

An Historical and Cultural Perspective **on the World Ecological Crisis**

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Introduction

The population of the world is growing, food production is stagnating, oil is running out, and we are destroying the resource base we depend on for life. These are all related in interlocking ways that are sure to result in a global crisis (already begun) in the easily foreseeable future; the *compound crisis* of population, food, oil, soil, and water. Politics and business have joined hands to tell us that poverty and famine can be eliminated by economic growth, but economic growth appears to be the engine behind the compound crisis, rather than the panacea that it is being made out to be. This paper shows how conventional economic thought has been mistaken and harmful, how very basic and unquestioned assumptions have led humanity into an ecological impasse, and suggests a method for attempting to avoid the oncoming disaster.

This paper does not mention, or makes only very brief mention of, the 'pollution-type' (global warming, ozone layer destruction, acid rain, toxification of the environment by radiation or synthetic chemicals), as these are considered to be a subset of the human-induced ecological crisis described below. It is not intended to deny or lessen the importance of these issues, any one of which could prove to be instrumental in the extinction of humanity from the face of the Earth. On the other hand, progress in alleviating the effects of the ecological crisis will almost certainly result in positive trends concerning these problems, as should be clear from the argument.

Part One: The 'Compound Crisis' of Population, Food, Oil, Soil, and Water

1.-1. Population

As we approach the end of the 20th Century, the population of the world is approximately twelve times what it was just 350 years ago. Although the overall rate of population increase has declined over the last thirty years, it is only just recently that the absolute numbers of people being added to the world's population each year

has begun to fall, an indication perhaps that we are beginning to approach global limits. (Table 1-1)

Table 1-1

| Year | World Population (m) | Growth Rate | Doubling Time | Additional People per Year (m) |
|---------------------|----------------------|-------------|---------------|--------------------------------|
| 8000 _{BCE} | 5 | | | |
| 0 | 250 | | | |
| 1650 | 500 | 0.3% | 250 years | 1.5 |
| 1825 | 1000 | | | |
| 1900 | 1600 | 0.5% | 140 years | 8 |
| 1930 | 2000 | | | |
| 1960 | 3000 | | | |
| 1970 | 3600 | 2.1% | 34 years | 76 |
| 1975 | 4000 | | | |
| 1987 | 5000 | | | |
| 1991 | 5400 | 1.7% | 41 years | 92 |
| 1995 | 5700 | 1.6% | 43 years | 91 |
| 1998 | 6000 | | | |

Source: Meadows, D.H., D.L. Meadows, and J. Randers, *Beyond The Limits*, Earthscan, 1992, p.23

Current population figures give us a rough idea of where we are now. (Table 1-2)

Table 1-2

| | |
|--|---------------|
| Approximate world population end 1995 | 5,804,670,000 |
| Approximate world population end 1996 | 5,896,293,000 |
| Approximate increase in population in 1996 | 91,623,000 |
| An estimate of world population end 1997 | 5,988,000,000 |

Source: Tokyo Shinbun, 1996/1/7, 1997/1/5 (Sunday supplement)

The most conservative projection suggests that world population in 2020 will be a touch over 7,260,000,000¹, an *average* addition of roughly 60,000,000 people each year until then. At the *current* growth rate of just under 1.6%, the world's population in 2020 will be 8,453,000,000, and that level of population and rate of increase would mean the addition of more than 130,000,000 extra people per year.

Whichever it turns out to be, most of the increase will come in the so-called 'developing' countries. More than thirty, mostly industrialized, countries, including Japan, have already reached a fertility rate below replacement level (a total fertility rate [TFR] of less than 2.0) which is required to achieve zero population growth (ZPG) or a declining population.² Halting population growth, and the transition to population decline, especially in the 'developing' countries, is one of the keys to a

stable and humane future for mankind, as will be argued below.

1.-2. Food

More people, more food. In 1981, world harvested grainland area peaked at 735 million hectares (m ha). Then it began to shrink, dropping to 695 m ha in 1993.³ China is losing nearly 1 m ha (or 1 percent) of its cropland a year.⁴ Japan harvested 5 m ha in 1960, but only about half that now.⁵ From 1950 to 1995, world cropland per person shrank from 0.23 ha to 0.12 ha.⁶ In China the figures were 0.17 ha to 0.08 ha.⁷

Grain yields are said to have risen at about 2.2% per year since 1980, but as cropland shrinks world grain production has leveled out at around 1.7 to 1.8 billion tons.⁸ Grain production *per person* has therefore dropped, and demand has been met by drawing down stocks. World carryover stocks of grain have fallen from an all-time high of 465 m tons in 1987 to a low of about 260 m tons in 1995/96 (little more than pipeline supplies)⁹, forcing grain prices to double between 1994 and 1996.¹⁰ Japan being the world's largest single importer of grain (around 27 m tons, 72% of consumption in 1994¹¹), the trend has not been lost on the Japanese Ministry of Agriculture and Fisheries, who predicted in December 1995 that world grain prices would double by the year 2010.¹² The doubling occurred rather earlier than the ministry had predicted, but the current surge in prices is thought to be only a temporary fluctuation.¹³ What the ministry is predicting, more importantly, is that in 2010 prices are likely to be *stable* at double the 1994 pre-surge price.

The peak year for the world seafood harvest was 1989, at about 100 m tons. Since then the catch has declined.¹⁴ Nine of the world's 17 major fishing grounds are now in 'precipitous decline' and four are "fished out" commercially.¹⁵ Similarly, the world's rangelands are being grazed at or beyond capacity on every continent.¹⁶

At the same time, 'developing' countries, especially in those areas now experiencing fast economic growth — south-east Asia and China — aspire to higher standards of living. That means their diets change as they tend to eat higher up the food chain. As they do, per capita consumption of grain processed into animal protein is beginning to rise. Of the 1.72 billion tons of grain consumed worldwide in 1992, an estimated 635 m tons (37%) were fed to livestock, poultry and fish.¹⁷ Despite the trend towards lower consumption of animal protein (meat) in the advanced industrial countries, the 'developing' world continues to want to 'eat better'.

A rising world population, many more people aspiring to more affluent lifestyles, and a shrinking resource base will inevitably lead to grain shortfalls in the medium term future (before 2020). One estimate is a shortfall of 526 m tons in 2030,

assuming a world population of 8.9 billion people.¹⁸ The world grain harvest for that year is projected to be 2.1 billion tons, or 236 kg. of grain per person. (The historic high for grain production was in 1984; 346 kg. per person.) In terms of wheat, 236 kg. would be about 2200 kcal of food per person per day,¹⁹ but this is highly speculative as 1) total world grain exports have never gone much over 200 m tons/year and are unlikely to do so in the future, and 2) it is no more probable that the food will be distributed equitably in 2030 than it was in 1984, better remembered by some as a year of major famine in the Horn of Africa.

Countries now experiencing high levels of population growth, or which are heavily dependent on imports of grain and other foodstuffs to feed their populations, should be planning ahead for the time when world grain markets will be far more severely stressed than they are now. Certain studies indicate, for example, that by the second decade of the 21st Century the United States could cease to be an exporter of grain due to population increase and resource base degradation.²⁰ Efforts to curb population growth, increase self-sufficiency in food production, and move towards lower consumption levels of animal protein could all help alleviate the most serious problems of food shortfall likely to be experienced within the next thirty years. These measures are not, however, considered sufficient for the alleviation of world poverty and hunger, a subject that will be addressed in detail below.

1.-3. Oil, Other Fossil Fuels, and Other Energy Sources

An inescapable fact of our current industrial, hi-tech lifestyle is that we are heavily dependent on fossil fuels, especially oil. What man (mostly) has very cleverly learned to do is to utilize not only his solar income, but also capital savings which were laid down in previous geological eras.²¹ Consider also that the so-called *Industrial Revolution* is a misnomer! It was really an *Energy Revolution* – a fossil fuel revolution. Our whole industrial, materialistic, consumerist, corporation-dominated lifestyle is built on fossil fuels, without which it could not have happened and cannot be maintained.

Not so bad, perhaps, if we had had the sense to use these fossil resources with wisdom and foresight. Take a look around. We are wasting these resources at an exponential rate of growth just as the end is coming into sight. Try this calculation:

| | |
|--|-----------------------|
| World consumption of oil 1990 ^a | 24.0 billion barrels |
| Oil reserves end 1995 ^b | 939.0 billion barrels |
| Oil reserves added in 1995 ^b | 5.7 billion barrels |

Sources: a: Meadows, D.H., Dennis L. Meadows, and Jorgen Randers, *Beyond the Limits*, Earthscan, 1992, p.7

b: Petroconsultants WWW page: <http://www.petroconsultants.com/gen/new5.htm>

Assume that we are going to continue to consume oil at the 1990 rate (conservative), and also that new discoveries will continue to add oil reserves at the 1995 rate (optimistic). Subtract additions from consumption to find effective consumption per year (18.3 billion barrels) and then divide current reserves by that to find how many years we can continue our lifestyle at current consumption rates. 51 years.

Other sources show that known reserves of oil were 1.01 trillion barrels, and reserves of gas 63.2 trillion cubic meters in 1995. At current rates of consumption oil would be expected to last for 43 years and gas for 65 years. The U.S. Geological Survey estimates that ultimately up to 2.1 trillion barrels of oil could be produced economically worldwide. Approximately one trillion barrels have already been used, the remainder would last for a further 95 years at current consumption rates.²² Higher consumption rates will mean that oil will run out faster. Under present economic growth and 'development' policies, another half century of oil use is probably an optimistic outlook.

Certainly there are other fossil fuels (coal) and there are other ways of obtaining energy, some of which are sustainable and friendly. But the fact is, as with almost any resource anywhere, the best and most easily extractable ones will be exploited first. Then you go for the next most easily extractable and next highest quality ones. Eventually you will be struggling in harsh environments to extract poor quality resources, at which point the only option remaining is a change of lifestyle.

Bearing in mind the simplicity with which it is possible to do the calculation above, continuing to insist on oil-based economic growth is simply not acceptable. What we are doing is wasting the best resources *in a direct attack on* the entire resource base; throwing away our inherited savings account in ways that are almost guaranteed to bring severe pain in the foreseeable future.

Neither does nuclear power (whether fission or fusion) appear to have the potential to meet current levels of energy needs, despite claims that carbon dioxide is not emitted and therefore expanded reliance upon nuclear power is a valid policy against global warming. Firstly, concern over low-level radiation from routine emissions, anxiety over catastrophic accidents at nuclear facilities, fears of nuclear weapons proliferation, public and international uneasiness over the transportation of plutonium, doubts about the technical feasibility of nuclear waste disposal, and uncertainty surrounding the economics of power plant decommissioning have led to a deep-seated mistrust of nuclear power among both the public and potential investors.

Secondly, nuclear power plant construction and decommissioning, uranium mining, ore processing and enrichment all involve considerable emissions of carbon dioxide. These are expected to rise as ore grades fall, as outlined above. The inability to estimate energy requirements for plant decommissioning and permanent waste storage make it rather doubtful that there are any great savings in carbon dioxide emissions to be gained from this technology.²³

Thirdly, it is estimated that if the electricity generating capacity of the world were to be provided by nuclear power, current known resources of uranium would last only around another fifty years.²⁴ This could be extended by a factor of 60 by the use of fast breeder reactors. However, the accident at the Monju prototype fast breeder reactor in Japan in December 1995 and the French decision in June 1997 to scrap the demonstration fast breeder reactor Superphenix has now made it very unlikely that fast breeder reactor technology will ever become commercial.²⁵

Nuclear fusion technology is also known to have several serious problems, one of which is the doubt about whether it can actually be made to work or not. Fusion facilities are very expensive and require large amounts of real estate. One estimate is that a fusion power station would require seven times the area of an equivalent fission power station. The problem of escape of tritium into the environment is grave; with a half-life of 12 years, tritium is exceedingly toxic to humans in very small amounts, and is known to penetrate metal, glass and plastic when hot. Tritium causes large volumes of the inner materials of fusion reactors to become highly radioactive, leading to doubts about the lifetime of reactors, and serious logistical problems in decommissioning. It is quite probable that electricity generation by nuclear fusion technology will never be commercially viable; it is technologically doubtful, expensive, dangerous, and highly radioactive.²⁶

In 1949, M. King Hubbert, a petroleum geologist employed at the time by Shell Oil, stated that the current (second) phase of human history, based on the exploitation of fossil fuels and industrial metals, can only be transitory due to the finite nature of these resources. He went on to say that:

The third phase, therefore, must again become one of slow rates of growth, but initially at least with a large population and a high rate of energy consumption. Perhaps the foremost problem facing mankind at present is that of how to make the transition from the present exponential-growth phase to the near steady state of the future by as noncatastrophic a progression as possible.²⁷

This perception of historical time is the one that we need to adopt with respect to the current problems facing humanity, in contrast to those currently in vogue, namely time horizons of five years or less. The overwhelming emphasis on maximizing short-term profit and attempting to externalize as many costs as possible is leading us down the road to certain disaster. The sooner we can reduce our dependence on fossil fuels and initiate the transition to renewable and truly sustainable energy sources, the sooner we can reduce carbon dioxide emissions and acid rain, and begin the real task of making the transition to the 'third phase' of human history.

