

# **PEOPLE AND PLANET**

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## **PREFACE**

This is a contribution by a non-scientist to a debate of importance to all humanity. We share a common responsibility for the fate of Planet Earth which is our home. And we share also in the outcome of decisions that are made about it; we are all in the same boat.

Most likely, there are errors in this paper – of fact and of interpretation; it is certainly incomplete. I can only suggest to readers that they take from it whatever they find helpful and ignore the rest. Alternatively, come up with something better.

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## TIMELINE

*Most early dates are approximate and debatable.*

*The following dates are Before the Common Era. (BCE=BC)*

13,700,000,000: the universe begins in the Big Bang.

5,000,000,000: the Milky Way comes into being.

4,500,000,000: the Earth is born.

4,450,000,000: atmosphere, oceans and continents form on earth.

2,300,000,000: the first Ice Age begins on earth.

700,000,000: the first multi-cellular living creatures.

510,000,000: the first vertebrate animals.

440,000,000: the Ordovician catastrophe.

395,000,000: the first insects.

375,000,000: the second great catastrophe (Devonian).

370,000,000: trees begin and vertebrates go onto land.

315,000,000: reptiles.

250,000,000: warm-blooded reptiles.

245,000,000: the Permian extinctions, with 85% of species dying.

235,000,000: dinosaurs and flowers.

215,000,000: the first mammals.

210,000,000: Pangaea, the first continent, breaks up; the Atlantic Ocean appears.

150,000,000: birds.

70,000,000: the first primates.

67,000,000: the Cretaceous extinctions.

55,000,000: horses, whales, rats and bats.

37,000,000: the Eocene cosmic impact catastrophe.

35,000,000: monkeys, cats and dogs.

30,000,000: apes.

25,000,000: grass spreads across the earth.

15,000,000: the Miocene cosmic impact catastrophe.

5,000,000: the lines between apes and human begin to diverge.

4,000,000: some human ancestors begin to walk upright.

3,600,000: a new round of Ice Ages begins.

3,000,000: "Lucy" lives in Tanzania.

2,500,000: hominids begin to use stone tools and to eat meat.

2,000,000: the earliest known genuine human ancestors.

The above lived in Africa, and, as far as is presently known, nowhere else.

1,700,000: hominids migrate from Africa and begin to use fire.

800,000: common ancestors of Neanderthals and humans in Spain.

730,000: the Pleistocene cosmic impact catastrophe.

500,000: clothing, construction of shelters and the use of axes.  
200,000 to 30,000: Neanderthal man co-exists with *homo sapiens*.  
100,000: ritual burials begin.  
70,000: ritual play, dance and language develop.  
40,000: people move into Australia.  
35,000: people move into the Americas.  
30,000: music begins.  
20,000: weapons are developed for hunting and for war.  
18,000: cave painting.  
12,000: end of the last Ice Age; animals begin to be domesticated.  
9,000: world human population is about 1 million.  
8,000: a transition begins from hunting and gathering to agriculture and pastoring; irrigation begins to be used; the first towns are formed.  
7,000: smelting of copper and gold.  
5,000: formal religion develops, beginning with Hinduism.  
4,500: copper smelting begins.  
4,000: cities develop, beginning in the Middle East.  
3,500: world population is between 5 and 10 million; writing begins.  
3,300: bronze smelting begins.  
2,500: iron smelting begins.  
508: Siddhartha Gautama (the Buddha) is born.  
4: Jesus is born.

The following dates are of the Common Era (CE = AD)

1: Rome becomes the world's first one million-person city.  
100: world population is about 300 million.  
542: bubonic plague sweeps Europe, killing perhaps 25 million people.  
570: Muhammad is born.  
1347: the Black Death, probably bubonic plague, kills one-third of Europe.  
1500: world population is about 450 million.  
1605: Francis Bacon's *Advancement of Learning* bases scientific method on empirical observation.  
1760: the steam engine is developed by James Watt.  
1770: the Industrial Revolution begins.  
1783: a volcanic eruption in Iceland releases so much ash that it causes world-wide hunger.  
1792: the developer of the first computers, Charles Babbage, is born.  
1800: about 3% of humanity lives in cities. World population is 1 billion.  
1821: Michael Faraday invents the electric motor.  
1844: the telegraph is invented.  
1895: radio is developed by Guglielmo Marconi.  
1900: about 10% of humanity lives in cities.

1934: Ernest Rutherford produced the first nuclear fusion reaction.

1945: atomic bombs used in warfare.

1958: the microchip is developed.

1960: the contraceptive pill comes into use.

2000: more than 50% of humanity lives in cities; on a world-wide basis, life expectancy reaches the early sixties.



## **CLEAN AIR**

Air recognizes no international borders; it carries no passport. A US scientist estimates that ‘more than 1 per cent of some air pollutants in the United States come from *Chinese* power plants.’ (James Hansen, *Storms of my Grandchildren: The Truth about the coming Climate Catastrophe and our last Chance to save Humanity*, Bloomsbury, London, 2009, p.196) Perhaps it is surprising that the figure is not larger, and, of course, at times the flow of pollution is probably in the opposite direction.

Oxygen matters. The level of oxygen in the air is a constant 21%. It remains close to that level whether in the rainforests of Brazil, over the vast expanse of the Pacific, or the industrial conurbations of Europe and Asia. If there were a higher level of oxygen, things, even wet grass, could catch fire spontaneously. If it were at a lower level, we would suffocate. (James Lovelock, *Gaia: A New Look at Life on Earth*, Oxford University Press, New York, 1979)

While it is possible to write or talk about air, land and sea as if they were separate, in reality they are linked and the fate of one affects the others. There can be no healthy air without healthy oceans or healthy land. But the oxygen supply and the quality of the air we breathe is under threat.

### **The air**

In the week following the 911 attacks on the United States in 2001, President George W. Bush, to forestall possible further attacks, ordered the grounding for a week of all civilian flights over the contiguous US. In that short space of time a change in the sky was noticeable. In some places the amount of light reaching the ground was said to have increased by 25%. That figure may have been a journalistic guesstimate, but, even if imprecise, it is an indicator nonetheless of the difference made in a short time by the absence of contrails and aviation engine exhausts.

In the UK, London was for long notorious for its “pea-soup” fogs. They form part of the background to the nineteenth-century novels of Charles Dickens and Sir Arthur Conan Doyle. But, in the winter of 1952, in the West End, the city’s theatre district, shows had to be cancelled because concert-goers could not see the stage for the fog. The government’s response was to advise people to use the gas-masks they had been issued at the start of World War II in 1939. A junior minister and later Home Secretary, Reginald Maudling, told the Prime Minister, Winston Churchill, that the government’s scientific advisers believed the masks were not only entirely ineffective against fog but might actually make matters worse for some users. Churchill’s reply was that while Maudling and he knew

that, the people did not, and as long as they, the people, thought the masks were a help, no good end would be served by telling them otherwise.

More serious was the loss of life, especially of those who suffered from respiratory illnesses; an estimated 4,000 people died as a result of the Great Smog of December 1952, with another 8,000 in the weeks that followed. In 1956, however, despite initial government resistance, the British Parliament passed the Clean Air Act which, among other things, required the replacement of traditional coal fires by fuels such as “clean coal”, electricity and gas. Power stations were relocated away from cities. These actions made a large difference for the better. Britain’s air became cleaner, no longer smelling of soot, and people’s lungs became healthier. There was also an unanticipated benefit: public buildings, long coated in grime, stayed clean after it was removed. The 1956 act was followed by others which brought further improvements. But increased road traffic, especially of diesel vehicles, has polluted Britain’s air to such an extent that, by 2016, it is claimed that 40,000 people a year die there because of dirty air.

China builds new coal-fired electricity generating stations at a rate of one every five days. They are mostly fired by brown coal, an even worse polluter than black, especially in sulphur dioxide.

The Montreal Convention of 1987 banned the use of chlorofluorocarbons (CFC’s). Widely used as refrigerants, CFC’s were believed to be responsible for a hole in the ozone layer over the Antarctic, which peaked in 2006 at an extent about one and a half times the area of Antarctica. That layer protects earth from rays emitted by the sun which cause cancers in humans. The Convention was ratified by 197 states which then implemented it with equitable burden sharing. The UN Secretary-General, Kofi Annan, described the Convention as ‘perhaps the single most successful international agreement to date.’ The hole in the ozone layer has been declining since 2006, and at a faster rate than anticipated. The intense level of public awareness and concern about the problem seem to have weighed heavily in favour of action. Just fourteen years elapsed between scientists discovering in 1973 that there was a problem and the adoption of the Convention. It was an example of how things can be done when there is a will to do them; scientifically-based evidence, public awareness and demand for action make a powerful combination. The fear of cancer, too, was a likely motivator. Happily, in 2016, at a conference in Kigali, Rwanda, agreement was reached to abandon the use of hydrofluorocarbons in refrigeration. They are potent greenhouse gases which also damage the ozone layer, but the agreement was weakened by a slow process of implementation, with two major users, China and India, not having to begin reduction of their output until 2029 and 2032 respectively.

