatically in size. In 1988, for example, the ozone hole over the Antarctic was only 15% of its predicted size. Recordings of the thickness of the ozone layer are too recent to discover long term trends, but there appears to be a natural fluctuation of about 15% in its thickness.

The ozone layer grew during the 1960s and shrank a comparable amount between 1979-86. The exact reasons for this are unknown, but many scientists reason that this is due to a natural process connected to the sun's radiation, and that the process is in long term equilibrium. Although it is widely believed that chlorine - an ingredient in CFCs - does effect ozone levels, it has not been proved that it does so in the form that it appears in CFCs.

If the chlorine in CFCs does effect the ozone layer, it should be noted that vastly more chlorine finds its way into the atmosphere from natural occurrences. Sea water spews out more chlorine into the air than CFCs do, and a single volcanic eruption can hurl

more chlorine there than all of the CFCs ever produced by human activity.

CFCs are only the latest of a long line of ozone hole alarms. Many environmentalists claimed firstly that Concorde, and then the space shuttle, would cause ozone holes. Many environmentalists call today for CFCs to be banned, as some called for supersonic travel and space flight to be restricted. It would be very expensive to replace instantly the CFCs used in refrigerators, costing $135 billion for the USA alone. To this would have to be added the cost of replacing the freon in air conditioners in cars, offices and homes. There is a huge cost involved in preventing the release of CFCs when equipment is junked at the end of its useful life. All the substitutes have problems; many are toxic, some are flammable. And they are all very expensive.

The environmental lobby seems determined, here as elsewhere, to commit us to vast expenditures on projects of doubtful worth, long before the scientific evidence to support their claims has been established. They give the impression, as they do in the case of "global warming," that they are more interested in having mankind make symbolic sacrifices of technology, than they are in determining the true facts of what may turn out to be a natural or cyclical phenomenon. At the heart of the protests can sometimes be found a neo-Puritanism which would like mankind to turn the clock back on refrigerators and air-conditioning, and learn to live "more simple and natural lives."

P is for **PACKAGING**

The fact that so many goods in the rich countries of the West come pre-packaged has come in for much criticism. It is often argued that packaging is wasteful, and even immoral when there is still mass poverty in parts of the world. For some, packaging epitomises the "throw-away culture of Western consumerism." If only we could return to the days before packaging, mass production and food processing, they argue, we would all be much healthier and happier.

In fact packaging plays an important role in preventing waste. This can best be seen by comparing the household waste disposed of in the USA and in Mexico. Packaging represents between 30% and 40%, depending on exactly where, of solid household waste in the USA, but only 20% in Mexico. Yet the average Mexican household throws away three times more food debris than the average US household. As a result, the average Mexican household throws away 40% more refuse in total than the average US household, an amount equal to 1.6 pounds per household per day. The amount of food debris thrown away in Mexico per household per day has been estimated as being equal to more than half the daily nutritional needs of an adult.

Mexico's greater amount of solid waste is directly related to its lack of packaging. In the USA when food is processed and packaged the unused parts are often used as fuel, animal feed or some other economically useful by-product. Commercial processing can also often extract far more than the domestic user can.

Packaged goods tend to weigh less and have a more convenient shape than the unprocessed good would. This makes transportation easier, thus reducing the amount of fossil fuels used in transit.

Another reason why food packaging reduces waste is that it reduces spoilage. In general, as the use of packaging material increases, the proportion of food waste decreases. Modern methods of packaging are especially adept at preserving produce. This has the added advantage of reducing the likelihood of food poisoning. It should be remembered that food poisoning is still a major cause of death where modern methods of food processing and preservation are not available.

Packaging, therefore, far from being wasteful, actually reduces the amount of waste produced in the vast majority of cases. It is also convenient, reduces the likelihood of food poisoning, and cuts transport costs.