1.-4. Soil and Water

Although capital-intensive industrial farming has made possible the production of huge amounts of food, it has done so at the cost of massive inputs of energy and chemicals (in many ways oil-dependent), *and* at the cost of declining efficiency of use of those resources. Mechanization of farming poses a double threat in that it makes *food production dependent on nonrenewable fuels and gradually destroys the basic resource of farming, soil.*²⁸ These threats are generally reversible, but only at a great cost in terms of time, effort and socio-economic arrangements.

As long as sedentary farming is practiced, soil erosion will always be with us. Mechanical farming has exacerbated the problem to such an extent that it is now common knowledge that modern farming methods are just not sustainable.

Two hundred years ago most cropland in the U.S.A. had at least 21 inches of topsoil. Today one-third of prime topsoil is lost. Less than 6 inches remain in some places. Iowa has lost over half its topsoil in less than a century. Each year over 4 billion tons of topsoil are lost to rain erosion, and 3 billion to wind erosion in the U.S.A.²⁹ The EC estimates that over 25 m ha (an area eight times the size of The Netherlands) of farmland in Europe are threatened by soil erosion, while in the U.S.A. over 400,000 ha of land are being lost to soil erosion each year.³⁰ An estimated 24 billion tonnes of soil is being eroded from the world's agricultural lands every year —enough to fill a train of freight cars stretching *from the Earth to the Moon, and back, five times.*³¹ Overgrazing, overcropping, deforestation, industrial-agribusiness style farming based on fossil fuel-operated machinery, agricultural petrochemicals, and fossil fuel-dependent chemical fertilizers are to blame.³²

Calculate for yourself that if 1 hectare-inch of topsoil weighs around 400 tons and the U.S.A. has approximately 140 m ha of cropland, then at 7 billion tons of topsoil lost per year, on average an inch of topsoil will be lost from every hectare of U.S.A. cropland every eight years. (The world average may be about 12 years.³³) Losing an inch of topsoil reduces corn and wheat yields an average of 6%. Nature requires

centuries (200 to 1000 years³⁴) to regenerate that inch of topsoil³⁵.

So, the soil is being mined. The nutrients in the wheat from Kansas and the corn from Iowa are ending up in the sewage discharges of Tokyo and elsewhere. Farmers have relied on chemical fertilizers to maintain soil fertility, but this is no substitute for lost topsoil. The use of chemical fertilizers has now probably passed the point where additional application results in increased yield, evidenced by falling application rates in the last few years.³⁶

Water is also being mined. The frontier of water resources is disappearing now just as the land frontier disappeared in mid-century. Water is now extracted from aquifers for irrigation at non-sustainable rates. In the U.S.A. water tables are falling by between six inches and four feet a year beneath one quarter of irrigated land area.³⁷ Saudi Arabia is now mining its fossil groundwater at such a pace that the supply is likely to be exhausted in about 50 years' time.³⁸

With 22% of the world's population and only 8% of the world's fresh water, China faces severe water supply shortfall problems. This is particularly apparent in the North China Plain, around the farming and industrial area of Beijing and Tianjin. Beijing's water tables have been dropping by one to two meters per year and at least one third of its wells have gone dry. Tianjin faces a water shortfall of 36% by the end of the 1990s.³⁹

At least 26 countries, with a combined population of around 250 m, are now considered to be 'water-scarce', defined as possessing annual water resources of less than 1,000 cubic meters per person. The majority of these countries are in Africa and the Middle East, and have high rates of population growth.⁴⁰ With nothing that even looks like a solution in sight, the maintenance of the fragile basis for a minimal quality of life in this region is certain to be further eroded in the years to come.

Water efficient agricultural practices such as surge irrigation, low-energy precision application sprinklers, and micro-irrigation techniques can help reduce demand for water by the largest water user, the agricultural sector,⁴¹ and efforts to improve water use efficiency in the industrial and domestic sectors can help stave off chronic water shortages for some time. Sudden water shortages caused by unusual lack of rain, as in Japan in 1994, are more problematical and can result in severe stress even in normally water-abundant industrialized countries.

There are also clear geographical and social limits to large-scale dam and reservoir construction. The Japanese government recently abandoned or suspended 18 dam

projects due to doubts about the cost-benefit use of public funds for such large-scale water projects, and pressure from local opposition to dam construction.⁴² Further, dams are only effective so long as rain actually falls. Having received very little rain during the months of July and August 1994, the Ishitegawa Dam (capacity 6,300,000 cubic meters and the main dam serving Matsuyama, population 450,000) was declared dry—absolutely no water!—on August 26th, shocking the whole Japanese nation.⁴³

Also recall that the only time in history when consumption of grain exceeded production in the U.S.A. was in the drought year of 1988.⁴⁴ Exporting a ton of wheat is equivalent to exporting 1000 tons of water,⁴⁵ but with the world more dependent on the U.S.A. for grain (nearly half of all exports) than it is on Saudi Arabia for oil,⁴⁶ then we had better hope that U.S. agriculture gets its house in order as regards the use of water.

In the final analysis, sustainable use of water resources and efficiency of water consumption are not sufficient solutions. Only efforts to reduce population, and change to lifestyles less reliant on large-scale water consumption can be considered viable long-term solutions.

Coming fuel shortages mean that industry, domestic consumption, and agriculture will have to compete for depleting supplies—just those fuel supplies that make it possible for capital-intensive industrial agriculture to feed our expanding population, while at the same time degrading the resource base that we ultimately depend on. This is the meaning of the *compound crisis*; world population, food production, and soil, water and energy resources are not separate issues but *an interlocking set of conditions which must be met in order for the system as a whole to maintain its viability*. The failure or disruption of any one element could lead to a catastrophe of worldwide dimensions. In such a fragile environment, we cannot possibly continue to misdirect and mismanage population policy. Likewise, we would do ourselves a favor, for example, by making serious consideration of a transition to non-mechanical organic farming. That means looking for ways that animals, a labor force, farming techniques, and socio-economic arrangements that do not exist now could be put into place. It cannot be done overnight. It might in fact take the fifty or so years of oil consumption we have left to effect a transition of this nature.

Part 2: The Growth Treadmill and the Globalized Economy

The argument in Part 1 paints a grim picture of a creeping disaster likely to become a

real catastrophe within the next few decades. It is already a 'gradual Hiroshima' that is unfolding in our midst.⁴⁷ Optimistic statements by politicians and business representatives to the contrary, there is a general feeling that humanity is heading slowly towards something very unpleasant. If things are so serious then why do we not just stop? The answer is that we cannot, because we are stuck in an economic growth mindset.

2.-1. Growth for what?

Although most people would now agree, if they stop and think about it, that advanced industrialized society faces a myriad of seemingly intractable problems, few would oppose the almost daily calls from politicians and business leaders for the speeding up of the economy—for more economic growth. Neither are they usually suspicious of the oft-stated notion that economic growth is what we need to solve these problems.

One thing we do not seem to hear quite so often recently is that economic growth will eventually usher in a golden age of affluence and leisure where everyone will enjoy a higher standard of living and a higher quality of life; more goods and services, more leisure, greater welfare, greater happiness. The general feeling is that economic growth has brought us undoubted benefits, that we are now closer to that 'golden age' than before, and that as the economy grows we will continue to progress towards that goal. We who are fortunate in living in the advanced industrialized world may certainly feel that way as we continue to enjoy an ever-higher standard of living, a greater consumption of material wealth. But, as mentioned above, has the rising standard of living not been accompanied by rising social and environmental costs? And what of the quality of life, welfare, and happiness?

Richard Douthwaite has shown quite convincingly that the quality of life (as perceived subjectively over a large population) has failed to improve, or only improved marginally, as the economies of Europe have grown in the last fifty years. One survey carried out in Britain in 1975 asked people to rate the quality of life on a scale of 1-10 and to say what they thought it had been five years ago and what they expected it to be in five years' time. They rated the quality of life in 1970 at 8, at 7.2 in 1975, and expected that (assuming no big social and economic changes) the quality of life in 1980 would be 6.⁴⁸

Improvements (or deteriorations) can also be described objectively through the use of statistics. Douthwaite shows that despite steady economic growth in the United Kingdom between 1955 and 1988, Britain became a steadily less healthy nation. 33 percent of the population had a long-standing illness in 1988, compared with 21

percent in 1972. Eight percent of people interviewed in 1971 reported being acutely ill during the preceding two weeks, but in 1988 that figure rose to 14 percent. The average number of days for which the state paid out sickness and invalidity benefits to each insured worker rose from 8.8 in 1962 to 12.2 in 1988. And so on, and so on.⁴⁹

There has been a great increase in chronic complaints in recent decades. The increase in asthma in Britain has been extremely sharp; almost 30 percent of British children now suffer from asthma sometime during their childhood, and by 1990 hospital admissions for children up to the age of fourteen were ten times higher than they had been thirty years previously.⁵⁰ Also on the increase are the 'diseases of affluence' and cancers. A recent report shows that in the United States the number of child cancers are rising at a phenomenal rate; 60 percent for testicular cancer, 50 percent for bone cancers, 30 percent for brain tumors, and 10 percent for leukemia.⁵¹ All of these are related to diet (increased intake of sugar and fats, food additives and so on), environmental factors such as atmospheric pollution, magnetic fields and electromagnetic radiation, and chemical toxification of the environment, all of which again are inextricably linked with economic growth.⁵²

More recently, the effect of dioxins, PCBs and DDT on the immune system and as hormone disruptors has been brought into sharp focus, reminding us of the health dangers we expose ourselves to as we rush forward, headlong and unthinking, in our pursuit of economic growth. Having decimated the wildlife of the advanced industrial countries with synthetic chemicals, we are now spoiling the future by destroying the basis of our own reproductive health, while at the same time dismantling our natural ability to deal with disease.⁵³

Or what could be more symbolic of our quality of life than the quality of our family and community life? Here again, Douthwaite shows that every area of family and community life, divorce rates, child development, crime, violence, and civil liberties has suffered setbacks as the economy has grown. The assault on civil liberties in the United Kingdom reached a vicious new high during the Conservative governments of Margaret Thatcher and John Major, governments whose main stated purpose was to improve standards of living through 'wealth creation'—economic growth. The legacy of their four terms of office have been the Police and Criminal Evidence Act 1984, the Prevention and Terrorism Act 1984, the Public Order Act 1986, the Official Secrets Act 1989, and the Criminal Justice Act 1994, all of which served to increase the power of the state at the expense of the freedoms of the individual.⁵⁴ Although most of us would certainly equate more freedom with a higher quality of life, it appears that the loss freedom is one of the things we must put up with for a higher standard of living.

Daly and Cobb have devised an Index of Sustainable Economic Welfare (ISEW), which they claim gives a better picture of economic welfare for the U.S. economy than GNP figures. The results confirm the general drift of the discussion above. The index shows steady growth during the 1960s, peaking at 1969. ISEW remained level for the 1970s, but began to *decline* in the 1980s, declining at an average 1.26 percent between 1980 and 1986 while GNP rose at an average 1.84% in the same period.⁵⁵

So can economic growth provide us with a higher quality of life, more personal satisfaction, more 'happiness'? Certainly not, argue Daly and Cobb. Satisfaction in life felt by individuals is a function of how they stand in relation to other individuals in the community. People who are relatively better off generally report that they are happier than do individuals of relatively lower status. This is true across time in the same society or across different societies, regardless of their absolute level of consumption. Neither do people in affluent societies report that they are happier than people in poorer ones. "In short," say Daly and Cobb, "the absolute level of economic well-being contributes little to personal satisfaction, whereas the relative level within a given society contributes considerably."⁵⁶

But does this mean that people need differences in relative status in order to feel satisfaction or happiness? Before a road was built in 1962 to link Ladakh with the rest of India, the Ladakhis lived in isolation in their harsh and barren environment. But they had managed to sustain "a remarkably rich culture, one that met not only their material wants but their psychological and spiritual needs as well."⁵⁷ The Ladakhis lived a completely self-sufficient, community-based lifestyle, and although poor by our affluent standards, had no poverty. That is, relative levels of wealth were never so great that any person in their community were deprived of the material basis for life. The Ladakhis were proud of their material and spiritual culture, but in the 1960s and '70s, as contact with the outside world increased and as they were drawn into the global money economy, the Ladakhis pride and faith in their culture was totally destroyed. They had begun to see themselves as 'poor'. What made them so unhappy was their perceived difference between their traditional lifestyle and that of the consumerist western lifestyle. What economic growth, the race for personal and private wealth, and the consumerist culture has brought us is an exacerbation of the perception of relative status, and a de-emphasis of community and spiritual values. Small wonder really that higher standards of living have resulted in a lower quality of life.

2.-2. So Why Do We Bother?

If it can be shown that economic growth and higher standards of living (more

consumption) lead inevitably to a lower quality of life, then why do we not simply renounce growth and concentrate on raising the quality of our societies rather than the quantity?