Ireland, despite being situated on the edge of the Atlantic Ocean, with the prevailing wind from the south-west, has significant problems of air pollution, especially from diesel-powered vehicles. In 2016, the Environmental Protection Agency reported that there were 1,200 premature deaths a year from such pollution. The country is set to breach its binding commitments in 2016 or 2017 after a 3.7% surge in emissions across all the main sectors. Ireland spews close to 60 million tonnes of greenhouse gases into the atmosphere every year, that is, 113 tonnes every minute, and the volume is growing. There is a need to break the link between economic growth and increasing greenhouse gas emissions, but that may be attempting to square a circle.

### **The sea**

Plankton absorb energy from the sun, and nutrients from sea-water, to produce their food. In the process of photosynthesis, they release molecular oxygen into the water. It is estimated that between 50 and 85 per cent of the world's oxygen is produced via phytoplankton photosynthesis. The rest is produced by photosynthesis on land by plants. Phytoplankton photosynthesis has controlled the atmospheric CO<sub>2</sub>/oxygen balance for millions of years.

The oceans supply one billion people with almost all their protein, but overfishing, climate change and pollution are killing off this source of supply. As one example, an area of the North Pacific, roughly estimated at 100,000 sq.km., is dead because of being covered by plastic rubbish flushed into the ocean from rivers, and dumped overboard from ships. Currents and winds carry it to this area and it remains there, blocking off light from the sea. It is only one of many areas of the oceans which are dead. Some efforts are being made to protect what is left. But what belongs to nobody is often cared for by nobody. No one wants to accept responsibility for the mess, much less pay to clean it up. Rising sea temperatures have already destroyed about 25% of coral reefs, so fish can't breed or grow there. Any source of regeneration is lost. Nature, as ever, is generously resilient: if even one-third of the oceans remain healthy, that may be enough to re-generate the rest, if given a chance and if we stop using them as a dump.

A plastic bottle takes between two to five hundred years to break down in sea-water. But what does "break down" mean? It does not mean to cease to exist. It may mean to disappear, because the particles will eventually become so small as to be invisible, especially in water. But that means that fish will ingest them, doing no one knows what harm to the food chain. You can't wish away ugly reality.

The British environmentalist, David Attenborough, says that, since the Seventies, rising sea-temperatures, and acidity as a result of oceans absorbing carbon dioxide from the air, have brought about the destruction of about forty per cent of Australia's Great Barrier Reef. These factors have a negative effect on plankton's ability to do their job – vitally important to us – of producing oxygen. Oceans absorb about one-third of our output of CO<sub>2</sub>. But they are being over-loaded and becoming more acidic, resulting in the deaths of coral reefs.

Thor Heyerdahl, famed for travelling in craft that replicated those of the earliest ocean voyagers, wrote, 'The ocean was clear when we sailed the Kon-Tiki raft in 1947.... In 1969, we were to attempt a crossing of the Atlantic.... The very first morning we woke up off the coast of North Africa, and found ourselves sailing in a soup of glittering oil and asphalt lumps....' 'As we sailed away from Africa, almost every day we passed solid clots of asphalt, ranging in size from rice to potatoes.... In 1970, we sailed our second papyrus ship, Ra II,.... from Morocco to Barbados.... We picked up oil clots on forty-three out of the fifty-seven days the voyage lasted.' (*Green was the Earth on the Seventh Day*, Little, Brown & Co., London, 1997, pp.286-7) Oil and asphalt are bad news for plankton.

Pope Francis asked a pertinent question, 'Who turned the wonderworld of the seas into underwater cemeteries bereft of colour and life?' (His encyclical letter *Laudato Si'*, *On Care for our Common Home*, 24 May 2015, n.41)

## **Land and Forests**

Our supply of oxygen is being reduced through deforestation, especially in the Amazon River basin, Siberia and Africa.

### *Amazon River basin*

Take trees and other vegetation, for example. They produce the oxygen we inhale and remove the carbon dioxide we exhale. We need them; they don't need us. In the Amazon River basin, already substantially reduced through logging, human settlement and slash-and-burn agriculture, a new threat has emerged: the Brazilian Congress has enacted legislation allowing for half of what remains to be felled. Once it's gone, it's gone.

### *Siberia*

A significant part of the world's oxygen supply comes from the forests of Siberia. President Putin of Russia signed a contract granting a South Korean conglomerate *carte blanche* to exploit a large tract of the *taiga* with no environmental restrictions. For good measure, he also abolished Russia's

Environmental Protection Agency, a toothless body in any event. (*The St. Petersburg Times*, 11 July 2000, pp.1-2)

### *Indonesia*

Eighty per cent of the country's primeval forest, minimally touched by human hand through millennia, and a rich source of biodiversity, has been cut down mostly to be replaced by palm oil plantations. Forests where elephants, tigers and orangutans lived together until recent times are now gone forever. They were cleared by being burned, releasing huge volumes of greenhouse gases into the air.

### *Africa*

The fuel crisis in the First World is mostly about oil. The "Fourth World" is that part of the Third World which doesn't have oil; there the fuel crisis is about firewood and charcoal. Africa lost 10% of its forest between 1980 and 1995, losing an area equal in size to Belgium every year. (See Ellen Teague, "Mozambique is a warning", *The Tablet*, 11 March 2000, p.340)

For about twenty years I flew regularly by night between London and Lusaka in Zambia. At any time, one could see large fires burning all the way from the southern edge of the Sahara to Lusaka. This was not someone cooking their supper – that would not be visible from 30,000 feet; it was clearing of forest for slash-and-burn agriculture. In Zambia itself, I recall seeing a teak tree burning so that its ash would fertilize a crop of cassava.

In Madagascar, an early morning riser will see daily convoys of trucks carrying bags of charcoal to the market in Antananarivo. Anyone taking a walk in the countryside within a radius of thirty km. of the capital will hear almost constantly the sound of axes thudding against tree trunks. Travelling over the country by air in 1978, and again in 1995, the increased extent of deforestation was clearly visible, as also was the flow of topsoil into the sea at river estuaries. The loss of that soil is irrecoverable.

Waiting for a plane at Cairo airport in 2008, I noticed that the air was *visible* – a faint brown. Airport buildings not far away were in a haze. I thought it might be sand or dust blown in from the desert. I asked a local person and was told, 'It's like that all the time. Cairo is among the most air-polluted cities in the world, and the government, as usual, does nothing.' On a previous visit I found that after two or three days, my throat became sore and my nose began to bleed.

### *Zambia: one specific African example*

About 70% of the country's area is savannah, open grassland with scattered bush and trees. Of this, about 10,000 square kilometres are cleared annually for

agriculture, (Mark Cawardine, *The Nature of Zambia*, International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland, 1987, p.43), and, at a conservative estimate, another 150 sq. km. for making charcoal. The annual net rate of attrition of the country's forest has been estimated at about 2%. All the indications are that this rate will increase with population growth. One estimate was that 90% of rural homes use wood for fuel, while, in the urban areas, 87% use charcoal. (Cawardine, *op. cit.*, pp. 41, 42) Only between 6 and 10% of houses in urban areas have electricity. (H. J. Simons, "Zambia's Urban Situation", cited by Ben Turok, *Development in Zambia*, Zed Press, London, 1979, p.19) In rural areas, it was mostly deadwood, such as fallen branches, that was used, but wood was used also for building. In urban areas, especially around Lusaka and the Copperbelt, the problem reached a critical level in the eighties, with a radius of about 200 km. around those centres already denuded of trees. (Cawardine, *op. cit.*, p.58)

A further problem is created by slash-and-burn agriculture, whether the modest *chitemene* method which allowed most trees to live, or the more severe one of burning everything but the stumps. Furthermore, the practice of burning off grass late in the dry season adds to the problem. Early burning of grass can be beneficial: it kills germs, fertilizes the soil with ash, removes heavy matted clumps of grass, stimulates fresh growth and ensures that forest rather than scrub develops. However, in Zambia, late burning is widely practised, with serious consequences. About 75% of trees under three years are destroyed by it, making natural regeneration of forest difficult. (Cawardine, *op. cit.*, p.44) Healthy, mature trees are easily set on fire in the later part of the dry season, as everything is tinder dry and the temperature of the fires greater. Ground nesting birds are destroyed and the habitat of wildlife eroded. Both before and after independence, efforts were made for several decades to persuade farmers to burn early instead of late, but without success, whether efforts relied on fines or on persuasion.