P is for **PESTICIDES**

Pesticides and other chemical aids to farming are seen by many as a major threat to health. Many prominent individuals, including the Prince of Wales, have been attacking modern farming methods and advocating a return to "traditional" organic farming. This

attitude is often combined with a rejection of what is seen as the brash soul-destroying nature of modernity, and a yearning for the simple life uncomplicated by science, technology, or indeed civilization.

Those who have these views of the past do not seem to realize that the golden age they are harking back to never existed. The past may look rosy from the drawing room of a grand country house; decidedly less so when viewed through the eyes of farm labourers who lived lives of degrading toil and poverty and usually died early from disease or malnutrition.

Pesticides and other chemical aids to farming have meant that far more can be produced by far fewer people with far less effort. In the 1920s an acre of land with good soil could produce 75 hundred-pound sacks of potatoes. By 1950 this had gone up to 165 hundred-pound sacks per acre. Today it is 275 hundred-pound sacks of potatoes per acre. All this is produced by only a fraction of those involved in farming 70 years ago.

Modern pesticides also mean that crop failures on any substantial scale are far more rare than they were in the past. There will never, hopefully, be a repeat of anything like the famine which struck the Emerald Isle, where a third of the Irish population died and another third emigrated, because of the infamous potato blight.

Pesticides and other modern agricultural methods have caused food costs in the USA to fall dramatically over the course of the century, and especially since World War II. This figure would be even higher if it were not for the market controls imposed on farming.

Much of the fear of pesticides is caused by ill-informed conjecture. It is, however, interesting to note that sales of organic fruit and vegetables have fallen back to such an extent that major supermarkets are considering discontinuing the sale of them. This variety of environmentalism seems to have been, like so many of the other strains, a passing fancy. Pesticides and modern agriculture have massively improved the living standards of the population at large, especially of the rural population, and especially for the poor.

Of course we should not be indifferent about the amount of chemicals used. Other things being equal, it is better to use less rather than more, for a given output. This means encouraging technology which uses pesticides more efficiently. We should provide incentives for the use of organic pesticides, including ones genetically engineered for specific and limited tasks. We should vary our pesticides and use them intelligently so that we do not encourage resistant strains of pest to develop in response. All of this points to the sensible use of pesticides, not to blanket bans imposed after ill-informed and hysterical campaigns and media scares.

Q is for **QUALITY OF LIFE**

There can be no disputing the improvement in the material standards of life of the average person brought about by the free market system in modern times, whether it be measured by longevity, diet, health, comfort, hours of work, or the physical demands that life makes. Yet there are some anti-growth environmentalists who argue that material progress has been bought at too high a price in terms of quality of life.

Such critics seem to have little notion of the squalor and misery of the mass of mankind in earlier times, and the demoralizing effects of poverty and under-nourishment. Nor do they take proper account of the liberating effects of modern gadgets like washing machines on the lives of working class women, lives which were formerly so full of drudgery and unremitting toil.

In their typical hatred of the motor car as the destroyer of community spirit and civilized living in the mindless quest for speed, they overlook the car's role as liberator, and the wholesale widening of opportunities which it has brought for travel and the enrichment of many people's lives.

Of course, there is a long and worthy intellectual tradition, harking back to the Romantic movement in literature and art, which seeks to restore and preserve the values and the social stability of the old rural culture. But a programme of deprivation and impoverishment, apart from being unsaleable to a democratic electorate, is hardly calculated to inspire a moral renaissance or devotion to the environment. Experience clearly indicates that material betterment improves the prospects of civilized behaviour and respect for the environment. After all, books, pictures, music, clean air and water, and a smiling countryside all come at a cost.

R is for **RAINFORESTS**

The destruction of South American rainforests has been a major talking point for many years, and has gained much media attention. "Exploitative western capitalism" has been blamed for this by some environmentalists, and many have seen the international timber trade as the villain of the piece. The facts, however, point in a different direction.

South American governments are effectively subsidizing the logging of virgin rainforest in order for the land to be transformed into agricultural ranches. In Brazil, for example, agriculture is taxed much more leniently than other types of businesses and land tax is charged on virgin forest, but reduced by up to 90% on agricultural land. On top of this up to 75% of the cost of transforming forest into ranches can be recouped in tax credits. The World Bank has estimated that these subsidies amounted to $1 billion between 1975 and 1986. If it were not for these subsidies it would be far less attractive to turn rainforest into farmland.