One reason is that we tend to be more aware of benefits than of costs. Often the benefits are close to hand (we enjoy them personally) while the costs are displaced in time and distance and are therefore much harder to perceive. We may become aware of the deleterious effects at a later date, but by then it will be far too late to prevent the purchase of the article, whether it be a medicine which turns out have unwanted side-effects, a consumer durable such as a television or a computer, or a major capital investment such as a power station or a road.

We generally regard the cost of an item as being the money price we have paid for it. This, however frequently does not reflect the full costs of the item we have bought. Our economists have taught us that, effectively, the fruits of nature are free. When we pay for something we are paying the price we have to pay someone to induce them to 'produce' the article we buy.⁵⁸ The resources used, the cost to the environment of the production process, and the social and environmental costs incurred in the consumption and final disposal of the article are (or generally have been until quite recently) treated as free goods and services provided by the Earth. (What economists call 'externalities.')

Businesses make profits from the difference between the costs of the 'production' process and the price we pay for the article. As many costs as possible are treated as externalities in order to maintain profit margins and the illusion that a 'good' is being created without any ill effects. American tobacco companies are now learning the hard way that the cost of medical treatment for tobacco-related illness can no longer be treated as an externality. Capital-intensive, industrial farming has for too long been allowed to claim credit for increased food production without adequate accounting of the social and environmental costs of a degraded resource base, as noted above.

Another well-documented case is the car (automobile), one of our favorite symbols of relative economic status and freedom. Increased personal convenience and mobility, the feeling of power at our control, and the ability to express our personalities through an article of beauty, style, and luxury are some of the elements of 'welfare' that we derive from the ownership of a private car. Car manufacturing has also been a crucial element in the development and growth of the economies of the highly industrialized countries. We can hardly imagine what our lives would have been like without cars, but how often do we look at the horrendous human, social, and environmental costs involved in the ownership and operation of cars? The sheer waste of resources used to make and operate the car; the amount of land

needed for roads and parking spaces; the personal, medical and environmental costs of car-related air pollution and noise; the human costs of deaths and injuries through accidents; the cost of time spent sitting in cars in traffic jams. We should also look at the fact that for production efficiency the companies which produce cars are now huge corporations that wield tremendous economic and political power. We should recall that car manufacturers have helped define the nature of work in our societies, as symbolized by the assembly line. We should also look at the loss of cheap and effective public transport that the mass ownership of private cars has brought about. The psychological results of the privatization of travel and its link with the modern experience of isolation is also very much worthy of serious consideration.⁵⁹ This is not what is running through our minds when we turn the ignition key. Would we stop if it were?

A second reason why we do not renounce economic growth is that we are caught in a system which threatens dire consequences on those who attempt to stop playing the game. A company which is in business, or just going into business will generally need to make capital investments in order to take advantage of a new market opportunity, or to increase its productive efficiency in order to maintain or improve its position with regard to its rivals. Since the money for the capital investment is usually borrowed, the company must make enough profits to both repay the capital and the interest.

There are generally three ways of making profits. One way is from the extra incomes that arise during a period of growth in an economy. These are profits that can be made without anyone else becoming worse off. A second way is by increasing one's market share at the expense of other companies offering a similar product or service. These profits are made at the expense of someone else, which is generally considered to be an undesirable social practice. The third way to make profits is by increasing prices. Since competitors are likely to do the same, interest payments can be funded through inflation. This third method is usually unworkable in an open, international market system since foreign companies may not feel the need to raise their prices.⁶⁰

For the business community, then, economic growth is not just desirable, it is absolutely essential for survival. Lack of growth in the economy results not in stagnation, but in a downward spiral of economic activity as the effect of cutbacks in new investment work their way through the economy, leading to recession, and in the worst case, economic collapse. Governments are equally affected, since the drop in tax incomes will come just as social security payments rise due to unemployment. The government can cut spending to try to keep its budget in balance, but this will only exacerbate the problem and drive the recession deeper. Alternatively, the

government may borrow money to pump into the economy, for example by means of public works projects, to boost demand and prevent the recession from getting out of hand, but this will increase the public debt.

Businesses and governments are thus caught in a 'growth imperative' from which they cannot escape, since to try to do so would result in recession, debt, unemployment and commercial disaster.⁶¹ The nation-state cannot allow this to happen. Any state that does will soon find itself slipping in the rankings of countries, laying itself open to internal collapse, disintegration, invasion, colonization, annexation, forced integration into the predominant system and so on, as described by Paul Kennedy in his landmark *The Rise and Fall of the Great Powers*, and as we have witnessed in recent years in China, the Soviet Union, Eastern Europe, and will no doubt soon witness again in the People's Democratic Republic of Korea.⁶² So crucial has the maintenance of economic growth become to the state that it is now the overriding role of governments and bureaucracies, virtually to the detriment of anything else.

One further way for a company to increase profits at the expense of others is to increase labor productivity. In this case the losers are the surplus workers and the rest of society who must bear the tax burden of unemployment benefit. There is nothing new about the notion that technological innovations that increase labor productivity (machines that need less people to operate them per unit of output) creates unemployment. In the advanced industrialized economies this effect was masked up to around the end of the 1960s by creating the unemployment elsewhere, among the craftspeople of the Third World, for instance.⁶³ Full employment was maintained while technological innovation raced ahead, creating growth and a rare period of increased quality of life with increased standard of living.

Japan is one of the very few countries which has managed to avoid falling into trade deficit and thereby maintain, until very recently, relatively low levels of unemployment. In the United States, average real wages began to fall in 1973. They have continued to fall since and the trend does not look like being reversed in the near future. In 1989, real wages had fallen to 20% below their peak in 1973. If it had not been for women entering the workforce (11 m between 1976 and 1986) family incomes would have plummeted, sending many more millions to join the already swollen ranks of the poor.⁶⁴

Korten gives an appropriate example of the changes that families go through under such circumstances:

Craig Miller was once a unionized sheet-metal worker for TWA. His \$15.65-an-hour job gave his family an income of over \$36,000 a year. With two cars in the garage and a swing set in the yard, they were a solid middle-class family living the American dream. Miller was laid off in the summer of 1992. He now hustles hamburger orders at McDonalds, drives a school bus, and has started a small business changing furnace filters. He gets home from his school bus duties at 5 P.M. After a hurried dinner, his wife leaves for her six-to-midnight job at Toys 'R' Us, restocking the shelves while her husband watches the children at home. She also works at the same McDonalds as her husband one day a week. Their total income from these jobs is \$18,000. They look to a bleak future.⁶⁵

The authors of *Beyond Oil* explain that economic growth has been dependent on two factors working in combination; knowledge and resources. For most of the last 200 years, knowledge has been the limiting factor, but very recently in the industrialized countries the declining supply, energy profit ratio, and efficiency of fuels have turned the tables on the advanced economies. The principal limiting factor of economic growth is now the resources required to implement our still-growing knowledge.⁶⁶ But since businesses will still continue to seek growth (and states to promote policies enhancing it) technological innovations will still be implemented, leading to the inevitable 'restructuring' of employment. People laid off from high-paying jobs in manufacturing industry are finding more and more that only low-paid, low-skilled jobs in the service sector are available.

The new high-tech companies of the United States, the "New Titans" of the Information Age (Microsoft, Intel, Apple, Novell, Sun Microsystems, and so on) whose combined share value greatly exceeds that of General Motors, Ford, DuPont, and Kodak, the old-style giants of manufacturing, create nowhere near the level of employment. Microsoft and Intel had a combined total of around 48,000 employees in 1996, compared with a combined total of 530,000 for Ford and General Motors in the same period. The New Titans are simply not creating enough new jobs for the 77.5 million (out of 114 million) "non-supervisory employees" in the American economy, resulting in a drop of real wages (in constant 1982 dollars) from \$8.40 per hour in 1978 to \$7.41 in 1994 as more and more of these people have had no choice but to take poorly paid service jobs.⁶⁷

In the three years between 1993 and 1996, the number of full-time and permanent jobs in the United Kingdom fell by 178,000. Temporary employment was up 300,000, and the number of people saying they were in part-time jobs because they could not find full-time ones was up by 175,000.⁶⁸ Ultimately, no one can benefit from

economic growth brought about by labor-saving technological innovation in a resource-constrained world. Some will gain for a certain period, but all are certain to be less well off as the ranks of the unemployed and disaffected grow, and the effects of decreased income for many work their way through the economy. Adam Smith's theory of the 'invisible hand' (self-interest working for the ultimate benefit of all) may have worked (or have appeared to work) during some periods over the last 200 years, but it has been shown to be highly ill-reasoned now. Mind you, Ned Ludd could have told you that in 1811.

One further related method of improving profit margins that has become popular in recent years is for businesses to relocate to areas where lower wage rates are in force, thereby reaping the benefit of lower production costs. Businesses in the advanced industrialized countries are relocating to The People's Republic of China, Thailand, Malaysia, Mexico, Brazil and other low-wage areas where working conditions may be little better than a form of 'modern slavery.'⁶⁹ Over the last decade, GATT (General Agreement on Tariffs and Trade) and its successor WTO (World Trade Organization), along with other groups committed to international free trade such as NAFTA (North American Free Trade Agreement), APEC (Asia Pacific Economic Council) and the EU (European Union) have enabled this process by progressively dismantling barriers to the international movement of capital.

When businesses relocate to low-wage areas, what they are effectively telling us is that unless wages and other conditions fall to the lowest common denominator—a "race to the bottom" by regions and countries—jobs will become increasingly harder to find.⁷⁰ International free trade will mean a leveling down where salaries and wages will converge to the level of the present Third World, but before that happens there is likely to be massive unemployment in the advanced industrialized countries.

A current symptom of this is the formation of a youth underclass in the countries of the EU. In the UK, out of a population of 1.7m young people aged 18 to 20, between 100,000 and 200,000 are "failing to take advantage of education, training, and employment opportunities." These young people leave school without qualifications, and may lack even the most basic skills to enable them to find a job of any kind. They have "low self-worth, little pride in their community, no hope for the future and feelings of rejection ...and feel they have no option but to turn to violence, crime, drugs and rioting."⁷¹

With the slow destruction of the state economies by the transnational corporations (TNCs) armed with their powers of a deregulated international trading system, social security provisions will come to be seen increasingly as an overhead which will have

to be shed in order for the advanced economies to compete with countries which heretofore could not afford such luxuries. Goldsmith argues that even before the global economy was formally institutionalized, the cost of monetized welfare was in many industrial countries growing faster than GNP, a situation that could not be sustained for long. The need to maximize competitiveness has now made it crucial for governments to phase out social security provisions just as the need for them is being dramatically increased by the deleterious social effects of economic globalization.⁷² The recent medical insurance reform in Japan where prescription rates for the aged were changed from a fixed sum per month to ¥500 yen per prescription, and the percentage of medical charges to be paid by an employed person rose from 10 percent to 20 percent is probably just a little taste of things to come.

The loyalty of businesses towards the people of specific locations and communities, and through this to the standard of living and quality of life of those people, has been shattered by a global system of business and finance out of control and which has lost touch with any sense of moral responsibility it may previously have felt. People with high standards of living are now regarded as an inefficiency which cannot be tolerated by global corporations in their race for market hegemony and riches. Paradoxically, the advanced industrial countries are now being cut back down to size by the Third World from whom they gained their riches during the rapacious era of colonialism.

Strangely, states do not seem to have woken up to the fact that by helping to implement economic globalization they may be doing themselves an irredeemable historic disfavor which will downgrade their existence to a mere technicality. It has been pointed out that the recent WTO agreements are highly undemocratic, removing decisions of vital importance to communities and countries to unaccountable bodies meeting in secret on another continent. It also seems likely that many of the democratically elected representatives of the countries which approved the GATT agreement of 1994 did not even read the text of that agreement.⁷³ More recently a Multilateral Agreement on Investment (MAI) is being prepared by the Organization for Economic Cooperation and Development (OECD). This "potentially most dangerous" of the international economic globalization agreements is intended to be "the constitution of a single global economy." As written, it will give TNCs the right to challenge any law that it feels restricts its ability to operate in any country or administrative region before an international tribunal. The outcome would be binding, and governments would enjoy no reciprocal rights to sue the corporations on the public's behalf. MAI would thus preempt any strategies by governments for restricting corporate flight to low-wage countries, enshrining in an international

agreement the legal right of TNCs to conduct business on their terms wherever and whenever they please.⁷⁴ What advantage there is in this for states and their populations is not at all clear.

Corporations, for their part, do not relocate because it brings gladness to their hearts to throw their employees out into the street. Korten has documented the case of the well-known clothes manufacturer Levi Strauss. The company has been hailed time and again for its social responsibility, ethical business practices, and "unprecedented commitment to nonexploitative work practices in developing countries." In June 1992, *Money* magazine ranked it first among all U.S. companies for employee benefits. In 1993, protesting against human rights violations in the People's Republic of China, the company ended \$40 million a year in production contracts in that country. When the company found that its contractor in Bangladesh was hiring full-time seamstresses as young as eleven, it worked out an agreement whereby the girls would continue to receive their pay and have all educational expenses covered while they went to school until they were fourteen.