There is little reforestation, although the scope for it is vast and has potential as a source of productive employment. A very few small-scale forests were planted by the State but they were tiny in relation to the need. Sometimes Zambians seemed to regard trees as natural enemies; perhaps it was some recall of the distant past, when the forest rapidly reclaimed abandoned gardens and villages, that made it seem as a threat, an enemy to be fought against. Whatever the explanation, Zambians showed great enthusiasm for chopping down trees and - most uncharacteristically - could be roused to anger at the sight of someone planting them. Such efforts are commonly vandalized. An incident in the life of the Lozi chief, Liwanika, illustrates something of this attitude. He showed the missionary, François Coillard, the beauty of the Barotse Plain in the west of the country, saying, 'How beautiful! Not a tree! Not one!' (François

Coillard, *On the Threshold of Central Africa; a record of twenty years' pioneering among the Barotse of the Upper Zambezi*, translated by C. W. Mackintosh, Hodder and Stoughton, London, 1902, p.547) Among some tribes, even fruit trees would not be planted because of a belief that the planter would not live to eat the fruit.

The short-term effects of this were already evident in the Nineteen Eighties. Soil erosion was a serious problem in some areas. In others, dams built for watering cattle became useless through sedimentation. The price of charcoal constantly increased above the level of inflation, in part because of the cost of transporting it ever longer distances from the sources of supply. One consequence of that is that people cook food less than it needs, with a consequent decline in standards of nutrition, and water which should have been boiled, for example, in mixing milk powder for babies, was not. The increased time spent making charcoal meant less time for agriculture and also less money for other necessities. As the forest receded so did wildlife, and with that the tourist industry's future became more doubtful.

In the longer term, large-scale deforestation brings with it the possibility of climatic change, such as reduced rainfall and lengthier periods of drought. This was a particular problem in areas such as the Western Province of Zambia, which was originally part of the Kalahari Desert. There, the process of desertification began in the Seventies and has continued since. In the area between the Zambezi River and the Angolan border, savannah grassland and forest was reduced to a charred wasteland, devoid of wildlife. The province is the country's largest, but with the smallest population, so there was a possibility of arresting the problem, provided there was a change of public attitudes. If there was no change, then the province, regarded as the least developed in the country, need not concern planners as it could disappear in a hundred years. Its thin and fragile topsoil overlying an average 80-100 metres' of sand is unlikely to withstand indefinitely the assault being made upon it.

Further afield, I recall a game ranger in the Kafue Wildlife Park saying that it should be re-named the Kafue Grass Park because that was all that remained in it after those he termed "official poachers" - he meant the agents of the Minister of Tourism and Wildlife - had done their work.

Efforts were made in school to educate children to a change of attitude, but little came of them. Partly, this might have been that it was not regarded as today's problem, and the benefits of planting trees would not be seen for a long time.

With similar deforestation in many other countries, the sources of humanity's oxygen supply are being eroded incrementally.

### *Europe*

There is some good news: between 2006 and 2016, the area under forest in Europe *grew* by 44,000 sq. km.

### *Greenhouse gases*

The volume of greenhouse gases we have pumped into the air has already passed safe levels, and, according to some scientists, has also passed the tipping point at which over-heating becomes irreversible as problems feed on themselves. A particular problem with them is that they accumulate in the atmosphere. James Lovelock writes that, 'The biggest indirect effects of climate change are 'starvation, competition for space and resources, and tribal war.' And, 'The climate war could kill nearly all of us and leave the survivors living a Stone Age existence.' (*The Vanishing Face of Gaia: A Final Warning*, Allen Lane, Penguin, London, 2009, pp.20, 22)

Humanity has failed to tackle preventable crises in relation to clean air and drinking water, the destruction of topsoil, global warming and population growth. While worthwhile efforts have been made by individuals, organizations and states, these have been like trying to plug a leaking dam with a finger. The necessary human commitment has not been there. Our ecological sins are catching up with us; there is abundant evidence that the world is moving towards an ecological crisis. 'If there is to be a cataclysmic end to Western civilization.... ecological suicide is by far the most likely cause.' (Richard Koch and Chris Smith, *Suicide of the West*, Continuum, London, 2007, p.184) But it won't be the West alone; we're all in the one boat.

These unresolved crises are unlikely to result in the destruction of the earth. However, they are likely to change it substantially for the worse, making it a place unfit for human habitation on anything other than a small scale.

If human life were to end on planet Earth this minute, our most lasting legacy would be nuclear waste, a final spit in the face of a generous Mother Nature. Earth and its non-human inhabitants would - analogously - breathe a sigh of relief and say, 'Good riddance! They were bad news!' We have taken too much from nature, given little in return, and acted narcissistically as if we were all that mattered.

We humans are the Johnny Come Lately on planet Earth: -



Perhaps an even more effective way of grasping our extreme recentness as a part of this 4.5-billion-year-old picture is to stretch out your arms to their fullest extent and imagine that width as the entire history of the Earth. On this scale, according to John McPhee in *Basin and Range*, the distance from the fingertips of one hand to the wrist of the other is Precambrian. All of complex life is in one hand, “and in a single stroke with a medium-sized nail file you could eradicate human history.” (Cited by Bill Bryson, *A Short History of Nearly Everything*, Black Swan, Doubleday, London, 2004, pp.409-410) ‘Modern humans have been around for no more than about 0.0001 per cent of Earth’s history.’ (Bryson, p.573)

Yet we think and behave with the maturity level of a grasping infant who thinks he should have whatever he wants.

Our negative impact has been huge. By acting as if we were masters of a world created simply for us we have devastated planet Earth, our common home. Lester Brown of the Worldwatch Institute put it this way: -

From 1950 to 1997, the use of lumber tripled, that of paper increased six-fold, the fish catch increased nearly fivefold, grain consumption nearly tripled, fossil fuel burning nearly quadrupled, and air and water pollutants multiplied several-fold. Forests are shrinking, water tables falling, soils eroding, wetlands disappearing, fisheries collapsing, rangelands deteriorating, rivers running dry, temperatures rising, coral reefs dying, and plant and animal species disappearing.

In all this we blindly, stupidly, arrogantly, assume that the possibility of extinction does not apply to us as it has done, and continues to do, to many other living species.

But meanwhile, economists everywhere are calling for business as usual. The American environmentalist Edward Abbey (d.1989) has a word of caution: -

Growth for the sake of growth is the ideology of the cancer cell. The ideology of growth knows no geographic boundaries. It has permeated every corner of the planet. Political leaders in developing countries often denounce the high levels of consumption in industrial countries, but none has talked about eventual limits on their own consumption as they modernize. No national leader of any country, no matter how affluent, has announced plans to stabilize demands on the Earth’s ecosystem once people’s basic needs for food, shelter and health care are satisfied.

### *Bringing it together*

One way of looking at the above is to ask the question: if I were a parent and the preceding pages were my child’s school report card, would I be happy with it? A large question is: where is our oxygen going to come from if we keep doing what we are doing? Furthermore, forests absorb carbon dioxide from the atmosphere. But, with less forest, that inevitably means more carbon dioxide unabsorbed and therefore remaining in the atmosphere, and that means more

global warming. Albert Einstein once said that to keep doing what you have been doing, but expecting a different result, is a definition of insanity.

## **DRINKING WATER**

‘The natural wealth of the earth's forests, fresh water and marine ecosystems has declined by one third since 1970. We are told that if every person alive today consumed natural resources and emitted carbon dioxide at the same rate as the average American, German, or Frenchman, we would need at least another two planet Earths to survive.’ (The *Living Planet Report 2000* of the World Wide Fund for Nature, Brussels, 20 October 2000.)

For a historical perspective on this problem, consider what was said by Sir Crispin Tickell, former British ambassador to the United Nations, ‘World demand for water doubles every twenty-one years, but the volume available is the same as it was in Roman times. Something has got to give. Water will be the progenitor of more wars than oil.’ In similar vein, the late King Hussein of Jordan said that only a dispute over water could break the newly-established peace between his country and Israel. During the twentieth century, human water usage increased nine-fold.

Water is precious. Agriculture needs more of it to meet the needs of the world's more than seven thousand million people, with an extra 220,000 a day. But increased water use threatens ecological systems on which the world depends.

Water covers 75% of the earth's surface, but 97.5% of it is salt water. Desalination, despite recent improvements, produces low-grade water and uses much fuel, adding to global warming. Of the remaining 2.5%, 74% is in ice-caps and glaciers. Nearly all the rest is underground in deep aquifers. Only 0.3% of the world's fresh water is in rivers and lakes. Less than 1% of the world's surface or below-ground water is accessible for human use. Agriculture accounts for 80% of water use, but 60% of it is wasted. In the United States, water from aquifers irrigates large circles of agricultural production in the Mid-West, but, there as elsewhere, the level of aquifers continues to fall.