Foreign aid on occasions has also funded projects which have contributed to the destruction of rainforest. An example of this was the IMF's "Polonoroesta Plan." This aimed at turning 100,000 square miles of Brazilian rainforest into farm land. Government action has thus often contributed to the destruction of rainforests, not their salvation.

In most cases the loggers are paying nothing for the trees they are felling, as there is no properly documented ownership of large areas of the land and much of the rest is state owned. This is a classic example of the "tragedy of the commons." Because there is no defined private ownership no one is interested in the long term maintenance of resources. If the rainforests were privately owned it would be in the interest of the owners to harvest only enough to assure future supplies of timber. With private ownership loggers would actually have an interest in preserving the rainforests.

Far from the pursuit of wealth being the destroyer of natural resources, in many instances it is the *lack* of private ownership of wealth that has created the problem. It is this, combined with government subsidy, that has accelerated the destruction of South American rainforests.

It ill behoves those in the advanced world, who enriched themselves by transforming their habitat, to criticize poorer countries which try to do the same. They are only doing with their rainforest what we did with ours. To them any restrictions look like a form of economic exploitation in which the rich countries pull up the ladder once they have climbed it. The third world countries claim that if we stand to gain by the preservation of the rainforest, then we should be prepared to pay for that benefit. The very least we should do is to cease subsidizing its destruction.

R is for **RECYCLING**

Recycling may in some cases be an environmentally friendly and economically efficient way of dealing with refuse. It is not always so. The case has been made convincingly for aluminium, where the recycled material uses only 10% of the energy which it takes to produce aluminium from its bauxite ore. In the United States over half of all aluminium can are currently recycled.

It is less well known that about 80 million tons of iron and steel are recycled each year, and that the extensive recycling of these materials took place long before environmentalism came into vogue, and did so for economic reasons. Most glass containers in the USA contain at least a quarter of recycled glass, and nearly a quarter of all plastic drink containers are recycled into other products. About 30% of paper is recycled.

It is doubtful if recycling paper helps the environment. While it is true that a ton of newsprint takes 17 trees, they are trees grown for the purpose which would not otherwise be grown at all. Nearly all paper comes from "farmed" trees grown in response to the need for it. No trees are saved by recycling paper. Furthermore, while trees absorb carbon dioxide, they do it most at the growing stage. Young trees are more efficient absorbers of CO2 than mature ones. The harvesting and replanting done for the paper industry guarantees a constant supply of growing trees.

The production of recycled paper also requires the use of chemicals to remove ink, and bleaches to lighten, both of which leach into the environment. Even the collection and transport of bulky waste paper requires the use of fuel to get it to reprocessing plants which might be hundreds of miles away.

The same is true of garbage in general. The use of energy in its collection, transport and processing might be higher than the energy saving sought by recycling. The argument is used that recycling is necessary to avoid running out of landfill sites, but again, the case is not proved. The rectangular, foil-lined juice boxes used for children's drinks have been banned in the state of Maine, even though they make up two-hundredths of one percent of US landfills. Similar state action across the US covers other products, including disposable nappies, even though they take up a negligible percentage of landfill space.

There is not a shortage of landfill sites in the advanced economies. What we do have is a campaign of hostility and hysteria against landfill sites. In fact the new landfills are among the safest way of disposing of garbage. Because they are sealed there is virtually no degradation, and no leaching of toxins into the environment. The same cannot be said of many of the other methods of disposal and recycling.

S is for **Smoking**

Now that environmentalism has become, as Professor Kenneth Minogue of the LSE has pointed out, one of the principal "post-socialist" masks for contemporary hostility to free markets and individual liberty, it is not surprising to see it dragged out in attacks on anything else deemed "politically incorrect".