In 1985, the Levi Strauss family privatized their company in a \$1.6 billion leveraged buyout specifically to prevent it being taken over by outside speculators. Despite efforts to keep as many of its production jobs in the United States as possible, Levi Strauss closed 58 U.S. plants and laid off 10,400 workers. It was later discovered that *Money* magazine had ranked the company number one on the basis of the benefits enjoyed by its headquarters staff, not by staff at its plants. The benefits received by production workers at a production plant in El Paso were found to be little different from those at other local textile factories.⁷⁵

The question that remains is: What would have become of Levi Strauss if the outside speculators had managed to gain control of the company? We do not know, but it is a fair guess that the speculators had identified the company as one that could improve its performance considerably (make handsome profits for its executives and stockholders) if it shed the "inefficiencies" of its ethical business practices. Levi Strauss appear to have succeeded in preventing the worst excesses of corporate behavior while still managing to produce clothes items and compete in the real world. The global world of finance is making it increasingly difficult to adopt this kind of ethical stance. It works largely not by creating wealth through efficient production, but rather by the extraction and concentration of wealth. Investors are comfortably shielded from the effects caused by the movement of their money and are rarely brought face to face with the human consequences. (A small minority of investors do nevertheless place their money with what are now know as "ethical investment" companies.) Fund managers can enjoy their expensive lifestyles and multi-million

dollar bonuses from behind their computer screens without having to worry too much about the unemployed, the small businessman who has been forced out of business, the indigenous people whose culture has been destroyed when the forest they lived in disappeared, or the lives that have been ruined by toxic effluent from a nearby factory, and so on, and so on.

Because the amounts of money involved are so huge, and incentives similarly great, the greed, but also the penalty for failure, is immense. The system demands that no opportunity for gain be forsaken lest it be quickly taken up elsewhere. With computers moving vast amounts of electronic money around the world instantaneously, there is not much time for morality when making split-second investment decisions. For every \$1 circulating in the productive world economy, roughly \$20 to \$50 circulates in the world of pure finance. Approximately *\$1 trillion* changes hands each day, compared with the \$20-\$25 billion required to cover daily trade in goods and services. If the world's central bankers could agree to coordinate a strategy to protect a certain currency from speculative attack, they might be able to muster a paltry \$14 billion between them.⁷⁶ The hard truth is that as corporations have delinked themselves from the human interest in their pursuit of expansion and hegemony, the institutions of finance have delinked themselves from both the human and the corporate interest. As Korten puts it:

Financial institutions that were once dedicated to mobilizing funds for productive investment have transmogrified into a predatory, risk-creating, speculation-driven global financial system engaged in the unproductive extraction of wealth from taxpayers and the productive economy.⁷⁷

The well-being of virtually every living entity on the face of the Earth is being endangered by a global financial Frankenstein which sees value only in the accumulation of virtual money blips on a computer screen. Human potential is wasted and moral behavior outlawed as the monster stalks the globe unsleeping in search of sustenance to feed its insatiable greed for intangible wealth, precipitating social and environmental catastrophe as it goes. Who could believe that such a system could remain sustainable for fifty years, let alone for a thousand or ten thousand future generations of humankind? Nobody, probably, but does anyone know how to stop it?

2.-3. Globalization and the World Food Strategy

The search for technological innovation through which to capture profits and drive economic growth is not occurring only in the information and electronics industries,

but also in such traditional sectors as agriculture. Genetic engineering biotechnology, the production of novel varieties of plants and animals by recombinant DNA technology, the technique that makes it possible to transfer genes between species, is now poised to bring about the biggest revolution in agriculture since farming began 10,000 years ago.

Great things are expected of biotechnology: Let's listen to what Roger Beachy, head of the plant biology division at the Scripps Research Institute and co-director of the International Laboratory for Tropical Agricultural Biotechnology (ILTAB) has to say:

We have a choice when it comes to feeding tomorrow's world. We can use up more land planting crops with marginal output, or we can use tools such as biotechnology to increase our yields and minimize the need for additional land for crop production.⁷⁸

Let's listen to what U.S. Secretary of Agriculture Dan Glickman has to say:

Well, we have a world population that in the next century is expected to grow at the rate of a New York City every month, a Mexico every year, perhaps even a China every decade. How do we feed all these people? We could continue ripping up fragile land and forests, and pump more pesticides into the ground. Or we could embrace the future—technology that allows us to dramatically increase yields, using less water and less pesticides, crops that can grow under harsh weather extremes.

In subsaharan Africa—where hunger is most epidemic—it is estimated that a doubling of the projected increase in grain yields over the next 10 years could cut the region's hungry by half—making a 25 percent dent in total world food aid needs.⁷⁹

There should be no doubt from the statements of the two distinguished gentlemen above that what we are talking about here is the role of biotechnology, genetically altered food plants, in bringing about an increase in yield of food (e.g. grain) per unit land area; land productivity. Agricultural land is scarce and will become more scarce in the future due to erosion, desertification, urbanization, and so on. There is precious little new land remaining to develop. The only way further increases in the human population can be fed is by increasing food crop yields.

In the last half century, as the population of the world more than doubled, grain

production has nearly tripled. This was made possible through the efforts of scientists and farmers who worked to breed high-yield varieties of grain plants, notably wheat and rice, and then implement the intensive farming practices needed to raise land productivity (the green revolution). This increase in the grain harvest necessitated the intensive use of chemical fertilizers and irrigation, and resulted in a number of harmful impacts, such as soil erosion, water resource degradation, indebted and discontented farmers, genetic erosion (loss of traditional varieties of food plants), and increase of loss of crops to pests due to the use of chemical pesticides to which many species of insects have developed resistance.⁸⁰

Interestingly, with the exception of irrigation (invented thousands of years ago), the technologies that have brought about 200-300 percent rises in land productivity since the middle of this century were all developed between 1840 and 1930. The discovery in 1847 by a German agricultural chemist, Justus von Liebig, that all the nutrients removed from the soil could be replaced in mineral form gave birth to the innovation of inorganic fertilizers. Gregor Mendel was doing his genetic research in the 1860s, the results being used to improve rice and wheat varieties in Japan in the 1880s before forming the basis of the green revolution in the 1960s. Corn hybridization was commercialized in the U.S.A. before 1930.⁸¹

Since, as a general rule, all the easy gains are made early on, making it increasingly difficult to make substantial gains later, there may be precious little improvement that can be made to plant physiology in the interests of increased food yield. There is now serious reason to believe that the gains to be had from alterations to plant physiology by biotechnological techniques may be small. Most growth in yields brought about by genetic breeding of new varieties has occurred through redistributing the share of the plant's photosynthetic product (photosynthate) which goes to the various plant parts (roots, stems, leaves, and seeds) so that a much larger share goes to the part we eat—in the case of grains, the seeds. Plant breeding has raised the percentage of photosynthate accruing to seed (the "harvest index") in grains from around 20 percent in the originally domesticated wheats to around 50-55 percent in modern high-yielding grain. This limit is thought to be around 60 percent, since the plant still needs an adequate root system, sufficient leaves for photosynthesis, and a strong stem.⁸² This does not leave much room for improvement by genetic engineering biotechnology.

One thing that plant breeders have not succeeded in doing is increasing the amount of photosynthate by a given leaf area, which remains unchanged from that of modern grains' wild ancestors; they have not been able to alter the efficiency of the basic process of photosynthesis itself. A breakthrough in this area has so far eluded genetic

engineering scientists, and is probably the reason why biotechnology has not yet produced a single, high-yielding variety of wheat, rice, or corn since research began in the 1970s. Unless this barrier can be breached, the remaining improvements that can be expected of biotechnology tend to be rather minor, for example raising plant tolerance to drought, soil salinity, and other environmental stresses.⁸³

Differences in grain yields between different countries and regions of the world tend to suggest that there is still a large potential for yield increases to be gained through conventional agronomic improvements, irrigation, use of fertilizers, more effective control of diseases, insects, and weeds, and so on. The possibilities here have been investigated by Lester Brown and reported by him recently. According to Brown, regional differences in rainfall, growing season, solar intensity, soil quality and so on make it unlikely that any great yield increase is obtainable in this area. For the specific case of wheat, Brown states:

In almost every place where wheat is produced, in developing countries as well as the highly mechanized ones, the historic rise in yields is slowing.⁸⁴

The trend for rice and corn is said to be similar.

In spite of the fact that biotechnological innovations will probably not bring about a substantial increase in food plant yields, almost certainly not on the scale of the 200 to 300 percent rises of the past half-century, and in spite of the highly tenuous link between yields and the elimination of poverty and hunger, agribusiness TNCs and governments continue to insist on their promotion. The reason appears to be the profits that can be made from the marketing of patented genetically engineered plants and animals. The European Commission, for example, identifies biotechnology as one of the three key technologies for future European economic growth, competitiveness and employment.⁸⁵

The legal history of the patenting of altered life forms is well documented⁸⁶. The outcome has been, notwithstanding some important revisions in the past few years⁸⁷, that it has become possible to patent any genetically altered plant, bacteria, animal or human parts, and in some cases complete animals. These patent rights have been enshrined in the 1994 GATT agreements as Trade-Related Intellectual Property Rights (TRIPS), and this has effectively made it necessary for all countries party to the GATT agreements to accede to the western view of patent rights. Stiff resistance to this movement has been forthcoming from the countries of the South, particularly India, although the general trend has been for governments to bow to GATT-WTO and Northern pressure against the will of their populations.⁸⁸

Patent laws have made it possible for innovative biotechnology companies to literally raid the 'developing' countries (where most of the remaining biodiversity exists) of their promising genetic resources. From these are isolated useful genes which can be inserted into the DNA of existing, say, fruit, vegetable, and grain varieties to make a marketable plant with some new, appealing trait, such as size, longer shelf life, heat tolerance and so on. A license is required to grow the new variety, thereby generating royalties for the company that developed the genetically altered plant. If the new plant is popular, this could result in quite stunning profits.

The giant of engineered foods Monsanto, which now owns W.R. Grace, a leader in the patenting of genetically altered organisms, received a European patent in 1996 for a soyabean into which a gene making the plant resistant to Monsanto's glyphosphate weedkiller, Roundup, had been spliced. Roundup is Monsanto's best-selling herbicide, providing 40 percent of its operating profit. The patent on Roundup runs out in the year 2000. But by use of the new genetically altered soyabean, Monsanto would retain control over farmers' use of Roundup, *and* gain royalties for the seed for each planting, since farmers would be prohibited from saving seed from one harvest to the next (at least for the length of the patent, which is at least 17 years). It is estimated that 80 percent of all U.S. soyabean exports could be grown using Monsanto's genetically engineered seed by the year 2000.⁸⁹

If agribusiness TNCs have their way, seeds will thus cease to be a product of nature which can be freely saved, used, given as gifts or exchanged, but will become a patented commodity. The Secretary General of the industry association of corporate seed houses and breeders has said:

Even though it has been a tradition in most countries that a farmer can save seed from his own crop, it is under the changing circumstances not equitable that a farmer can use this seed and grow a commercial crop out of it without payment of a royalty... the seed industry will have to fight hard for a better kind of protection.⁹⁰

The myriad ethical issues arising from such developments are well-documented in the sources given. Consider, for example, that a very few TNCs and governments might own the entire human genome, thereby realizing the corporate enclosure of our genetic commons. Implicit in this is a scenario for a form of genetic slavery analogous to the slave trades of past centuries.⁹¹

Environmental issues of genetic engineering are another matter which can be dealt with only very briefly here. Firstly, we really do not know very much yet about the

way genes work, let alone understand all the ramifications of gene-splicing between species.⁹² Secondly, the transfer of genes between plants in the field is known to occur, but is not well understood in terms of its likely future consequences.⁹³ What has been learned recently is that horizontal gene transfer takes place far more often and between far more varied ranges of species, and that DNA is rather more robust in the environment than previously thought. The possible occurrence of human genetic disturbance, or the generation of new disease-causing viruses (already said to be appearing) is thus much higher than was thought until very recently.⁹⁴ Thirdly, despite the usual pledges of rigid safety controls from companies dealing with transgenic materials, mistakes have been made, and will continue to be made, leading to totally unpredictable consequences.⁹⁵ Regulatory bodies, crumbling under pressure from industry to relax regulations, have failed to take the new findings into account. Safety regulations are now being whittled away just as we really begin to find out what dangers may really lie ahead.⁹⁶ A long, hard look at all aspects of genetic engineering needs to be undertaken to appraise the realistic human advantages of this technology before we go rushing off down the road to increased profits and economic growth. The growth imperative, however, suggests that nothing of the sort is going to happen.