The WHO estimates that 80% of sickness and disease in the Third World is caused by lack of access to clean water and sanitation. Each year 2.2 million people die of water-borne illnesses. Every eight seconds a child dies of a water-related disease such as dysentery, bilharzia or cholera. (See *The Tablet*, 16 March 2002, p.5)

One third of the world's population lives in “water-stressed” areas, that is, areas where consumption exceeds supply. Over 90% of people in Western Asia live in areas where water consumption exceeds renewable fresh water resources by 10%. The world's richest 20% consume 80% of the water, while 1 billion people do not have ready access to clean drinking water. The poorest buy water

from street vendors at between 10 to 20 times the cost through the mains. In the UK, water costs 0.013% of wages; in Tanzania, it costs 5.7%. (The UN Environmental Programme, 2003)

Pakistan faces a water crisis: 'if some of the more pessimistic scenarios for global warning come true, this could become a disaster which will destroy the country. Already, the mighty Indus no longer reaches the sea for most of the year, but peters out in salt marshes some 20 miles from the coast, as a result of grossly wasteful and incompetent over-exploiting along its course.' (Anatol Lieven, "Alarm call for Pakistan", *The Tablet*, 8 December 2001, p.1738)

In China, the Yangtze River near Chongqing is brown with topsoil from the highlands of Tibet where officially licensed loggers fell the forest; that topsoil, a precious commodity especially in an environment as fragile as that of Tibet, is carried into it by the rains. And the greater city of Chongqing, with a population of 35 million people, did not, as recently as 2002, have even one sewage treatment plant. It is estimated that forty million tons of sewage and industrial waste are poured into the Yangtze *daily*. The same river is the source of drinking water for cities downstream. Also in China, 1524 factories along the Huaihe River had to be shut and one million people supplied with water by army tankers when the river was found to be badly polluted. And again, 'According to the Chinese Institute of Desert Research, land degradation... affects the lives of 400 million people. Current estimates say that 950 square miles of land become desert each year.' (Quoted by Donovan Webster, "China's Unknown Gobi: Alashan", *National Geographic*, January 2002, p.65)

In Spain, warmer temperatures have resulted in less winter snow, and consequently reduced snow-melt in spring. Rivers dry up earlier than before, and so the country now has to import drinking water, experimenting with large rubber or plastic pillow-shaped floating tanks.

The OECD's Environmental Performance Review of Ireland published in November 2000, rated the country's performance as 'unsatisfactory.' The Irish Environmental Protection Agency stated that the number of rivers in pristine condition in Ireland had dropped from 600 in 1987-90 to 21 in 2015, while moderately or slightly polluted rivers rose to 50% of the total length. Half the pollution comes from agriculture, and one-third from municipal plants which pump sewage directly into rivers, lakes or the sea, either untreated or only after primary treatment. Over 400,000 people 'may receive water whose quality is sub-standard.' Contamination by e-coli in the form of faecal coliforms is described as 'widespread', affecting 34% of groundwater. It is not uncommon for people to be warned by local authorities that they should either buy bottled water (which costs more than petrol) or boil their tap-water. It is estimated, too, that, nationally, one-third of the supply is lost through leaking pipes neither

repaired nor replaced through years of under-investment by public authorities. Prodded by the threat of fines to be imposed by the EU, the government decided to set up a single state water agency, instead of some thirty under-funded local authorities systems, and to charge people in accordance with their usage. But that decision encountered such public opposition, led by populist politicians, that it was dropped. So the contamination and waste continue. The Irish experience illustrates the limitations of the democratic process in facing environmental challenges.

In Russia, what was the world's second largest body of fresh water, the Aral Sea, has been destroyed. It is now only a fraction of its former size, rendered so by drainage. The remaining water is intensely contaminated and useless for any purpose. A somewhat similar situation pertains in relation to Lake Volta in Africa.

Call it anecdotal evidence if you will, but anyone who has travelled and observed will acknowledge that, in many countries around the world, rivers are routinely used as handy dumps for industrial, agricultural and domestic waste of every description, including human and animal carcasses - and also as sources of drinking water. An Irish agricultural scientist, John Feehan, stated, 'If people knew what we are doing to the world, they would be horrified.' Humanity and environment are partners, with the environment having the primary role – we need it more than it needs us.

## WAR AND PEACE

### *Injustice as a root cause of war*

James Wolfensohn, then president of the World Bank, speaking in Dubai in September 2003, at a joint meeting of his bank and the International Monetary Fund, said: - 'In our world of 6 billion people, one billion owns 80% of global GDP, while another billion struggle to survive on less than a dollar a day. This is a world out of balance.' He contrasted the amount rich countries spend on aid – just 0.22% of their GDP as against 0.5% forty years earlier – with five times that amount on farm subsidies and eleven times on the military. He was critical also of poor countries for spending more on the military than on education, and went on, 'The rich and the poor are linked in so many ways: not only by trade and finance, but by migration, environment, disease, drugs, crime, conflict and terrorism. We are linked, rich and poor alike, by a shared desire to leave a better world to our children, and by the realization that if we fail in our part of the planet, the rest becomes vulnerable. That is the true meaning of globalization.' He continued, 'Too few control too much, and too many have too little to hope for. Too much turmoil, too many wars, too much suffering. The demographics of the future speak of a growing imbalance of people, resources, and the environment.' (Cited by Kevin Rafferty, "The world is out of balance," in *The Tablet*, 4 October 2003, pp.4-5)

The richest sixty-two people own as much as the poorest half of the world. The richest 1% of the world own as much as the other 99%. Since 2010, the wealth of the poorest half of the world fell by \$1 trillion. (Oxfam, "An Economy for the 1%," prepared for the World Economic Forum at Davos, Switzerland in January 2016, reported in *The Irish Independent*, 18 January 2016, p.25)

'The average income in the world's five richest countries is seventy-four times the level in the poorest five'.... 'Of the largest one hundred economies in the world, fifty-one are corporations.' 'The three wealthiest men in the world, Microsoft's Bill Gates, financier Warren Buffet and Paul Allen, also of Microsoft, have assets of \$156 billion between them. This is greater than the combined gross domestic product of the forty-three least developed countries.' (From Ellen Teague, "Mozambique is a warning," *The Tablet*, 11 March 2000, pp.339-340)

One child in every ten born in the developing world will die before the age of five. (Trócaire relief and development agency) And the French foreign ministry estimated that for every dollar Africa receives in aid it spends about two dollars on the military.

The Worldwatch Institute in Washington DC, stated in 2004, ‘The world is consuming goods and services at an unsustainable pace, with serious consequences for the well-being of people and planet.’ And Clare Short, a former British minister for international development, wrote, ‘Consumption among the world’s wealthy elites, and increasingly among the middle classes, has gone beyond satiating need. Now it is an end in itself.’ (“Consume and Survive”, *The Tablet*, 17 January 2004, p.9) Shopping is not just about meeting needs; it’s about status, therapy and pastime.

‘In the twentieth century, human beings used ten times more energy than the entire human race before 1900.’ (From J. R. McNeill, *Something New under the Sun: an environmental history of the twentieth century*, Allen Lane, Penguin, London, 2000)

The proportion of people living in extreme poverty fell from 29% in 1990 to 23% in 1999, but, in the same period, those in extreme poverty in sub-Saharan Africa rose in number from 242 to 300 million. (From “An Unequal World,” *The Irish Times*, 24 July 2002, p.7) This contributes greatly to the migration crisis experienced in recent years.

#### *Inequality and injustice in the First World*

In Ireland, ‘the most affluent 20 pc... own three-quarters of the country’s wealth, and the poorest 20 pc own just 0.2 pc. As for the top 5 pc, their combined wealth is nearly double that of the entire “squeezed middle.”’ ‘Just 20 pc of earners [are] paying three quarters of all tax,’ and, ‘Some 36 pc of earners pay no income tax at all.’ (David McWilliams and Charlie Weston in *The Irish Independent Review*, 3 September 2016, p.5)

In Britain, 99.9% of the population owns just 7.5% of the land, while 0.1% owns 92.5%. (From Antonia Swanson, *Root of all Evil? How to make spiritual values count*, Saint Andrew Press, Edinburgh, 2003, reviewed in *The Tablet* by Simon Nixon on 13 September 2003, p.17)

Subsidiarity, sustainability and solidarity are three key elements of a peaceful world order, but where the developed world uses, *per capita*, twenty-five times as much of the world's resources as the underdeveloped world, they are not noticeably present. Bringing people out of poverty is a matter of will, not of capacity.

#### *War by terror*

Half of all civilian war casualties are children.