Smoking is a case in point. Anti-smoking paternalists and authoritarians increasingly draw on environmentalist rhetoric, claiming for example that the tobacco industry "wastes" resources, or plays a large role in deforestation. The first claim is nothing but an assertion of subjective taste. Any use of resources disapproved of by one person can be labelled "waste". This is not a claim about reality, merely an expression of dislike.

The second claim is simply untrue. Only 15% of the free world's tobacco is fire-cured by wood fuel, and less than 1% of its consumption of wood is due to tobacco. (In fact, domestic cooking accounts for 99% of annual wood burning). Moreover, wood used for such purposes does not mean irrevocable deforestation. Wherever there is anything resembling a free market and proper allocation of property rights, resources like forests are constantly renewed.

Private enterprise tobacco companies, the despised "multinationals", out of rational self-interest have progressive resource regeneration policies and educate and encourage peasant farmers in rational farming policies. In Kenya, for example, all tobacco-related wood growth is self-replacing, and far from deforestation occurring, tobacco planting has led to an increase in forested areas.

It is also sometimes argued that tobacco planting results in land not being used for crops and in soil erosion. However, it is absurd to claim that all land should be used for food production. People value the pleasure of tobacco, and just because some people disapprove of that pleasure, or consider it dangerous, there is no good reason why consumer demand should be interfered with. Moreover, only 0.3% of the world's arable land and permanent crop areas are used for tobacco cultivation - and then only for 3 to 6 months per year.

Tobacco cultivation does not replace food production, but usually rotates with it. Moreover, many tobacco soils are unsuitable for other crops. Tobacco farming is, and continues to be, a valuable activity for third world countries. With the assistance of multinationals and their educational activities regarding modern farming techniques, it has helped sustain many small-scale and family based farms. Tobacco prices have remained relatively stable and high in comparison with other commodity prices (such as tea, rice , rubber, cotton, and coffee). In Malawi and Zimbabwe tobacco constituted 56% and 47% of their respective agricultural earnings, and earns the developing world as a whole $31.7 billion annually. Tobacco makes good environmental and economic sense.

The other major claim made by anti-smokers is that smoking "pollutes the atmosphere" and that non-smokers have a right to "clean air". This is another hysterical over-statement. Measurements by independent researchers in 3,000 public places in the UK (including travel, work, leisure and domestic locations), showed that in three-quarters of such locations nicotine levels were too low to be detected. It is true that in certain places, like bars or pubs, the level of smoke might be obnoxious to some. But this is entirely the affair of the owner of the premises, who can rightly make whatever rules he or she sees fit to satisfy either themselves or their customers and guests. The market will respond to consumer demand by smokers and non-smokers alike. Non or anti-smokers have no right to interfere in the legitimate decision-making sphere of property owners and entrepreneurs.

The anti-smokers have recently waged a highly effective propaganda campaign alleging that ambient tobacco smoke, so-called "passive smoking", is a threat to the health of the non-smoker. This is a classic case of "junk science" and the "big lie", in which a number of shoddy and methodologically unsound studies are hyped up, negative findings are ignored, and statistics are "massaged" to produce the desired scare campaign. Thus, out of the 30 studies on lung cancer and passive smoking, 6 (2 of which have been discredited) reported a statistically significant risk association, and 24 reported no statistically harmful effect.

Two of those 24 in fact reported apparently beneficial effects. (This is not as unlikely as it sounds, due to the biological principle of hormesis, which can also be found at work in the effects of low level exposure to radiation). Whatever is claimed by highly partisan, so-called "official" and government reports, "passive smoking" is not a proven threat to the non-smoker - and might even be good for them in some cases.

S is for **SUPPRESSION OF DATA**

In recent years a worrying trend has emerged in which some environmentalists call for the suppression of data which contradicts their theories.

Stephen Schneider is the Director of the National Centre for Atmospheric Research, which has been a leading forecaster of global warming. Interestingly enough Schneider had been saying that a new ice age was on its way in the 1970s, but changed his mind in the 1980s to claim that the earth would soon be suffering from overheating and drought. Schneider was recently recorded as saying, "We have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we may have. Each of us has to decide what the right balance is between being effective and being honest."