Further, biotechnological innovation will also have a redistributive effect on employment, driving activities from the farm to the nonfarm sector, perhaps even making full-time farming obsolete.⁹⁷ An example of this is the development of a process for producing vanilla in commercial quantities in laboratory by two U.S. biotechnology firms. The genetically engineered vanilla sells for less than \$25 a pound, whereas the natural vanilla is priced at around \$1,200 a pound on the world market, due to the difficulty of pollination, harvesting and curing natural vanilla. One-third of all ice cream sold in the United States is vanilla, and 98 percent of the world's vanilla crop is grown in the island countries of Madagascar, Reunion, and Comoros. The factory production of vanilla is likely to spell economic catastrophe for these Indian Ocean island economies. Over one hundred thousand farmers are expected to lose their livelihood over the next several decades.⁹⁸

Let's listen this time to what U.S. Secretary of Agriculture Dan Glickman has to say about global food security:

To meet our goal of halving the world's hungry and undernourished by 2015, we've got to get at the root causes of hunger—poverty, income inequality, political instability and related issues. Internationally, change must start from within. Leaders of hungry nations have got to enact the democratic and free-market reforms necessary to stabilize their countries, serve the needs of their people, and strengthen their economy and infrastructure. Without these

changes, we've seen time and time again that there's little the outside world can do to help.⁹⁹

Leaving aside the simple doubt concerning the morality of why we should be striving to eliminate only *half* the world's hunger and undernourishment over the next twenty years or so, it would appear from this statement that free-market reforms play an important role in the solution to world hunger and poverty. Oxfam's Kevin Watkins shows how free-market arrangements, as enshrined in the 1994 GATT agreements, are likely to lead to increases in poverty and hunger in the 'developing' world in "a recipe for social, economic and environmental dislocation."¹⁰⁰

Briefly, Watkins shows how the Northern governments (principally the United States and the European Union) have contrived to write the GATT 1994 agreements in such a way as to preserve their ability to subsidize their food production (and thus ensure that they will continue to produce huge surpluses for export) while at the same time getting 'developing' countries to ease restrictions on the import of food. The U.S. and EU will thus continue to dump increasing volumes of grain on world food markets at artificially depressed prices. This will lock smallholder producers in the South into highly unequal competition with the industrial farming systems of the North. As cheap food enters the market of the 'developing' country, these small farmers will be unable to sell and some will be driven off the land into the cities, destroying the local food producing capacity.

The governments of the North say that the Southern countries should reap the benefits of comparative advantage by meeting domestic demand for food by importing cheap supplies from the North while using their land to grow more valuable cash crops, which they can then export to the North. In fact, the production of these cash crops, typically (genetically engineered?) fruit, flowers, and vegetables, is dominated by large-scale commercial farms in irrigated areas. The poor quality and sloping fields of the smallholders are simply not able to engage in this kind of production in a competitive way. The large-scale commercial cash crop farms also do not provide regular, full-time employment for the displaced farmers, being usually temporary and/or piece-rate employment. This, of course, severely restricts income, and the access to food, resulting in poverty and hunger.

No matter how much food may be available on the market, without the cash to buy it people will go hungry. Far from meeting the needs of poor people and eliminating hunger, free-market reform has, and will continue to, result in a worsening of conditions for the world's poor as long as elite interest is allowed to make up the rules of the game as it goes along. The confluence of elite interest in this case being

Northern governments wanting outlets for surpluses; corporations wanting access to Northern surpluses for export to 'developing' countries; and Southern governments wanting cheap food for cities.¹⁰¹

Watkins describes a family living in northern Mindanao, in the southern Philippines. The family farm is just under two hectares of land, one hectare of land to white corn and most of the remainder to yellow corn. There are two harvests a year (in February and August) and the white corn is sufficient to meet the family's food needs for about five months. The yellow corn yield is two to three times higher than the white corn as the family use fertilizers to grow it. The entire yellow corn crop is sold to traders. The family derives about 80 percent of its income from these sales. They are able to buy twice as much white corn as they could have been able grow, as well as some rice. But as yellow corn prices fall due to the removal of trade barriers and an increase in imports, the family's income will drop, and with it their ability to sustain themselves.¹⁰²

It is through this and similar mechanisms that the TNCs, driven by the world financial system, supported by Northern governments, and with the backing of the legal might of the WTO, will further impoverish the poor of the 'developing' world, and create massive dependence on imported (probably genetically engineered) food. The decline of local agriculture will result in genetic erosion, making it that much harder to return to a non-chemical, sustainable agriculture in the future. The aim of the agribusiness TNCs is undoubtedly the disappearance of local varieties, relegated to a few disintegrating specimens in Northern seed banks,¹⁰³ and the universal application of their genetically engineered products, requiring, of course, their chemical weedkillers, fertilizers, and pesticides, and all the other paraphernalia of capital-intensive industrial agriculture. To allow this to happen would be to stand by while a disaster of unimaginable global proportions unfolds before our eyes.

It may still be possible to avert the global growth and free-trade disaster, but first *we've got to get at the REAL root causes of hunger* in order to understand just exactly what dynamic is at work here.

Part Three: As You Sow, So Shall You Weep

3.-1. Who are we?

Man is nothing if he is not a great storyteller. How could we live without the conceptualizations of who we are, where we are, how we got here, or where we are going? From the socio-linguistic schemata we use to guide us through the brief

interactions we make with others fifty times a day, to the magnificent constructs of the great religions and philosophies, we carry them all around in our minds as stories that whisper in our inner ear, help us keep our bearings (or lose them) with the world around us, and guide us towards certain modes of behavior and away from others. They are our myths, our beliefs, our values, our customs, our morals, our folklore, in short our total inner culture. The problem is that almost all of it is *unconscious*. We know precious little about the content of our culture, which has been the basis of human action throughout the centuries, nor where it came from. Like the best of secrets, it is written in letters a yard high on our billboards, but is quite unknown to the vast majority of the human race.

So where did our culture originate and what does it consist of?¹⁰⁴ We are pretty sure that humans were already what we would recognize as humans about three million years ago.¹⁰⁵ Until the Neolithic 'agricultural revolution,' which occurred around 10,000 years ago, humanity lived what is generally known as a 'gatherer-hunter' lifestyle—a true nature-based lifestyle. Stereotypically, the gatherer-hunters lived in small, mobile bands, the men hunting animals for meat and hides, while the women (and presumably the children) gathered wild food such as fruits, nuts, grains, roots, vegetation, and so on. In fact, it is extremely difficult to describe the gatherer-hunter lifestyle, since there have probably existed thousands of variations depending on the availability of different kinds of food sources, the climate, the geographic setting, and so on. Women are known to be hunters, for example, in certain Inuit groups, and among the pygmies of central Africa women help with the hunt by driving animals into the nets, where they are captured or killed by the men.¹⁰⁶

Around 10,000 years ago, agriculture began to appear in the fertile crescent of southwest Asia, stretching roughly from what is now Palestine and Syria to the Zagros mountains of Iran, and including the valleys of the Tigris and Euphrates rivers.¹⁰⁷ This was not a revolution in the sense that there was a very short period when people suddenly changed from doing one thing to something totally different, but rather of a very slow transition in lifestyle towards sedentary farming requiring thousands of years.

We do not know exactly how or why this happened. Agriculture later developed along the tributaries of the Yellow River in north China around 6,000 BCE (Before the Current Era) and in Mesoamerica (what is now Guatemala, Belize, and parts of Mexico, Honduras and San Salvador) from around 5,000 BCE,¹⁰⁸ and so we can be reasonably certain that humanity will devise ways of manipulating the environment to their advantage and invent agriculture wherever the climatic and environmental conditions permit. One thing that is fairly certain is that agriculture made it possible

to produce more food per unit area of land, and therefore may have arisen as a response to population pressure. Another point is that agriculture makes possible the production of storable surpluses of food. In other words, agriculture made it possible for people to exceed the natural carrying capacity of the land.

As with gatherer-hunter peoples, agriculture can appear in many different forms, but what concerns us here is that a *certain form* of agriculture, termed '*totalitarian agriculture*' by Daniel Quinn,¹⁰⁹ associated with a *unique culture* arose, we surmise, around 10,000 years ago in the fertile crescent of south-west Asia. The different aspect about these people (we do not know their name) is that they were successful in encroaching upon the lands occupied by other peoples around them, and inducing these people to take up agriculture, take on the culture of the invaders, or else vacate the land. In other words, these new people were powerful and expansionist. Their power may have stemmed from having a larger population and a greater ability to fight due to more reliable food supplies, but to be expansionist requires at least some kind of cultural trait equivalent, perhaps, to an ideology.

What these people believed was that they were *right*; that they had found the one right way for people to live. This totally new vision, coupled with the power of an unprecedented food producing system, gave these agriculturalists an unassailable advantage over neighboring groups, whom they were able to take over or push further and further out towards the periphery. This represents the birth of our civilization and our culture. Food surpluses result in division of labor (as not everyone now has to be engaged in the production of food for the group to survive), which in time will result in larger settlements, leading to towns and cities, and all the 'overheads' of civilization such as ruling elites, bureaucracies, standing armies, commerce, priesthoods, and so on.

This new civilization, and every civilization that it has spawned since (and we are now in the realm of history as it is known from archeological and written record), was based on the above vision that they had found the one right way to live. The worldview that this vision engenders is exclusive not only in the sense that insists that all other *people* should adhere to the same belief, but also in the sense that it is virulently *anthropocentric*. 'The world was made for us, and we were made to conquer and rule it' is its central tenet. In effect, this states that we are the *pinnacle of creation*, the *final end-product of evolution*, and that we must *fulfill our destiny* by conquering nature and rearranging the planet until it becomes the ideal home for us, humanity. An explanation for the immense popularity of the 60s TV series *Star Trek* is possibly that it implies that the *meaning* of the planet Earth is to be our cradle and the launching pad from whence we go boldly forth to conquer the whole wide

universe.¹¹⁰ This is our culture's *creation myth*, and the story we tell ourselves every waking day of our lives, in our minds and now through our mass media, and is the fundamental basis of our thought and decision-making (and thus actions), whether it be the smallest detail of our daily life or a decision affecting the future of millions of people, other living beings, or a large ecosystem.

Here is an example of what I mean:

By now it should be clear that our environment is becoming ever less capable of sustaining the growing impact of our economic activities. Everywhere our forests are overlogged, our agricultural lands overcropped, our grasslands overgrazed, our wetlands overdrained, our groundwaters overtapped, our seas overfished, and nearly all our terrestrial and marine environment is overpolluted with chemical and radioactive poisons.¹¹¹

Who do you think the writer of these words is? A worried corporate executive? A fearful fund manager? Tony Blair? Al Gore? None of these; this is the opening of a chapter of a recently published book by one of the most respected intellects and campaigners for ecological wisdom of our age.

3.-2. Why Can't We Even Feed Ourselves?

In order to maximize us, it has been necessary to maximize food production by expanding onto new land (this process being not quite completed yet) and raise productivity by all means at our disposal. It follows then that all land is our land, and that all food is food for us, and ultimately exclusively food for us. In short, our worldview entails (demands) the extermination of all competitors and the right to reserve to ourselves the power to decide who (or what) lives and who (or what) dies. In modern ecological parlance, we are sacrificing diversity for the sake of just one species. We are also locked into a mindset of unlimited growth. Both of these problems we instantly recognize as being at the very core of the ecological disaster that threatens the very existence of mankind, as it has already resulted in the extermination of countless species by the economic activity of humans during this millenium.¹¹²

The population of gatherer-hunter societies increase at very slow rate. It is estimated that the population of the world was approximately five million at the beginning of the Neolithic age. Three million years to reach a population of five million. The annual population growth rate up to that time was 0.01 to 0.005 percent.¹¹³ There are several reasons why gatherer-hunter societies do not grow quickly. Firstly, they are limited by the carrying capacity of their habitat. If they exceed it, the environment

will be degraded, making less food available, resulting in a decline in population—negative feedback.¹¹⁴ Often, they are not able to migrate to another area as that is already occupied by other groups who will resist the migration into their territory. Migration is sometimes impossible or difficult because the migrating group does not know *how* to live in any other environment than the one it has traditionally inhabited.

Fertility control factors are also at work. Foraging women carry their children with them at all times and feed them on demand for as long as four years. This can trigger the secretion of a pituitary hormone that suppresses the mother's menstrual cycle. Other factors, such as the high-protein diet of the gatherer-hunter women, and the lean body which results from strenuous demands of walking and carrying heavy loads, lead to a late onset of menstruation as well as extended periods when the blood cycle disappears. Fewer periods and irregular cycles are also experienced by modern women athletes. A gatherer-hunter woman may therefore expect to give birth once in approximately five to seven years.¹¹⁵

Tillers of the soil are quite different. They can increase their food production at will, and so have no incentive to suppress fertility at all. A greater population simply means that a greater area of land will come under cultivation. The population will then rise, followed by an increase of cultivated land area. The population will then increase so that you have a very nice positive feedback system running away with itself. From this point on, the tillers probably could not have controlled their population even if they had wanted to.