‘Up to the mid-1990’s, when arms reduction measures really began to kick in, as a result of the end of the Cold War, the four nuclear powers had built more

than 137,000 nuclear warheads for use in an “end-game” conflict.’ ‘By January 2000, total numbers among these four nations had declined to 35,810... still more than enough to destroy human civilization many times over.’ These were to be launched from missiles, planes, submarines, artillery and in land- and sea-mines. Winston Churchill commented with characteristic colour, ‘After the first few hundred atomic bombs, the rest will just make the rubble bounce.’

Part of the reason for developing them is national pride: if our enemies have nuclear weapons we must have them, too. So, India and Pakistan, despite their great poverty, spend hugely on them. The former Pakistani Prime Minister, Zulfikar Ali Bhutto, said in the Seventies that Pakistanis would live on grass if that was what it took to get them. In 2002, when nuclear war threatened between India and Pakistan, an Indian army general said his country could afford to lose twenty-five million people.

The nuclear club comprises the USA, Russia, China, Britain, France, Israel, India, Pakistan, and North Korea. Countries which have the capacity to develop nuclear weapons and delivery systems include Switzerland, Sweden, Argentina, Brazil and, soon perhaps, Iran. South Africa is believed to have had the atom bomb but to have destroyed it.

#### *“Dirty” bombs*

‘There is no need to master the complex physics of nuclear chain reaction. Merely wrap radioactive waste material around a conventional high explosive. Large quantities of both are not necessary. Hide the device within a high-profile target to achieve maximum effect.’ ‘Dirty bomb incidents should therefore be expected.’ In 2000, the International Atomic Energy Agency reported 63 known cases of trafficking of radioactive sources such as plutonium. ‘There seems little doubt that the business is increasing every year.’ With 438 nuclear power stations and another 651 used for research purposes the potential is real. In Russia, many storage sites of strategic materials, nuclear and otherwise, are under-maintained and guarded, and staffed by scientists paid as little as £75 a month.

#### *Chemical Weapons*

Elsewhere, ‘there are approaching 500,000 tons of abandoned chemical munitions on the seabed, and the chances of a disaster increase, slowly, inexorably, every year as the process of decay continues.’ The North Channel, between Ireland and Scotland, is one such site, the Straits of Gibraltar, another. The US used a chemical weapon of mass destruction – Agent Orange – in the Viet-Nam war; its effects are still felt today in, for example, the births of deformed children.



### *Biological Weapons*

‘Biological weapons are... cheap to produce and deploy. A United Nations report in 1969 estimated the cost of an offensive against a civilian population at \$1 per square kilometre for biological agents, \$600 for chemical weapons to cover the same area; \$800 for nuclear warheads, and \$2,000 for conventional armaments.’ Biological weapons are known as the “Poor Man’s Atom Bomb.”

Despite having signed conventions against biological weapons, Russia is believed to hold, on an island in the Aral Sea, enough anthrax spores to kill the population of the world several times over.

One of the consequences of a biological attack could be ‘lasting changes of an unpredictable nature in the human environment.’ Such an attack would be silent – no explosions; it could take place from thousands of miles away, e.g. by injecting exported food with bacteria; it could go undetected for days while it spread among the population. You don’t need advanced technology to spread them. And they are easily concealed: ‘Facilities that could produce biological weapons may quite legally manufacture vitamins, antibiotics, vaccines, or even the innocent breakfast yoghurt. The equipment is essentially the same.’ ‘Some of the toxins that can be used as biological agents have entirely peaceful uses...’ Some are found naturally, such as botulism, one of the deadliest known poisons.

‘The First World War was chemical; the Second World War was nuclear, and... [a] Third World War... will be biological.’ (William Stewart, a UK government microbiologist and chief scientific adviser to the British government, speaking in 2001.) Depleted uranium is a highly carcinogenic weapon of mass destruction. In the first Gulf War, the anti-Saddam allies used 300 tons of it. (Jonathan Pilger, *The New Rulers of the World*, Verso, London, 2002, p.49)

(This section, *War by Terror*, draws mainly on Robert Hutchinson, *Weapons of Mass Destruction: the no-nonsense guide to nuclear, chemical and biological weapons today*, Weidenfeld and Nicholson, London, 2003. All the quotations are from it.)

### *Sanctions*

John Pilger, in *The New Rulers of the World*, (Verso, London, 2002), states, ‘Economic sanctions have probably already taken the lives of more people in Iraq than have been killed by all weapons of mass destruction in history.’ (p.8, citing John Mueller and Karl Mueller, in “The Methodology of Mass Destruction: Assessing Threats in a New World Order”, *The Journal of Strategic Studies*, Vol. 23, No.1, pp.163-187.) Before sanctions, Iraqis had 3,000 calories a day each; 92% had clean water, 93% enjoyed free health care.

(Pilger, p.92) UNICEF said that 6,000 Iraqi children die monthly because of sanctions. (Pilger, p.8) Hans von Sponeck, the senior UN official in Iraq, speaking of the *Oil for Food* programme said, 'Make no mistake, this is deliberate. I have not in the past wanted to use the word genocide, but now it is unavoidable.' (Pilger, p.59) Between 1991 and 1998, 500,000 Iraqi children above the anticipated rate died. In 1990, Iraq had one of the lowest child mortality rates in the world; by 2002, it had the highest. (Pilger, p.60) Pilger comments, 'Terror and barbarism are standard practice on our side; only the technology is different.' (Pilger, p.103)

Mrs. Madeleine Albright, then US ambassador to the UN, and later Secretary of State in the Clinton administration, in an interview on CBS TV, in a *60 Minutes* programme, called "Punishing Saddam," on 12 May 1996, was asked if the deaths of 500,000 Iraqi children through sanctions were worth the price. She replied, 'I think this is a very hard choice, but the price – we think the price is worth it.' (Pilger, pp.60-6) (She later expressed her regrets, saying that it was the biggest mistake of her life.)

#### *War by error*

'On the morning of 9 November 1979, US Air Force Minuteman missile crews were warned that a massive Soviet missile attack was en route to destroy US nuclear forces and the command structure. They prepared to launch their missiles, unaware that a training tape mistakenly loaded onto the USA's early warning system computers had generated the false alarm.' (Pilger, p.26) Six minutes passed before confirmation was received that there was no Soviet attack.

On 3 June 1980, a similar alert indicated an attack by 200 Soviet missiles against the US. A faulty computer chip was the cause. (Pilger, p.27)

On 26 September 1983, a Soviet early warning satellite spotted what seemed like the hot exhaust gases from a launch of US missiles from a base in the US mid-West. What it had actually detected was the rising sun. (Pilger, p.21) The commander of the Soviet rocket defence base in question was absent, having gone to a party and become drunk, and his place was taken by a junior officer who was under great personal stress as his wife was close to death from cancer, but he still salvaged the situation by a cool head.

On 25 January 1995, the launch, by Norway, off its coast, of a research rocket investigating the Aurora Borealis was mistaken by Russia for a Trident missile launch from a US submarine. The Russian defensive system went on nuclear alert. Only two minutes remained for a "launch on warning" decision to be taken, when it was realized that the rocket's trajectory was taking it away from

Russia into the Norwegian Sea. The Norwegian government, in accordance with agreed international protocols, had previously notified the Russian Foreign Ministry of the intended missile launch, but that ministry had failed to inform its Defence Ministry. (Pilger, pp.21-23)

‘The Pentagon has acknowledged there have been 32 such incidents in the three decades from 1950.’ (Pilger, p.145) These are like the above incidents, or when planes carrying nuclear warheads crashed. Other nuclear countries have likely had similar incidents, but without disclosing them.

#### *War by bribery*

Various senior Pakistani officials involved in their country’s nuclear weapons programmes sold information, equipment and training to North Korea, Iran and Libya. North Korea, in return, sold medium-range missiles to Pakistan. And North Korea’s current leader, Kim Jong Un, seems to regard his country’s nuclear arsenal as a personal fireworks display.

#### *The seemingly small things*

‘Landmines have killed or maimed more people than all nuclear, biological and chemical weapons combined. Every week, approximately 500 people, nearly all civilians, are killed or maimed by these devices. The 100 million landmines currently scattered over 62 nations world-wide have killed more people in times of peace than they did during the wars in which they were deployed.’ (From “Landmines: the Real Weapons of Mass Destruction”, *The Defense Monitor*, Vol.25, No.5, July 1996, published by the Center for Defense Information, Washington DC, USA)

#### *Learning from mistakes – or not*

When a war begins, it is not possible to predict its course reliably in any of several respects: -

*Who is likely to win.* When the Soviet Union invaded Afghanistan in 1979, one internationally-known commentator, Strobe Talbot wrote in *Newsweek*, ‘The outcome is not in doubt.’ In the context he meant the Soviet Union would win, and that did indeed seem as certain as anything could be – a superpower at war against mountain tribesmen armed with ancient home-made hunting rifles and shotguns. But those men had strong religious faith and did not care if they died fighting against Soviet “infidels.” Through sheer dogged persistence - and Charlie Wilson’s Stinger missiles - they defeated the Soviet Union. One study cited by Tom Clancy, a respected writer on military matters, is that, since the Industrial Revolution, nearly every war has been lost by the country that started it. In similar fashion, a study of assassinations showed that, in most cases, the outcome of an assassination was the opposite of what the assassin intended.