The Washington Post is the paper which more than any other in the USA has contributed to popular concern over various alleged environmental and health threats. Its editor, Ben Bradlee, was recently recorded as saying at a Smithsonian Institute symposium

hell with the news. I'm no longer interested in news. I'm interested in causes. We don't print the truth. We don't pretend to print the truth. We print what people tell us."

This attitude goes to the highest level. In July 1992, Vice-President Al Gore (then still a Senator) was recorded as calling on journalists to self-censor material which undermines "the effort to build a solid base of public support for the difficult actions we must soon take."

The worthiness of a cause does not justify lying. If the evidence conflicts with the theory, it is the theory which must yield, not the evidence. Closing our eyes to what is there does not make it go away. What environmentalism needs most urgently is *more* evidence and more research. We need to know what truth there is, if any, in some of the claims being made. Far from the suppressing of evidence as some are advocating, we need to publish more of it.

T is for **THREE MILE ISLAND**

Three Mile Island was the scene of the worst accident in the history of the US nuclear industry. This incident has always been held up by the anti-nuclear lobby as an example of the dangers of nuclear power.

In fact Three Mile Island proved the effectiveness of the safety arrangements in Western nuclear power plants. Although radioactivity escaped from the reactor the vast majority of it was trapped within the containment building. The population around the plant received on average an extra 1.2 millirems of radiation. This is about the same amount of radiation as one would receive from watching colour TV for a couple of hours a day over a year. To put this in perspective, in the US the average annual natural background radiation received is between 300 and 350 millirems, although it can be as high as 600 millirems.

Research seems generally agreed that it takes exposures in excess of 100,000 millirems for there to be a discernible effect, and that cancer will arise in half of the cases at exposures of 400,000 millirems.

The radioactivity released at Three Mile Island may not have harmed anyone. The design fault which caused the accident has been ascertained and the necessary changes have been made to similar reactors. Safety standards have also been further improved since. Three Mile Island is, therefore, nothing like the damning indictment of nuclear power the environmental movement try to make out.

The insistence of the environmental lobby in targeting nuclear power sometimes obscures the fact that coal and oil burning cause thousands of deaths per year in respiratory diseases. Coal mining kills by accident as well as disease. Hydro-electric power claims hundreds of victims a year as bursting dams wash away villages. Seen in this context, nuclear power has a better safety record than most, and as disasters go, Three Mile Island was not even in the same league.

T is for **TURTLES**

The importation of all sea turtle products into the USA was banned in 1978. This still applies to both farmed and wild animals. The evidence, however, suggests that the ban on the trade of farmed sea turtle products has been counter-productive.

In 1968 the late Sir Antony Fisher - the founder of the Institute of Economic Affairs - set up the Cayman Turtle Farm in the Cayman Islands, British West Indies. This farm was set up to breed sea turtles in captivity. Its stock of sea turtles rose to 80,000. This is over fifteen times the number of sea turtles living in the wild in the western Caribbean and the Gulf of Mexico.

The Cayman Turtle Farm regularly released turtles into the wild, resulting in a substantial increase in the wild turtle population. The Cayman Turtle Farm also insisted that all its customers sign contracts promising not to use wild turtle products.

With the imposition of the 1978 US ban on sea turtle products the Cayman Turtle Farm began to fail. It is now run on a much reduced scale by the Cayman government as a tourist attraction. There has been a substantial drop in the sea turtle population as a result. The US ban has also created a black market for sea turtle products because of the increased profit margins. The black marketeers obtain their supplies by trapping wild turtles at an alarming rate.

The history of the Cayman Turtle Farm is a striking example of how the commercial management and cultivation of endangered species can help the species survive and even prosper far more effectively than blanket bans on trade in their products. The environmentalists no doubt felt good once they had banned all trade in the turtles and their products. The same could not be said for the turtles, whose very survival is at risk.