Archaeological evidence suggests that the spread of sedentary communities in the Near East brought with it a 700 percent population increase. The demanding agricultural work required of women under the new system made it difficult to carry a child throughout the day, though that was no longer necessary since living in one place meant that a child could now be kept in a pen or a room built for that purpose. Women slowly began to discontinue the lengthy period of breast-feeding, which would result in postpartum ovulation returning sooner than in gatherer-hunter lifestyles. The change in diet associated with the agricultural regime, a high-carbohydrate diet as opposed to the previous high-protein diet, caused women to be less lean, to store more fat on their bodies, and therefore have more regular blood-cycles. A healthy woman of child-bearing age might now be giving birth once every year or two years, families of eight or ten children becoming common.¹¹⁶ The rate of population increase slowly began to rise, and the population rat-race was on. This is literally the point at which our culture jumped off the precipice into *free-fall*.

Widespread human famine is a product of agriculture.¹¹⁷ Totalitarian agriculture has

enabled humans to ignore the laws of ecology and allow their numbers to exceed the carrying capacity of the land. When for some reason, a degraded environment or lack of rain for example, results in a large food shortfall famine occurs. In the modern era, we would then rush in more food in order to sustain the population so that the next time famine occurs there will be the same number or more people to suffer. True nature-based people, traditional gatherer-hunter societies, rely on a variety of food sources. The likelihood of all of these failing simultaneously is very small, thereby making widespread famine a rare event.¹¹⁸

Interestingly, as noted above, some areas of the world have achieved the dual virtue of both population stability and food surplus. Western Europe is the main example. Housing shortages, the role of women in society (especially the rise in female employment), the loss of social meaning of a large family, the easy availability of a range of contraceptive methods, and other social and medical factors have brought about this reduction in the population growth rate.¹¹⁹ But the population of the world is still rising by 90 million people annually. That can only mean that surplus food from Europe, North America, Argentina, and so on is going to feed the population increase in the parts of the world which do not produce enough food, and yet where population is rising. It cannot be otherwise simply because the population could not rise unless the food were available. Exports of surplus food (or land and labor productivity increases in the production of food) therefore contribute to the population explosion, not to the relief of the hungry.

It is also noted above that poverty and hunger are partly the result of skewed power relations.¹²⁰ Poverty exists amidst abundance in every 'developed' country simply because some are unable to buy what they need. A similar situation exists in 'developing' countries, where even in times of widespread famine there is plenty of food available *on the market*, but people who need it cannot gain access to it because they do not have the money, and therefore starve unless food aid arrives. The food aid is more than likely to be surplus grain exported from Europe or North America; the factor pushing the people over the brink of poverty may also have been the import of that same surplus grain from the same countries, made possible by the forced deregulation of the markets under GATT/WTO trading rules.¹²¹ There cannot be much doubt left that increasing food production will not result in the elimination of poverty and hunger. Making contraceptives more easily available, for example, while continuing to increase the supply of food are guaranteed to have only extremely marginal effects on Third World hunger and poverty.

As a generalization, we can say that our cultural vision of the domination of the Earth has brought about the need for man to dominate man in order to fulfill his

cultural destiny. Bookchin has indicated that the two forms of domination (man-man domination, man-nature domination), as we see here, are mutually reliant and are unlikely to cease unless both, all domination, are eliminated.¹²² Marxism is unrepentantly anthropocentric in that it envisions a world where man lives in an egalitarian society where he is the master of nature.¹²³ This is a mirage. Bookchin is only partly correct when he says that the origins of the ecological crisis are social; that they are produced by people and the societies they live in. More fundamentally, the origins of our ecological crisis and human power unbalances lie in our culture. A resolution of all these issues can only come about when large numbers of people come to a clear awareness of the cultural story that is the deep undercurrent to our present predicament.

3.-3. What's Wrong With Us?

The free-fall culture, the 10,000-year-old agricultural revolution and its attendant culture, has burdened us with far more than the population-food positive feedback system. Living in one place brought with it fundamental changes in lifestyle. Sturdy housing and storage facilities would have been built, and for the first time people would have owned more than they could carry around with them on their backs. These developments would eventually lead to the emergence of private property and the class stratification of society.¹²⁴

New technological innovations began to appear, such as the plow to cultivate the ever-expanding croplands, and irrigation systems to bring water to the growing crops. Each innovation and development led to society becoming more complex, more specialization of labor and further stratification occurring with the birth of villages, towns, and then cities. Each change that occurred set off adjustment processes in terms of personal and social reaction, leading in turn to further technological innovation, the interaction of technological change and human adjustment spiraling ever-upward towards the overwhelmingly technologized society of recent centuries.¹²⁵

As our culture jumped into the free-fall of unrestrained population growth and technologization, the break with the past, although not 'sudden' by our modern standards, taking several thousand years to become strongly entrenched, the shock to the human psyche was devastating. Assuming the appearance of humanity to be approximately three million years ago, this time would span something like 120,000 generations. The last ten thousand years since the beginning of our culture represent 400 human generations. The time before our culture began was 99.5 percent of humanity's time on Earth. Refusing to recognize the worth of any human existence or

activity prior to about ten thousand years ago has left us with a gaping void in our psyches to which we have been unable to make the necessary personal and psychological adjustments. In spite of defining ourselves by our self-centered culture, we have, not surprisingly, been unable to neutralize the accumulated cultural wealth of 99.5 percent of our existence.

How do we explain the deep inner feeling of satisfaction and contentment we get from sitting around a table for a family meal? Or enjoying a barbecue with a few other families? Or hiking? Or travelling? Or shopping? Why are women attracted to small, shiny objects? What pleasure is there in fishing when you can buy all you like at the supermarket? Why can people not stay in one place day after day, but need to get out into the open and seek companionship with others? We are who we always were, but with an overlay of a new and ultimately self-destructive culture which has been progressively more harmful to the human psyche. Our culture and society are not the ones in which we evolved and developed for over 99 percent of our existence. Put another way, our culture and the technological civilization that has grown from it has robbed us of the central experience human beings have shared for over 99 percent of our time on this Earth.¹²⁶

What might this 'central experience' be? Simply, it is an overall sense of connectedness to the Earth, a sense of personal integrity, centredness, and capability, a feeling of trust and faith in nature, and a sense of belonging and security in the world.¹²⁷ This abstraction is the one common feature of all true nature-based human societies in the world.¹²⁸ The stunning thing is that we do not have to rely on printed accounts of nature-based peoples far removed in time and space to get an idea of what these experiences are about, we are all able to experience them for ourselves, and in fact do every day, but are unaware of their meaning and origin. But we *have* come close to isolating ourselves from what is possibly a huge and important area of inner existence; the so-called non-ordinary states of consciousness, the transpersonal, the intuitive and the truly vast world of dreams and altered perception open to humans with their massive surplus of mental capacity.¹²⁹ It is perhaps as the invention and global spread of totalitarian agriculture has been "the worst mistake in the history of the human race,"¹³⁰ the greatest misfortune over the last five centuries of the Age of Reason has been the corralling of 'inconvenient' perceptive capacities into the inner recesses of our minds.

Signs of our psychic distress are not hard to find, either in history or in our current everyday lives. We have a recorded history of 6,000 years of war, crime, corruption, rebellion, famine, plague, slavery, genocide, and economic collapse to choose from. The global history of the 20th Century should not leave anyone in doubt that

humanity is experiencing both physical and psychic distress. It has also become clear in the last few decades that our military and economic activities are beginning to push against the limits of the Earth's life-sustaining systems, particularly the ability of the Earth to disperse and neutralize the waste products of human activities. Further, the last four decades have seen the emergence of one further sign of distress, one that we know very well, but have been almost totally unable to deal with or understand. This is the 'cultural catastrophe'—a loss of vision, failure of purpose, and a collapse of values,¹³¹ particularly in those born during or after the 1960s.

Al Gore talks of the "our deep loneliness" and psychic "pain of what we have lost; a direct experience of our connection to the vividness, vibrancy and aliveness of the rest of the natural world."¹³² In our 'age of alienation,' where humanity has become estranged from itself and from the natural world,¹³³ we have become "the prisoners of greed and the prisoners of envy;" "prisoners of an abstract economic system that works only through our dissatisfaction and anguish."¹³⁴ "Strange new forms of poverty"¹³⁵ have arisen in "the ruined and trampled spaces within,"¹³⁶ which we are exhorted to cover over and soothe through the self-indulgence of consumerism. Poverty, we are told, can be eliminated only through wealth creation, but this leads only to the reinstatement of poverty in a different form and at a higher level. The system needs poverty, just as poverty needs the system, for what purpose would wealth creation serve if poverty were truly eliminated, as it could be if that were our real intent?¹³⁷ It is as E.J. Mishan suggested in 1976, that our culture has jumped off a hundred-storey building. Things will be fine for a while. We can congratulate ourselves on having successfully created material abundance through a cultural vision that flies. The further we fall the more confident we become until, as we pass the 99th floor, the confidence of the high priests of the technocracy reaches a maximum.¹³⁸ In fact, the leading edge of our culture is just now striking the pavement below.¹³⁹

Chellis Glendinning tells us that in today's mass technological society, the traumatizing process is constant and chronic, and we have almost lost the knowledge and the means to heal from the onslaught.¹⁴⁰ Instead of recognizing the impasse we are in and trying to find a way out, the technocracy has engaged in deep denial while setting up 'rational' structures of power to try to keep the populace in line.¹⁴¹ These invented laws are little more than crude contrivances to attempt to keep in check new phenomena that have arisen as a result of population growth and technological innovation. For 99.5 percent of human history there were no written laws. Each culture had its compliment of myths, legend, song, ritual, taboo, and morality—in short its 'laws' and its accumulated wisdom for survival of the group. These developed for each culture over thousands of generations, and they worked. We

know they did, because here we are now! When totalitarian agriculture spread across the Earth, all other cultures were effectively swept away in its path. Even the 'laws' of the culture of the original inventors of totalitarian agriculture are thought to have become obsolete due to changed social and environmental conditions, leaving us finally with no choice but to invent laws, no longer having the leisure to allow them to develop by trial and error over hundreds or thousands of generations.¹⁴²

The emptiness, the despair, and the futility of our modern technological civilization is widely acknowledged. The myth of endless progress towards a technological utopia has been exploded. Only the technocratic leadership now deny this, which is why they fail to understand the reason for fewer and people bothering to go to the polls each year.¹⁴³ The young especially understand this intuitively, and constantly attempt to escape into dark worlds of excessive material consumption or spiritual cynicism. The much-despised and little-understood punk subculture is perhaps one of the clearest expressions of social frustration and trauma. The mainstream culture has literally marginalized them for telling it as they see it: It ain't working; there is no hope, we have no power, there is no future.¹⁴⁴

Part Four: Brief Glory or Dull Obscurity?

It should be clear from the above that we must, at the very least, consider how we can alter our lifestyles to create sustainable societies which could eventually learn to live in balance with the natural systems of the Earth. How can we best approach this problem? What can we do right now? How can we prepare to make the necessary changes? What might be the paths to the 'sustainable societies' of the future, and what might they look like when we get there? But firstly, what can be done about the sticky problem of world population increase?

4.-1. Rethinking Population

Demographics is now a highly controversial field. The recognition by almost everyone that too many people on the planet is now causing, or will cause before very long, serious problems has led to a massive effort in recent decades to try and 'control' population increase. The efforts have been driven for the most part by two theories of population control, namely 1) that contraception can slow population growth, and 2) that 'development' (improvement in health and sanitation, improvements in education, better access to food, industrialization, urbanization, and economic growth, etc) will bring down population growth rates.¹⁴⁵ Both have been shown to be effective to some degree in the real world. However, as noted above, since the main effort has been directed towards symptoms and not root causes, the

effects have been marginal, and the results far from beneficial to the vast majority of people.

China's experiment with the one-child birth policy has been instructive. The one-child policy was introduced in 1979, following a fairly successful campaign for later marriages, fewer births, and longer intervals between births initiated in 1972. This campaign had brought the TFR in rural areas down from 5.50 in 1972 to 2.97 in 1978, and in urban areas from 2.64 in 1972 to 1.55 in 1978. However, fearing a further giant upsurge in the population as the postwar babies began to reach marriageable age, the Chinese government thought it necessary to introduce more drastic measures. The main features of the one-child policy have been 1) the quality and thoroughness of distribution of contraceptive devices, 2) the range of incentives and disincentives for adhering to or failing to adhere to the policy, 3) a bureaucratic control system capable of reaching down to and controlling the actions of individual citizens.¹⁴⁶

Recent figures suggest that, despite partial failure due to cheating, corruption, change in economic relations, and the deep-rooted cultural desire of rural Chinese to have at least two sons,¹⁴⁷ the one-child campaign has been remarkably successful. In 1996, the natural growth rate was 1.042 percent. At the end of 1996, the total population of China was 1.22389 billion, an increase of 12.68 million over the figure at the end of 1995.¹⁴⁸ The UNDP *Human Development Report 1996* shows China's 1992 TFR to be 2.0 and the total fertility index to be 37 (1970=100).¹⁴⁹ Although there is still some way to go before population growth is halted, progress towards that goal is being made.