*How long a war will last.* When World War I began in August 1914, the accepted certainty was that, 'It'll be all over by Christmas.' But it was not until shortly before Christmas 1918 that it ended (although it continued until 1919 in Iraq, then known as Mesopotamia).

*Nearly every war sows the seeds of future war* because of the legacy of hatred, resentment, wounded pride and desire for revenge left in its wake. War begets war. World War I is a clear example. The United Nations states that, between the end of World War II in 1945 and the year 2000, some 250 wars were fought in the world. Where war is concerned, humanity does seem to be in a special class of slow learners.

*Many wars are fought for reasons which have little to do with their stated causes or objectives, such as: -*

- to restore democracy
- to free X or Y from tyranny
- to defeat terrorism
- the freedom of small nations
- to end all wars. This latter was stated about the Crimean war in 1855 (Arthur Carman, *Tawa Flat and the Old Porirua Road*, Wellington, New Zealand, p.52) in which Britain, France and Turkey fought to *deprive* Russia of naval access to the Black Sea; sixty years later, in the first World War in that same region, Britain, France and Russia fought against Turkey to *give* Russia naval access to the Black Sea. The same phrase about ending all wars was used to describe World War I.

Many wars derive from mutual reinforcement of male ego and insecurity: Hitler was disappointed with the outcome of the Munich agreement of 1938, and annoyed with Mussolini who had played a mediating role, saying of him, 'He has deprived me of my war.' Insecurity leads people to say that, 'If our enemies have such-and-such a weapon, then we must have it, too, or else the means of negating it.'

*No one can foretell what side-effects may follow, whether political, economic or technical: -*

*Political:* In 1857, a mutiny broke out among soldiers of the British East Indian Army. It was spontaneous, without clear-cut political or military objectives or leadership. But it was so intense that, at one time, the mutineers controlled about one-third of India. However, the British rallied their forces and after two years of often savage fighting brought the situation under control. Then they began assessing the situation and trying to ensure there was no recurrence; they did not want to lose India, the jewel in the imperial crown. One possibility was

to recruit many new divisions in Britain and ship them to India; their loyalty could be relied upon with certainty. But the cost would be astronomical, and Britain for long has had a fear of large standing armies. Someone suggested the new technology of the railroad: create a railroad system for India and then loyal troops could be moved quickly to any trouble-spots and nip problems in the bud. But the cost of that would also be huge. The solution was obvious: open up the railroad to civilian passenger and freight traffic and make it pay for itself. That was agreed and done. Indians took to rail travel with enthusiasm. As they did so, they began to learn that, whether they were Kashmiris from the north, Tamils from the south, Bengalis from the east, or Punjabis from the west, they had much in common, including resentment of British rule and a nascent desire for India to be free. What happened was that the railway system, put in place to control nationalist tendencies, actually led to their growth, and, ultimately, to the independence of India. The law of unintended consequences was at work.

*Economic:* Japan, from the beginning of the Meiji dynasty in 1867, became increasingly aggressive, militaristic and imperialistic. In 1905, it seized territory from Russia around Port Arthur and defeated its navy; in 1910, it captured Korea; then, in 1931, it seized Manchuria and set up a puppet regime, before going on to invade China in 1937. In World War II, it captured huge areas in the Far East, proclaiming itself as a liberator from Western colonialism. It called its enlarged empire the Greater East Asian Co-Prosperity Sphere. But, lacking domestic sources of iron ore, coal, oil or natural gas, Japan's victory depended entirely on the outcome of its naval war in the Pacific against the United States. When it lost that war, defeat followed. On average, two-thirds of Japan's cities suffered two-thirds destruction at the hands of the US air force. Close to three million Japanese were killed in the war. But Japan recovered and became the economic powerhouse of Asia. Through commerce, it achieved its goal of a Greater East Asian Co-Prosperity Sphere without the loss of one life.

*Technical:* The Roman Empire had the technology of cement-making, but the empire's collapse under barbarian invasions led to the loss of that knowledge, and it was not recovered until the eighteenth century.

*Something worth bearing in mind:* the five permanent members of the United Nations Security Council – Britain, China, France, Russia and the US - charged under the UN charter with promoting peace, are the world's five largest arms producers. When challenged, their reply is usually to say that, if they don't produce them, someone else will. This argument was used also by slave-traders.

## **GLOBAL WARMING, GLOBAL WARNING**

The Earth is warming, despite the sun being in an abnormally “cool” phase, which could revert to normal at any time. The sun’s output has not increased since 1978, so the warming during the past thirty years cannot be attributed to an increase in solar energy reaching the Earth.

Between 1880 and 2012, world surface temperature rose by 1.06 degrees Celsius. But the rate of increase almost doubled in the last half of that period. And, since 1979, land temperatures have increased each decade about twice as fast as ocean temperatures.

There are occasional breaks in the otherwise uninterrupted pattern of increase. For example, when it erupted in 1992, Mount Pinatubo in the Philippines ejected some ten billion tonnes (10 cubic kilometres) of magma and twenty million tonnes of sulphur dioxide. The aerosol cloud spread around the earth in two weeks and covered the planet within a year, blocking out some sunlight and reducing temperature. In 1992 and ’93, the average temperature in the Northern Hemisphere was reduced by between 0.5 and 0.6°C, and the entire planet cooled by from 0.4 to 0.5°C. But, despite that, the 1990’s were the hottest decade on record, and the 2000’s hotter still. While aerosols – particles of matter such as ash, soot, water vapour, etc. - remain in the atmosphere for only a short time, often falling to earth in a matter of days or weeks, carbon dioxide remains there virtually permanently.

Fifteen of the sixteen warmest years on record have occurred since 2000. The year 2015 was not only the warmest year on record; it broke the record by the largest margin yet. It was also the thirty-ninth consecutive year with above-average temperatures. As of July 2016, for the fifteenth consecutive month, global temperature departure from average was the highest since such records began in 1880. The year 2016 was still hotter than 2015. The Earth’s temperature is not just rising faster, but it is rising faster faster.

It might seem as if the future might be colder: ‘... shifts in the geophysiology of Earth [mass movements of tectonic plates pulling continents around] created a new global climate, an ice age, one with a hundred-thousand-year cycle. After some ninety thousand years of glaciation, the ice retreats for a period of some ten thousand years, and then returns, repeating the pattern. This sequence of glaciation followed by brief inter-glacial warming has persisted now for three million years, right up to our own time.’ (Brian Swimme and Thomas Berry, *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era, A Celebration of the Unfolding of the Cosmos*, Arkana Penguin Books, London, 1992, pp.124-125) It is now ten to fourteen thousand years since the last ice age, so, according to the above, we are overdue a new ice age. But a new glacial

period is not expected within the next 50,000 years if atmospheric CO<sub>2</sub> concentration remains above 300 ppm. (It is above 400 ppm since 2015 and increasing at 2 ppm annually.) Hansen writes, ‘human-made climate forcing is not coming on just a bit faster than natural forcings of the past; on the contrary, it is a rapid powerful blow, an order of magnitude greater than any natural forcings that we are aware of’ (Hansen, *Storms*, p.274), and ‘there is no chance whatsoever that the sun can cause Earth to go into a new Little Ice Age – the numbers... confirm that human-made forcing now overwhelms the natural climate forcing.’ (Hansen, *Storms*, p.107) Humans are the driving force behind climate change.