U is for **UNLIMITED RESOURCES**

The growing dearth of natural resources has long been a theme song of the Greens. The 1980 report to the US President, "Global 2000," which is the source of many of today's popular environmental fallacies, projected a growing shortage of non-fuel minerals. This shortage would be reflected in a 5 percent annual increase in their real price (allowing for inflation) until the year 2,000. In fact there has been a substantial fall in their real prices since then.

Why do environmentalists get their forecasts so hopelessly wrong? They are apt to forget the sheer scale of our planet in comparison with the activities of the human race. Thus the top mile of the earth's crust is estimated to contain a million times the quantity of minerals in present known reserves. As the latter represent roughly a hundred years' supplies, the implication is that we have enough minerals to last us 100 million years.

In any case, estimates of reserves at any one time never represent the reserves that are actually available regardless of demand and price. Geologists seek out new reserves as they are needed. The extent of raw material reserves is calculated on the assumption that they will be put to use with existing technology. Yet there is a marked long-term trend in free market economies towards more economical use of them, spurred by the continuing efforts of businessmen to cut costs, including those of materials.

In the USA energy consumption per $1,000 of GNP has been declining at the rate of 1 percent per year since 1929. Between 1975 and 1985, steel consumption per capita declined in Western economies by about 2 percent per year. Again, US domestic production of tractors and combines fell substantially between 1970 and 1987, while grain production increased.

A growing proportion of GNP in industrialized free market economies consists of those services which require very little in the way of raw materials. And human ingenuity creates entirely new materials, often enormously cheaper than those they displace. A notable example is the substitution of fibre optics for copper cables in telecommunications. An earlier example was the replacement of women's silk stockings by nylons. All of which illustrates the argument of Julian Simon, leading critic of the eco-doomsters, that the ultimate resource is the human mind, which is virtually unlimited.

V is for **VEGETABLES, superiority of**

It is often argued that if only the West stopped eating meat, the problem of hunger in the Third World would be solved, and that a vegetarian diet would also benefit the population of the West because it is healthier. There are wilder claims that meat-eating makes people aggressive, whereas vegetarians are more gentle souls.

It is asserted that if land were not used for meat production it could be used for the production of cereals and this could feed greater numbers. This argument is flawed. Three-quarters of British agricultural land is not suitable for arable production, with grass being the only crop grown in such areas. Further, animal husbandry is often the only viable farming on marginal land in poorer countries, and animal products such as milk and eggs can add proteins to a diet which would otherwise be deficient.

The amount of grain used for meat production in the UK is less than one-third of the supplies available after domestic human needs have been met. It is a nonsense to assume that this grain could simply be transferred to feed the Third World: the UK overproduces grain which is simply stockpiled; and there is more grain produced world-wide than can be sold. The famines which have occurred in Africa were not due to any under-supply of food on a global scale, but were due to failures in economic management by various Marxist regimes, and the ravages of war.

The merits or otherwise of a vegetarian diet are much debated by experts. Many dieticians suggest that a well balanced mixed diet is the healthiest. It is absurd to suggest, as some vegetarian activists do, that eating meat is unhealthy per se. Having said that, there is little evidence that a vegetarian diet is harmful, although some of its adherents seem to be infected by sanctimoniousness.

Another anti-meat argument often made is that the Amazon rainforest is being chopped down in order to provide grazing for cattle, the meat of which then goes into McDonald's hamburgers consumed in the West. Some environmental groups have led consumer boycotts of McDonald's, and have taken advertising space to attack the firm. This argument has one major drawback. It is not true. McDonald's do not use cattle from South America.

All in all, many of the arguments used against meat are not based on scientific fact; they simply reflect the prejudices of those opposed to meat-eating, fast food and Western culture.

for **WHALES**

The response of many to the issue of whaling is purely emotional. On the one hand the environmental movement has turned the whale into a popular and effective symbol for their campaigns; on the other whaling communities have a strong attachment to their traditional way of life. These conflicting passions have tended to obscure the scientific facts.