But wait a minute. The UNDP 1996 Report also gives the following figures:

| Country | Total Fertility Rate (1992) | Total Fertility Index (1992, 1970=100) |
|-------------------|-----------------------------|--|
| Thailand | 2.1 | 38 |
| Republic of Korea | 1.7 | 39 |

UNDP, *Human Development Report 1996*, p.154

Neither Thailand nor the Republic of Korea have one-child birth control programs, so how was their fertility rate decline achieved? Presumably by 'development' or a combination of 'development' and contraceptive use. As seen above (Part Two) the fertilities (population growth rates, provided immigration is not significant) of industrially advanced countries do tend to fall, and this should eventually lead to population decline.¹⁵⁰ If so, as made abundantly clear in the UNDP 1996 Report, growth is thus the 'answer' to the world population problem. The Report is at great pains to point out that appropriate forms of growth, growth with equity and the

empowerment of women, are necessary, and even how fast that growth might be, but it is still growth.¹⁵¹

If the population of the world is to stabilize by becoming 'developed', then presumably it must 'develop' to the level of Japan or Germany for this to happen. Daly has calculated that for the whole world to consume resources at the current U.S. level (admittedly excessive) world resource flows would have to increase sevenfold.¹⁵² Daly also uses the work of Vitousek et al to show that human appropriation of the net primary production (NPP; the amount of solar energy captured in photosynthesis by primary producers, less the energy used in their own growth and reproduction) of the Earth by humans is about 25 percent overall, or about 40 percent if only terrestrial NPP is considered. Taking the lower figure, a fourfold increase in the scale of the human economy will take us to 100 percent, leaving no energy left available for nonhuman species. Since humans cannot live without the services of ecosystems consisting of other species, a fourfold increase in human economic activity must be an ecological impossibility.¹⁵³ Even if we were to allow that economic growth might be able to slow population growth, despite all that we have said concerning the doubtful benefits of economic growth in Part Two, the physical limits of the Earth are likely to be reached long before 'development' has the desired effect.

Only one area in the 'developing' world is well-known for having stabilized population growth while remaining at relatively low income levels (with the exception of nature-based societies, that is). Kerala, a state in southern India with a population of 30 million people,¹⁵⁴ has seen its TFR fall from 3.0 in 1979 to 1.8 in 1991, "even though the area has remained very poor."¹⁵⁵ India's TFR was 3.8 in 1992.¹⁵⁶ Various factors are at work here, but the central point is that Kerala's socialist government has consistently worked to redress unbalanced power arrangements by empowering the poor, particularly women. 87 percent of women are literate, two and a half times the all-India average.¹⁵⁷ Infant mortality is half the Indian average, farmworkers are effectively organized and their wages are relatively high, male life expectancy is 10 years and female life expectancy is 15 years above the Indian average, agrarian reform and improvement in the status of the lower castes has improved the lot of the poorest people, and the public food distribution system is reckoned to be the best in India. Kerala also has a population density three times the average for India, but is only about 50 percent self-sufficient in food.¹⁵⁸ For historical and climatic reasons the state has developed commercial agricultural rather than food crops. In 1992-93, only 23 percent of the gross cropped area was used to grow food crops (cereals, millets, pulses and tapioca). Kerala produces 92 percent of India's rubber, 70 percent of its coconut, 60 percent of its tapioca and almost 100

percent of its lemon grass oil. Kerala is also the single largest producer of a number of other crops like banana and ginger.¹⁵⁹ The reason why Kerala's population has very nearly stabilized (the annual growth rate is about 1 percent) is that the state government has, over the years, redressed the maldistribution of survival resources (land, jobs, food, education, and health care) to the point where the poor majority have the security and economic opportunity necessary for them to *choose to have fewer children*.¹⁶⁰ It is possible that local shortage, but fair distribution, of food has had an effect on fertility once policies aimed at income and power distribution had been put into place. What is most important is that this is an example of a society which, through sensible and humane social and economic policies, has been able to live close to a material balance with nature without the constant specter of mass famine.

In China and India, in particular, the attempt to control the effects of population growth by direct forms of population control (contraceptive devices and drugs, sterilization, and abortion) have been very heavily relied upon. These policies have tended to focus on women, and frequently have strongly persuasive or coercive overtones. Forced abortion to terminate 'illegal' pregnancies, usually of a second or third child, in China is one well-documented phenomenon.¹⁶¹ Men have also been affected; in the last six months of 1976, 6.5 million men were forcibly sterilized in India.¹⁶² There has also been a trend away from user-controlled contraceptives (e.g. condoms, diaphragms, short-acting pills) to long-acting, provider-controlled methods such as injections or skin implants of 'time-capsule' contraceptive drugs. A woman who experiences adverse effects from the contraceptive, or who decides she wants to have a baby, has very little choice but to wait for the effects to wear off, or to find a doctor who is trained and willing to remove the implant (which is intended to be effective for five years). This can be problematical as government approval might be necessary for removal.¹⁶³ Government-led, coercive use of population control methods amount to a bullying of the powerless, bureaucratic control and industrial production of humanity, and the attempted enclosure of human reproduction. The attempt to control population growth through the commercialization of innovative contraceptive technologies is simply one more way of expressing the misplaced notion that economic growth will eliminate poverty. However, since attempts to control effects and not causes are unlikely to have a significant effect on population growth rates unless severely coercive measures are introduced, a course of action certain to be strongly resented by the affected population, the policy is doomed to failure.

Daniel Quinn quite rightly points out that population growth is driven by increases in food production.¹⁶⁴ He suggests that population growth can be checked by keeping

food production at some fixed level. This is undoubtedly true (except for the short period while food stocks last), but contains the danger, not discussed by Quinn, that unless social and economic arrangements are adjusted to ensure that the poorest have sufficient access to food, the structure of famine and malnutrition for billions of people in the 'developing' countries would continue even as the world population stabilized. Halting increases in food production is an effective, but not a morally acceptable method of halting the rise in human population.

Other things can be done. They fall mainly into the realm of social justice measures. There is enough food being produced now to feed the world. It must be true as all the people alive now must be eating, even if it is not regularly or sufficiently. Many people have access to more food than they can ever eat, let alone more than they really need. Food can be redistributed from people who have more than enough to those who do not have enough. We might strengthen the trend away from animal products in our diets in order to free up more grain for people to eat. There are also wastage problems all through the food system which could be rectified to some degree.

Issues of unequal power inherent in economic relationships also need to be addressed. It simply is not acceptable that a country in the midst of a food crisis should be exporting food to rich Northern markets, but that was exactly what was happening during the Ethiopian famine of 1984. At the end of October of that year, as the crisis was deepening in Ethiopia, cases of beans and green peppers were arriving at London's Heathrow airport, and beans, melons, and sweetcorn from Ethiopia were on sale in London shops because "They needed to export food to earn hard currency."¹⁶⁵ The lifestyles of almost all of us in the North are based on 'ghost acreage' in other countries, particularly in the South when it comes to luxury items like out-of-season fruits, vegetables, prawns, coffee, tobacco, and so on.¹⁶⁶ These crops frequently impoverish local people by removing them from the land, where they might be self-sufficient, and then degrading the resource base through monoculture and unsuitable management practices. Tobacco production for export is degrading the soil in Malawi as it accounts for deforestation for the wood required for tobacco curing. Coffee production has "ruined a considerable proportion of Brazil's soils." Peanut plantations are doing much the same in French West Africa. About half the world's mangrove forests have been cut down to accommodate prawn farms, particularly in Thailand and Ecuador. The rapid growth of soya bean production in Brazil has forced the migration of "vast numbers of peasants" from the south into the Amazon where they clear the forest to grow food to live.¹⁶⁷

This lucrative export trade in food removes the poorest people from the land,

resulting in a false 'land scarcity,' which in reality is a massive land concentration in the hands of the rich and powerful. Two percent of Guatemalans own 65 percent of the best agricultural land. The 18 largest Brazilian landowners control an area larger than the combined total area of The Netherlands, Portugal and Switzerland. 80 percent of the agricultural land in the Philippines is owned by five percent of all families. In the United States, four percent of the total number of farmers own nearly half the country's farmland, showing that this phenomenon is not simply one of the South.¹⁶⁸ When we think of 'overpopulation,' we usually think of China, Bangladesh, and India. Japan's self-sufficiency in food is now 42 percent.¹⁶⁹ The Netherlands has the highest population density in the world.¹⁷⁰ Why don't we talk of 'land scarcity' and 'overpopulation' in these countries?

We could perhaps say that there is no current population problem. We have the physical ability to feed everyone alive in the world now. The crisis that looms in the future is that, given current population growth rates, agricultural policies, and socio-economic relationships, we are certain to exceed the total carrying capacity of the Earth during the next half century. This will not happen suddenly, but rather over several decades; a slow, creeping crisis, one face of the 'gradual Hiroshima.' Has it already begun? This is difficult to assess, since rich countries, such as Japan and The Netherlands, where the carrying capacity of the land has probably been exceeded by a wide margin, maintain their populations through ghost acreage in other countries. 40 percent of Kenya's arable land is used to grow coffee, tea, and sisal for export. When the poor demand land for subsistence, then you have 'overpopulation.' Mechanization has also contributed to the creation of 'overpopulation' and 'land scarcity' from what was previously considered to be *underpopulation*.¹⁷¹ A University of California book shows a picture of a tomato harvester at U.C. Davis picking and sorting an average of 35 tons of tomatoes an hour.¹⁷² How many farm laborers underemployed? An extreme example, perhaps, but nevertheless one that shows how mechanization can contribute to poverty.

There may be poverty and famine in the countries which supply agricultural products to the crowded North, despite the fact that these countries may still be capable of sustaining their population from their own agricultural resource bases. If poverty and famine are created by unequal power relationships, then their supposed cause, 'overpopulation,' must be a concept invented by those who do not wish to see equitable economic and social arrangements implemented, and who wished to justify coercive, provider-controlled, contraception campaigns.¹⁷³ What we will find if we really intend to eliminate poverty and famine, and return the Earth to a healthier, safer condition, is that it is the countries of the North that are overpopulated, not India, Bangladesh and China. It is, of course, these rich Northern populations whose

relative impacts on the global environment are far greater than those of the South who set in motion the chain of events which has led to the present ecological crisis, although it is the mindset of nearly all of us alive in the world today that makes the problem so intractable.¹⁷⁴

To conclude, a policy to stabilize (and reduce) world population must consist of the following elements:

1. abandon the attempt to continually increase world food supplies,
2. initiate social and economic policies favoring economic advancement and political empowerment of the poor,
3. provide safe, high-quality, and user-controllable contraception available to all who want it, at prices affordable by the poorest.

It is recognized that this is NOT a policy agenda that is likely to be implemented by governments or endorsed by the UN in the immediate future, even given the fact that it is easily feasible any time that we should have the political will to put it into practice. I fully concur with Tom Athanasiou when he states that it is "cowardice to suggest paths to recovery without implying the political changes necessary to take those paths,"¹⁷⁵ and intend to indicate below the kind of political changes and arrangements I would envision in order to implement this and other necessary steps.

4.-2. What does a 'sustainable' future look like?

It is intended to give here a brief description of some 'laws' which would have to be incorporated into lifestyles as the basis of society attempting to live on the Earth in a sustainable and humane way. I have stated previously that I believe the political form of such a global society would be a large number of bioregions, each consisting of a confederation of small towns or villages.¹⁷⁶ I continue to believe that this is possibly the most viable way forward, except to state that:

1. if the future is based on a new cultural vision, it will not be predictable. If it were, it would not be a new vision. It is therefore rash in the extreme to make hard and fast statements about future political arrangements.¹⁷⁷
2. it is also not possible to gauge the likely value system, or range of values, held by people living after the transition to a 'sustainable society' and thus difficult to know what level, or range of levels, of material existence such people might choose to adopt.

With regard to 2., there are those who "would like to see human beings live much more like the way they did fifteen thousand years ago as opposed to what we see

now." ¹⁷⁸ Some will consider this extreme, but that is no reason for saying that nobody should be allowed to live that way if they want to, or for denying them the full right to the environment they would require to do so. Others have suggested lifestyles which are very much closer to our current way of life and show how the transition to a sustainable society could be effected with relatively little social disruption. ¹⁷⁹

It should also be pointed out that what is being suggested here is not the so-called 'sustainable development,' which is the term being used to push industrial development or economic growth as the only acceptable solution to global environmental problems, the maximization of international trade being seen as the best way to achieve this. ¹⁸⁰ It should be quite clear from the preceding discussion that this is totally rejected as a false and cynical approach to the current problems.

Under the heading 'Sustainable Development,' in the World Commission on Environment and Development's *Our Common Future*, we find the words:

Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their needs. ¹⁸¹

The sentiment of intended intergenerational equity is laudable, but the problem with this is that present needs and future needs are not necessarily equated. 'Needs,' being a highly subjective perceptive trait dependent on time, place, social standing, and other circumstances, are highly variable. Just this exact nature of needs has been cleverly utilized over the last century or so to create and convert the 'wants' of populations in both industrialized and 'developing' countries into 'needs,' thereby creating the consumerist atmosphere that we live in today. ¹⁸² We clearly need a more robust notion of sustainability.