Evidence of global warming comes from a strange diversity of sources: -

- To avoid Somali pirates ‘The owners of very large crude carriers (VLCCs) refused to use the Suez Canal. Vessels were sent around the Cape of Good Hope, or through the Russian Northeast Passage, navigable without the aid of ice-breakers for the first time in history as a consequence of global warming.’ (Adrian Tinniswood, *Pirates of Barbary: Corsairs, Conquests and Captivity in the 17<sup>th</sup> century Mediterranean*, Jonathan Cape, London, 2010, p. xv)
- The director of the Botanic Gardens in Kew, London, said, ‘The world is heading for disaster.’ He pointed out that, in 2000, Russian scientists found open water rather than ice at the North Pole. But that is only the beginning: Arctic sea ice has been reducing in area since 1950. Climate models expected it to reduce by half in a hundred years, i.e. by 2050. But, in 2007, that point had already been reached, with an area of about four million sq.km. of ice as against an expected seven to eight million. (Hansen, p.167; Lovelock, *Gaia*, p.42) Polar bears are already finding it difficult to obtain sufficient food for survival: they need the sea to freeze so that their principal prey, seals, will come to air holes in the surface to breathe.
- Average arctic temperatures have been increasing at almost twice the rate of the rest of the world in the past 100 years. ‘There is a strong consensus among Arctic researchers that we are faced with a clear and imminent threat to the continued existence of summer sea ice in the Arctic. I have found no Arctic researcher who believes that sea ice will survive if the world continues with business-as-usual fossil fuel use. The only question seems to be how fast the ice would be lost and how dramatic the feedbacks on tundra, methane hydrates and Greenland would be.’ (Hansen, p.168)

- In the face of denial by the fossil-fuel industry, insurance companies are worried, describing global climatic change as the single most important issue facing them today. They face larger and more frequent pay-outs for violent storms and coastal and other flooding. During the last glacial period, 14,000 years ago, when the melt came, temperatures rose about 5 degrees Celsius and sea-levels rose by 100 metres. (Lovelock, *Gaia*, p.149) Anything on a scale close to that would destroy coastal cities and towns, the homes of a large proportion of the human population. In the last century, sea levels have risen by 20 centimetres. But global warming in the Arctic is twice as fast as elsewhere on the planet. Sea ice is a powerful regulator of global climate and such a change would have a global impact.
  
- In Greenland, 'the area with melting has almost doubled since the beginning of satellite measurements in the late 1970s.' (Hansen, p.86) A British scientist used to visit Greenland on his research and stay in a coastal town which celebrated an annual festival for the break-up of the ice that blocked its harbour in winter. It marked the resumption of the fishing season but came to be held earlier and earlier each year. Now the festival no longer takes place at all because the port doesn't freeze any more. This allows trawlers to fish all year round - but with greater danger because of more icebergs. Between 2001 and 2006, an estimated one trillion tons of Greenland ice has melted. If all of Greenland's ice were to melt, sea levels would rise by seven metres.

The *albedo* [whitening, from Latin *albus*, white] effect is especially significant in Greenland. As ice melts, it exposes the underlying rock, which is black. This attracts and retains heat, melting more ice thus exposing more rock, and so on it goes, with an inbuilt multiplier effect. A similar process is at work when sea ice melts. Greenland is losing more than 100 cubic km. of ice a year and sea level is rising at 3 cm a year. One potential effect of this is that cold meltwater from Greenland, sinking to the bottom of the Atlantic, might divert or halt the warm Gulf Stream which flows north-east from the Caribbean to Western Europe. This could result in Ireland, for example, coming to have a climate like that of Newfoundland which has icebergs floating in the sea off its coast in winter.
  
- In the Himalayas, Hindus several decades ago built a shrine to mark the source of the River Ganges, but it is now several kilometres downstream from the source, because the glacier from which the river springs has receded by that much.



- ‘The current... climate forcing already is causing a notable recession of mountain glaciers around the world, affecting freshwater availability, shifting climate zones, increasing fires and flooding, promoting the loss of Arctic sea ice and vulnerable coral reefs, accelerating mass loss from Greenland and Antarctic ice sheets with rising sea level, and putting pressures on many species, leading to a danger of mass extinctions.’ (Hansen, p.100) Scientists predict that, if present trends continue, glaciers will all have melted by about 2060. (Hansen, Storms, p.165) The snows of Kilimanjaro in Tanzania, already shrinking, are becoming mere rock and shale instead.

A feedback process is at work, with melting feeding the factors that cause it: -

- ‘Amplifying feedbacks that were expected to occur only slowly have begun to come into play in the past few years. These feedbacks include significant cuts in ice sheets, release of greenhouse gases from melting permafrost and Arctic continental shelves, and movements of climatic zones with resulting changes in vegetation distribution.’ (Hansen, p.74) The problem is that ‘Sea ice reflects about 50 per cent of the solar radiation it received back into space. By contrast, water reflects less than 10 per cent.’ (Peter Wadhams, *Farewell to Ice*, Allen Lane, London, 2016) He goes on to say, ‘the central basin of the Arctic will be ice-free, and I think this is going to happen in the summer of 2017 or 2018’ as against previous expectations of sometime between 2030 and 2050. The less sea-ice, the more absorption of the sun’s heat by the ocean, and the vicious circle spins a little faster. Feedback is particularly powerful in the Arctic.
- Due to warming seas, ‘most of the ice shelves around Antarctica were melting from below at a rate of several meters a year.’ (Hansen, p.86) This is in addition to increased melting from above due to higher summer air temperatures.
- ‘Large amounts of methane ice are found today in arctic tundra, and especially beneath sediments on the seafloor of the Arctic Ocean.’ (Hansen, p.149) A TV documentary illustrated the issue of methane by a simple experiment. A man in a punt in Siberia poked at the bottom of a pond with a four metre long metal pipe. This released methane from melting permafrost into a plastic bag on the pipe’s end. He then lit a cigarette lighter and burned off the gas. Global warming may increase that process many times over. Evidence suggests that global warming has done it before. (Hansen, p.162)

- Each litre of methane hydrate, when heated, produces 160 litres of methane gas. (Hansen, p.162) It's a greenhouse gas, and, over a period of a decade, it oxidises to carbon dioxide. It happened before. (Hansen, p.163) Methane is twenty-three times more powerful than carbon dioxide as a heater of the atmosphere. (Peter Wadhams, *Farewell to Ice*, Allen Lane, London, 2016)

The Earth is a big place, and changes only very slowly; there's a lot of inbuilt inertia. But the momentum is already there, as far as global warming is concerned. The change has already begun and is accelerating. Trying to halt that is like trying to halt a very large crude carrier by hoisting sails to act as a brake. But far from trying to halt the carrier we are actually accelerating it. Accords such as that signed in Kyoto, Japan, in 1997, were mostly not adhered to by the signatories. Japan itself, which made an effort greater than most and didn't fudge its figures, actually *increased* its CO<sub>2</sub> emissions by 9% instead of reducing them by 6%. (Hansen, *Storms*, p.206) The United States, the world's biggest single producer of CO<sub>2</sub> refused to sign the accord.

Ireland signed it, but its fulfilment reflects an ambiguous commitment. From a baseline of emissions of 55 million tonnes of CO<sub>2</sub> in 1990, Irish emissions went up to 70 million by 2000, down to 68 million by 2005, to 57.5 million in 2011 and then up to 58.5 million by 2012. The graph seems to reflect the three stages of the Irish economy – Celtic Tiger, the crash of 2008, and the beginnings of a recovery in 2011. Agriculture is the problem area: the trouble is mostly about burping and farting farm animals! Transport has reduced its carbon emissions, prodded by taxes on them. Laura Burke of the EPA warns, 'Ireland is not currently on the right track to meet its 2020 targets, nor is it on the right emissions trajectory to meet future EU targets or our national 2050 decarbonisation goals.'

The 2015 Paris accord on climate change aimed to prevent global warming of more than 2 degrees Celsius. It requires for ratification the approval of fifty-five countries producing not less than 55% of carbon dioxide. China and the US, producing between them 40% of the world's carbon dioxide, agreed in September 2016 to carry out its terms, enabling the agreement to come into force in November 2016. Ireland is one of only two EU countries which have not started the ratification process. Because of the importance of its agriculture industry, it won concessions from the EU, which is treated as a single unit for the purposes of implementation, but is looking for more. In November 2016, another climate conference (COP22) was held, this time in Marrakesh, Morocco, as a follow-up to Paris. Its purpose was to give more teeth to that accord, such as finding \$100 billion a year to pay for reaching its goals, but its achievements fell short of most expectations.

## POPULATION

In 9,000 BCE, world population was about 1 million. It reached 1 billion by about 1800, 2 billion by 1927, 3 by 1960, 4 by 1974, 5 by 1987, 6 by 1999 and 7.3 in 2016. To grow from 1 billion to 2 took 123 years, from 2 to 3 took 33 years, from 3 to 4 took 14 years, from 4 to 5 took 13 years, and from 5 to 6 billion only 12 years.

Doomsday scenarios about population have been unfolding since the 1950's, reaching a high with Dr. Paul Ehrlich's book, *The Population Bomb*, in 1968. (His doctorate was in the study of butterflies.) In the 1960's, BBC TV broadcast a programme under the title *Standing Room Only*; we were told that such was the future that awaited us before long if we didn't mend our ways. But another scientist stated that if everybody in the world moved to Texas, we would have about 1,200 sq. ft. of ground each. (Joel L. Swerdlow, 'Population: One in Six Billion', *The National Geographic*, October 1998, p.4)

Numbers alone cannot give a realistic picture of the situation; it is a good deal more complex than that. Consider the situation in various parts of the world; some examples follow.