The International Whaling Commission, or IWC, was established in 1946 by the whaling countries themselves in order to set quotas for each country's annual catch so that stocks would not be depleted. Whaling had been so intensive that the very survival of certain types of whale was threatened. The reason for this was that whales were - and for that matter still are - owned by no-one, so it was in each whaler's immediate interest to catch as many as possible (for fear of another making the catch) regardless of long term impact on stock. The system of quotas was not effective at first, but gradually became more so.

Countries without a whaling tradition began to join the IWC. For many of their governments, joining the IWC - and then pushing for a ban on commercial whaling - was an easy way of appeasing their environmental movements without any real consequences to themselves. In 1959 the IWC had 11 members, all of them whaling nations. By 1980 its membership had risen to 22 - this included land-locked Switzerland. Today the IWC has 38 members.

In 1982 the IWC decided to adopt a general moratorium on commercial whaling. This was to come into force in 1986 for Minke whales in the North East Atlantic. The Minke is by far the most common whale, but there had been disagreement about the size of the remaining stock. The moratorium was imposed in order for a scientific committee adequately to assess the populations of the different types of whale, and then recommend appropriate policy.

In 1992 the scientific committee of the IWC recommended that it would be safe to restart commercial whaling of Minke. The scientific committee assessed the North East Atlantic stock of minke to be between 61,000 and 117,000 and world-wide Minke stocks to be circa 1,000,000. The anti-whaling lobby, however, ignored this advice and imposed a permanent ban on the commercial whaling of all species at the 1993 IWC meeting in Kyoto, Japan. The chairman of the scientific committee, Dr Philip Hammond, resigned in protest of their recommendations being ignored. Only after this did Norway decide to restart small scale whaling exclusively of the Minke.

The environmental movement tends to throw all species of whale into one basket claiming, they are all endangered. While the stock of certain species of whale are still relatively low - it is for example estimated that there are only around 3000 Blue whales - this is not true for all species, certainly not of the Minke. The general anti-whaling attitude is more of an emotional than a scientific one.

The best way to save the whales from the extinction which threa-

them if they remain part of the common property of mankind to privatize them. One proposal is that they should become the property of the International Whaling Commission, which could then sell them off to individuals, companies or conservation groups, thus raising money for its enforcement role. Owners would have an incentive to preserve their whales and increase their numbers through breeding.

Maintaining these property rights may seem as hopeless a task as belling the cat in the fable, yet tracking and identifying the whales may be easier than it looks. Whales, which travel in pods on regular migration routes, could be tagged with transmitters broadcasting on unique frequencies. The pods could then be auctioned. The approach may appear bizarre, but is in principle no different from branding steers, and would probably be more efficient in foiling rustlers.

W is for **WIND POWER**

Wind power has an important and useful contribution to make towards a balanced supply of electricity. In California, for example, private businesses have provided 17000 small scale wind powered turbines producing between 17 and 600 kilowatts of electricity, which are both dependable and cheap. It is not, however, the cure-all panacea some in the environmental movement see it as.

Many large scale government funded wind power projects have proved to be failures. To give an example, a $30 million publicly funded wind power project in Southern California was scrapped, because it simply did not produce the required results. The actual machinery was sold for salvage for only $51,000.

For wind power to work well one needs the right conditions. These are winds that blow relatively constantly at about 15 miles per hour. This is clearly not the case for large parts of the globe. Wind power stations use up a large amount of space and are often unsightly.

It has been estimated that for wind power to provide 19% of the USA's electricity 63,000 wind mills, each being 300 feet high and 100 feet across, would be needed. This is supposing there is a constant steady wind. In the UK an area the size of Greater Manchester would have to be covered with 600 wind mills - each taller than St. Paul's cathedral - just to generate the same amount of electricity as any one of the 74 power stations run by the former CEGB in 1990. These figures are probably an underestimate, for electro wind mills of this size are less efficient than smaller ones.