One "simple" definition of a sustainable society is:

A sustainable society is one that can persist over generations, one that is far-seeing enough, flexible and wise enough not to undermine either its physical or its social systems of support. ¹⁸³

This is much more satisfactory, but does not give anything like a clear picture of what we need to do concretely in order to achieve sustainability. For this we must turn to Herman Daly's *Steady-State Economics*. Daly defines the steady-state economy as:

an economy with constant stocks of people and artifacts, maintained at some desired, sufficient levels, by low rates of maintenance "throughput" ...¹⁸⁴

What this definition says is that we may put resources through the system ("throughput") in order to maintain society at some desired level, but must be sure to do so at rates low enough to ensure sustainable management of the system. Thus:

The main principle is to limit the human scale to a level that, if not optimal, is at least within carrying capacity and therefore sustainable.¹⁸⁵

In other words, we are to live within carrying capacity. Generally that will mean that a certain group of people inhabiting a certain area will have to limit their population to a certain number of people in order to live at a certain standard of living. More concretely:

a) Technological progress ... should be efficiency-increasing rather than throughput-increasing.

b) Harvesting rates of renewable resources should not exceed regeneration rates.

c) Waste emissions should not exceed the renewable assimilative capacity of the environment.¹⁸⁶

These principles help define quite concretely the kind of lifestyle that would need to be introduced if we are to live in a sustainable society. One possible problem with these principles, assuming that everyone accepts and agrees to live by them, is will it be possible to measure, with the degree of accuracy necessary to avoid environmental degradation, whether or not activities are actually being kept within sustainable limits? Principle a) would seem to pose the most problematical questions. Is it permissible, for example, to increase throughput if an even greater gain is made in efficiency? One would assume that people who were serious about sustainability would attempt to monitor their activities and technological innovations so that any violations of the principles would be rectified before they became problems.

Daly also allows the use of nonrenewable resources:

d) Nonrenewable resources should be exploited, but at a rate equal to the creation of renewable substitutes.¹⁸⁷

This is also problematical as the decision to use nonrenewable resources will depend on value judgements about the use to which they were put. Assuming, therefore, that a sustainable society would not use nonrenewable resources frivolously, it should also be necessary to stipulate that the conversion to renewable resources for any particular use be made as quickly as reasonably possible in order to leave as much 'capital' as possible for the use of future generations who might have other (nonfrivolous) uses for the resource. The question, however, may be technical as we are now using up the most easily available and, presumably, useful nonrenewable resources at a rate that may make the utilization of nonrenewable resources a very minor consideration.

All this is excellent as long as we can guarantee that nearly everyone in the world will keep strictly to these principles nearly all the time. That may be a very difficult target to achieve, or perhaps it might be possible to achieve this by means of very thorough educational measures, although it is hard to see how this could be carried out satisfactorily all over the world over long periods of time. We still need to consider how all this might be put into practice.

A short, non-exhaustive, sample list of concrete guidelines for a rural or semi-rural sustainable agrarian community might look like the following:

1. Reduce population.
2. Implement local, 'grassroots,' 'face-to-face' democracy.
3. Reduce social overheads without reducing necessary social services to those that require them.
4. Reduce dependence on fossil fuels to the minimum, and eventually to zero. All energy sources should be renewable and energy generated sustainably using local materials.
5. Travel by public transport, bicycle, horse, or on foot.
6. Ensure that everyone is able to live within easy traveling distance of necessary social services.
7. Grow as much of your own food as possible, and eat mostly seasonal food grown locally.
8. Eat less meat and animal products.
9. Use traditional farming practices: organic farming, reduced dependence on machinery – no petrochemicals, much greater use of farm animals.
10. Live in housing based on traditional architecture, using traditional construction materials.
11. Wear clothing made from natural fibers, ideally grown and manufactured locally or personally.

12. Use low throughput communications technology. How the use of radio, TV, telephone, computers, and newspapers will develop in a sustainable society is unpredictable, but the combination of regional radio with local newssheets might result in the lowest resource throughput.

Note that economic growth would not be a consideration in such a society, and that property rights would be culture-specific, differing from area to area, and that there is therefore no attempt to predict or include them here. The above guidelines are also based upon the notion of a Northern rural community practicing agriculture, because perhaps that is where the biggest changes must be made. It should be noted that what is intended here is not 'totalitarian' anthropocentric agriculture, but an agriculture that is sustainable in terms of the ecosystem that it is contained within, that is truly "ecocentric."¹⁸⁸ Nevertheless, the intention here is not to suggest that all people everywhere should practice some form of agriculture. As cultures re-diversify, a huge diversification in lifestyles and sustenance regimes would be expected to take place.

Guideline 3. covers what is in current society a huge area including education, health, defense, police, even 'work,' and retailing. No predictions can be made about how much of what kind of services people will elect to provide for themselves. What is fairly predictable is that as communities become relatively small (less than 5,000 people?) and largely self-sufficient, they will wish to reduce 'regrettable necessities,'¹⁸⁹ such as police forces, and unnecessary social overheads, such as huge government bureaucracies, in order that as many people as possible can be productive. Whether there will be 'work' or schools, or hospitals, or shopping centers, and so on will depend on the local conditions and value systems of individual communities.

These guidelines should make it possible for most people to imagine the kind of life people might lead in a sustainable society. Some people reading this may even have experienced such a life. It is perhaps not a life full of excitement and the kind of entertainment opportunities afforded by modern urban environments, but do we really wish to go out in a short blaze of glory, or live a quiet existence that will ensure the survival of another thousand or ten thousand generations of humanity?¹⁹⁰ Even then some people will not be convinced that the likes of a 'sustainable society' described here will guarantee no backsliding into anthropocentric growthism. Perhaps what we are looking at here is (for some) a transition stage that will help us to buy time while people think about how they really want to live (with the benefit of the hindsight of our current insanity). Perhaps what we are *really* looking for is "a system so perfect that no one needs to be good,"¹⁹¹ a world in which anyone can do

anything that is practicably possible without having to be concerned about the long-term consequences for the ecosphere. But what might that entail, and anyway, how can we get there from here?

4.-3. A New Vision

If we return for a moment to Daly's definition and principles of a steady-state economy, shown above, it might be noted that true nature-based societies, the only kind of human existence before the invention of totalitarian agriculture, do in large part keep to these principles, if not by understanding the principles in a rational sense, through the medium of their culture. Quinn has indicated further 'laws' that can help us understand what it means to live 'sustainably' on the Earth. He mentions several times the Law of Limited Competition:

You may compete to the full extent of your capabilities, but you may not hunt down your competitors or destroy their food or deny them access to food.¹⁹²

This is also known as the peace-keeping law, as it can be restated as "you may compete, but not wage war."¹⁹³ It is reasonable to assume that until the invention of totalitarian agriculture approximately 10,000 years ago, humanity lived according to this law, lived like any other creature in the ecosystem, thus preserving the abundant diversity of ecosystems that is the basis of all life on Earth. Humans hunted other animals for food and other necessities, but not to kill them in order to appropriate more of the product of the ecosystem for human consumption. Humans existed in dynamic balance, a negative feedback system, with the local ecosystem.

Quinn also gives us his rendering of the ultimate Law of Life:

The world is a sacred place and a sacred process, and we are part of it.¹⁹⁴

Despite our cultural story, our creation myth, and our semi-conscious perception of our destiny, we have been slowly forced over the last five centuries to come to the realization that humanity is not placed at the centre of the universe, and is not the ultimate purpose of evolution, nor the *raison d'être* of the planet Earth. We are one small part of a miracle that can live without us, but which we cannot exploit at will without destroying our own basis for life. We evolved on the Earth and are an integral part of it. If we will allow it to happen, life, evolution, and creation can continue for aeons into future with humanity one part of the miracle, a conscious witness, since we are the Earth become conscious.¹⁹⁵

These two 'Laws' are then an adequate mental scheme which we can use for reference as we set out on our journey towards the future of human existence on Earth, but starting from the reality of our present existence, how do we effect change in the direction we wish to go?

Humanity is currently enacting a cultural story of which it is becoming increasingly fashionable to criticize. This recent explosion of abhorrence towards our cultural vision alone tells us just how far and how fast our culture is collapsing. We need to start thinking about replacing it with a new cultural vision. It cannot be propped up and persuaded to limp along for a few more centuries by a policy change here and a new program there. It is time to stop diddling around with the ecosphere and move on to a state where we can make our peace with the Earth, the ecosphere, the particular ecosystem we inhabit, the community of life within it, and amongst ourselves. The new cultural vision will therefore be instigated by people who have seen the futility of the old one, turned their backs on it totally and irrevocably, and are determined to enact a new story for humanity. In short, people who have *changed their minds*. It is not easy or difficult to change your mind, it just happens when the time is right. When you know the pronouncements, reassurances, flattery, exhortations, and euphemisms of the politicians, businessmen, and advertisers for what they are—propaganda, lies, bribes, empty promises, and threats—, and when they tell you that 'there is no other way,' but you know that there *is* no other way if we want our descendants to walk "The Beautiful Trail," then you will be ready.¹⁹⁶ When enough people have changed their minds, we will begin to enact the new cultural story. There is every reason to believe that we will find it more satisfactory than the one we have now. It has to be better to be 'poor' on a healthy planet than 'rich' on a sick one.

You may think (abstract as it is) that this is unrealistic, but it has happened before. It happened 10,000 years ago, but we also know that it has happened more recently than that. The horse-riding Plains Indians of North America had not always ridden horses. The horse had previously become extinct in North America at the end of the last Ice Age, and did not return until the Spaniards brought horses to New Mexico in the 16th Century. Some Indians learned how to ride horses and obtained them through stealing, until by mid-18th Century almost every Plains Indian tribe had horses. These Plains Indian tribes were not culturally related peoples, they were a mixture of about thirty different peoples, both agricultural peoples and gatherer-hunters. Many of them were drawn onto the plains by the possibility of hunting bison using horses, and guns, which entered the plains from the east at the same time. All of these tribes gave up their traditional lifestyles when they saw the vast wealth that would be theirs

for the taking if they hunted bison with the horse and rifle. The difference in their cultures had effectively disappeared by 1800, by which time only the trained eye of an anthropologist could tell them apart. None of these peoples told themselves that they knew the only right way to live. They were able to change their minds and change their lifestyles in response to something they felt was 'better'.¹⁹⁷

Around 2000 years ago, a tribe known as the Hohokam is known to have built dams and irrigation canals in an area near Snakestown, south of Phoenix. As well as attempting to control their environment for agricultural purposes, this tribe also played ball games on courts using rubber balls, built flat-topped pyramids, and used acid to etch designs on marine shells. Around 1100 the Hohokam apparently suddenly decided to abandon this way of life. We do not even know what they called themselves. "Hohokam" is the Pima word for "the disappeared." They did not tell themselves, "This is the one right way to live." They were able to walk away from it when they decided that it no longer worked, and start again somewhere else.¹⁹⁸

Every culture is an experiment.¹⁹⁹ It has to figure out what works for itself in its particular situation, develop its own cultural vision, and act out its own cultural story in a way that will ensure the survival of the group. Our culture, huge as it is—and what a sign of insanity it is that one culture should virtually take over the whole Earth—, is only one culture. It can be changed if we make up our minds to go a different way. It is not the only one possible, and right, way to live. It is only one way to live out of a potential near-infinity of possible cultures. This way of life is not humanity itself, nor is it 'human nature,' it is merely a short-term aberration. There is *nothing wrong with us at all*, we only need to put this present phase behind us as we rediscover better ways of living with the planet Earth.

When should we start, and how long will it take? How long does it take to change your mind? If you really still need convincing, why not try reading some of the books in the bibliography? Take a few years to think about it. Talk to your family and friends. See what kind of future they would like to build. Then let's get together and do it. But soon, please, as the longer we wait the deeper the crisis, and the longer it will take to heal the damage.

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- 150.UNDP, p.203
- 151.UNDP, pp.6-9
- 152.Daly, H.E., pp.258-259
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- 157.<http://www.kerala.com/kera/travel.htm>, Lappé, Frances Moore and Joseph Collins, p.24, Tom Athanasiou, Tom, p.89
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- 165.Hancock, Graham, pp.56-57

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- 167.Goldsmith, Edward, 1996b, pp.83-85
- 168.Hildyard, Nicholas, p.284
- 169.Tokyo Shinbun, 1 February, 1997
- 170.Athanasiou, Tom, p. 81
- 171.The Ecologist, p.143
- 172.University of California, p.62
- 173.Hildyard, Nicholas, p.282
- 174.See Erlich, P.R., Anne H. Erlich and Gretchen Daily, p.26. I (environmental impact) = P (population size) x A (affluence per person) x T (technology). In terms of per-capita energy use, "the impact of an average U.S. citizen in 1991 was about 20 times that of a Costa Rican, 50 times that of a Malagasi, and 70 times that of a Bangladeshi." In terms of the agricultural resource base, Kerala is probably not 'overpopulated', since its ghost acreage elsewhere is matched by productive agricultural land within its own borders.
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