Wind power stations are usually very noisy. In many instances this has meant rehousing those living near to "wind farms", which obviously increases the cost. Conservationists have drawn attention to the threat which wind farms pose to wild birds. In some cases hundreds of birds are killed annually by the blades of a

single row of mills.

While wind power will play an increasingly important role in the supply of electricity with advancing technology, it is unlikely that it will ever be able to replace more conventional forms of electricity generation. It may perhaps generate a few percent of the power required by a modern economy; not more.

X is for **XENON-133**

Environmentalists like to dramatise what they call "the radiation threat." In fact there are several forms of natural background radiation, and several man-made forms. In some cases the background radiation exceeds that created by man. Radon, a radioactive gas released from rocks, puts out far more radiation than do nuclear power stations. Some radiation even helps mankind.

Xenon-133 is a radioactive gas. It is now being used in advanced methods of lung scanning. As in other methods of nuclear scanning, a small amount of the substance is injected into the blood stream. This enables a recording device - known as a Nuclear Magnetic Resonance Imager, or NMRI for short - to detect any abnormalities at an early stage.

Xenon-133 is just one of many radioactive substances used in nuclear scanning. These have saved many lives by detecting cancerous tumours far earlier than they would otherwise have been. Radiation can, therefore, also save lives and is not the unalloyed evil many in the environmental movement believe it to be.

Y is for **YELLOWSTONE NATIONAL PARK**

Yellowstone National Park was set up in 1872 to protect one of the most scenic and beautiful wilderness areas in the USA. Yellowstone is still best famous for its spectacular landscape and wide range of wildlife. What is less well known is that this National Park is extremely badly managed.

70% of the Yellowstone eco-system is owned by the US government, and is run by five separate agencies. This plethora of bureaucrats has, however, implemented many policies which have actually harmed the environment:

- Yellowstone Park Rangers have killed at least 261 Grizzly Bears in the last 18 years, which leaves a population of only 200 Grizzly Bears in the park today;

- The Park Service has closed rubbish dumps to the Bears, which has meant that there has been a steady rise in the number of human fatalities caused by Grizzlies interrupted while foraging for food;

- The Park Service has let the Elk and Bison populations grow out of control. This has led to over-grazing, and reduced the habitat of other species. The Beaver population in Yellowstone has, for example, become virtually extinct.

Alston Chase, a pre-eminent wildlife expert, has noted that " over the last 70 years nearly every conceivable mistake that could be made in wildlife management has been made by the Park Service in Yellowstone." Yellowstone's record looks especially gruesome when compared with the many well-organized private nature reserves. Once again the private sector out-performs the public sector as a protector of the environment.

Z is for **ZOOS**

Zoos have come in for much criticism from many in the environmental movement. It is often claimed that animals suffer by being enclosed in zoos. Some animal rights activists go so far as to claim that man has no right to keep animals, and that zoos are tantamount to prisons. This attitude has led to attacks on zoos in which extremists have forced their way in to "liberate" animals. Sadly many of the animals thus "freed" have subsequently died, for their "liberators" have not known how to look after them, and those released have not known how to survive in a strange habitat.

Zoos have in fact done much to protect many species of animal, and helped to guarantee their long term survival. Virtually all major zoos are actively involved in significant international captive breeding programmes. London Zoo, for example, is breeding everything from the English Field Cricket to the Sumatran Tiger and the Black Rhino. This is often the best way of protecting endangered species and boosting their population. It gives these animals a safe haven. The Sumatran Tiger has, for example, been so heavily poached that only 600 survive in the wild; they are only guaranteed protection in zoos.

Once sufficient animals of a particular species have been bred in captivity, it can be released back into the wild. London Zoo has been involved in the reintroduction of the Golden Island Tamarind into Brazil and the Arabian Oryx into Oman, among many other such schemes. Research into animals kept in captivity has also led to many discoveries being made which have helped the protection of the relevant species.

Zoos are not just there for the voyeuristic delight of city dwellers. They do have an important educational role to play for those denied the opportunity to see the relevant animals in the wild. They also play an important role in preventing many species from becoming extinct.