### *Gendercide*

An article under that name in *The Economist*, (6 March 2010, p.4) described it: -

*Killed, aborted or neglected, at least 100,000,000 girls have disappeared.*

Imagine you are one-half of a young couple expecting your first child in a fast-growing poor country. You are part of the new middle class; your income is rising; you want a small family. But traditional mores hold sway around you, most importantly in the preference for sons over daughters. Perhaps hard physical labour is needed for the family to make its living. Perhaps other sons may inherit land. Perhaps a daughter is deemed to join another family on marriage, and you want someone to care for you when you are old. Perhaps she needs a dowry.

Now imagine that you have had an ultrasound scan; it costs \$12, but you can afford that. The scan says the unborn child is a girl. You yourself would prefer a boy; the rest of your family clamours for one. You would never dream of killing a baby daughter as they do out in the villages. But an abortion seems different. What would you do?

For millions of couples, the answer is: abort the daughter, try for a son. In China and northern India more than 120 boys are being born for every 100 girls.

Nature dictates that slightly more males are born than females to offset boys' greater susceptibility to infant disease. But nothing on this scale.

For those who oppose abortion, this is mass murder. For those such as this newspaper, who think abortion should be 'safe, legal and rare' (to use Bill Clinton's phrase), a lot depends on the circumstances, but the cumulative consequence for societies of such individual actions is catastrophic. China alone stands to have as many unmarried young men – 'bare branches' as they are known – as the entire population of young men in America. In any country rootless young males spell trouble; in Asian societies, where marriage and children are the recognized routes into society, single men are almost like outlaws. Crime rates, bride trafficking, sexual violence, even female suicides are all rising and will rise further as the lopsided generations reach their maturity.

It is no exaggeration to call this gendercide. Women are missing in their millions – aborted, killed, neglected to death. In 1990, an Indian economist, Amartya Sen, put the number at 100,000,000; the toll is higher now. The crumb of comfort is that countries can mitigate the hurt, and that one, South Korea, has shown the worst can be avoided. Others need to learn from it if they are to stop the carnage.

#### *The dearth and death of little sisters*

Most people know that China and northern India have unparalleled large numbers of boys. But few appreciate how bad the problem is, or that it is rising. In China, the imbalance between the sexes was 108 boys to 100 girls for the generation born in the late 1980's; for the generation of the early 2000's, it was 124 to 100. In some Chinese provinces, the ratio is an unprecedented 130 to 100. The destruction is worst in China but has spread far beyond. Other East Asian countries, including Taiwan and Singapore, former communist countries in the western Balkans and the Caucasus, and even sections of America's population (Chinese- and Japanese-Americans, for example): all these have distorted sex ratios. Gendercide exists on almost every continent. It affects rich and poor; educated and illiterate; Hindu, Muslim, Confucian and Christian alike.

Wealth does not stop it. Taiwan and Singapore have open, rich economies. Within China and India the areas with the worst sex ratios are the richest, best-educated ones. And China's one-child policy can be only part of the problem, given that so many other countries are affected.

In fact, the destruction of baby girls is the product of three forces: the ancient preference for sons; a modern desire for smaller families; and ultrasound

scanning and other technologies that identify the sex of a foetus. In societies where four or six children were common, a boy would almost certainly come along eventually; son preference would not need to exist at the expense of daughters. But couples now want two children – or, as in China, are allowed only one – they will sacrifice unborn daughters to their pursuit of a son. That is why sex ratios are most distorted in the modern, open parts of China and India. It is also why ratios are more skewed after the birth of the first child: parents may accept a daughter the first time round but will do anything to ensure their next – and probably last – child is a boy. The boy-girl ratio is above 200 for a third child in some places.

### *How to stop half the sky crashing down*

Baby girls are thus victims of a malign combination of ancient prejudice and modern preferences for small families. Only one country has managed to change this pattern. In the 1990's, South Korea had a sex ratio almost as skewed as China's. Now, it is heading towards normality. It has achieved this, not deliberately, but because the culture changed. Female education, anti-discrimination suits, and equal rights rulings made son-preference seem old-fashioned and unnecessary. The forces of modernity first exacerbated prejudice – then overwhelmed it.

But this happened when South Korea was rich. If China or India – with incomes one quarter and one-tenth South Korea's levels – wait until they are as wealthy, many generations will pass. To speed up change, they need to take actions that are in their own interests anyway. Most obviously China should scrap the one-child policy. The country's leaders will resist this because they fear population growth; they also dismiss Western concerns about human rights. But the one-child limit is no longer needed to limit human fertility (if it ever was: other East Asian countries reduced the pressure on population as much as China.) And it massively distorts the country's sex ratio, with devastating results. President Hu Jintao says that creating 'a harmonious society' is his guiding principle; it cannot be achieved while a policy so profoundly perverts family life.

And all countries need to raise the value of girls. They should encourage female education; abolish laws and customs that prevent daughters inheriting property; make examples of hospitals and clinics with impossible sex ratios; get women engaged in public life – using everything from television newsreaders to women traffic police. Mao Zedong said 'Women hold up half the sky.' The world needs to do more to prevent a gendercide that will have the sky crashing down. (End of quote from *The Economist*.)

Is it not astonishing that while the world recoils from the mass extermination of six million Jews for no other reason than that they were Jews, so little notice is taken of the mass extermination of a hundred million girls – and how many more since 1990? – for no other reason than that they were girls? What kind of heartless and uncaring society are we creating? And if we lose respect for human life to such an extent, are we not undermining society itself?

### *China*

After the Communists came to power in 1949, Chairman Mao Zedong urged women to have more children ‘to make the revolution mighty.’ Then came the “Later, Longer, Fewer Campaign” for smaller families; by the late Seventies this had reduced family size from six to three. Then, in 1980, the Communist Party “requested” parents to limit their children to one. That “request” was backed up by forced sterilization and abortion, even of fetuses up to forty weeks old.

Some exceptions were made, for example, in rural areas, where parents needed children to work the land. Other loopholes were created and extended by those with money or political connections.

There were many problems. A sole child, fussed over by two parents and four grand-parents, was easily spoiled, and behaved accordingly; such children became known as ‘the little emperors.’ Another problem arose when parents lost their one child. In some places, such as Sichuan Province, they could not have a second, because both had been compulsorily sterilized after the birth of their one child. In a country with minimal social welfare, and where children are expected to care for their parents in old age, those parents face a bleak future, with no children, no grand-children and no support in their later years.

This was illustrated dramatically when an earthquake hit Sichuan in 2008, killing 70,000 people; 8,000 families lost their only child, mostly when badly-built schools collapsed. Everything in Chinese society is geared towards marriage and the family, so to be permanently childless is seen a huge loss, leaving the elderly with no one to care for them because state pensions are minimal. It also means rock-bottom social status. They are called *shidu*, a term reflecting this. There are a million of them.

A different consequence is that girls born illegally, above the one-child limit, numbering some thirteen million, are denied legal recognition of their existence. They are refused the documentation necessary to go to school, be admitted to hospital, get a job, or marry.

Another consequence is a large surplus of males over females because of a cultural preference for boys over girls. (30,000,000 is one figure mentioned.) Those young men will have little or no chance of marriage, leading to prostitution, rape or other crimes. The male to female ratio among children under five was broadly 119 boys to 100 girls, but 135 in Hainan and 140 in Guangxi Provinces. The lack of women resulted in kidnapping, trafficking and a thriving prostitution industry. (Quoting from Ren Yuling, a delegate to the Chinese People's Political Consultation Committee; see *The Tablet*, 16 March 2002, p.32.) One traditional way of reducing a surplus of young unattached males is war.

The one-child policy was eased in 2013, as recognition dawned that the long-term consequences were a threat to prosperity, and therefore to internal security. The Communist Party, lacking democratic legitimacy, stays in power because, so far, it has delivered the goods in terms of material prosperity. Without that, who knows? 'Very soon, China's population will be too male, too old and too few for continued prosperity.' By about 2035, the country will have only 1.6 working persons to support each retiree. By 2050, one in three Chinese will be retired. Having adopted forced sterilization and abortion, the temptation will be to introduce forced euthanasia under one guise or another. Will that be accepted in view of the millennial Chinese tradition of respect for the elderly?

But the new two-child policy appears not to be working either. Polls suggest that most Chinese now want only one child. More than one is too stressful and too expensive, people say. The easing of the one-child policy produced an extra child in only 15% of families. The first generation of Chinese women with a choice about their fertility has opted for 'independence, foreign holidays and the shopping mall' rather than a second child.

Furthermore, infertility has risen four-fold, to 13.5% of the population, in the last three decades. This has links, as yet unproven, to a dire environmental situation. For example, in Beijing in the winter of 2013, millions of children had to stay away from school and wear face masks if they ventured out onto streets that were dark at noon because of smog. Birth rates in China are now below replacement levels. 'A country with so few young people loses creativity and loses hope,' said a doctor in a Kunming hospital for the elderly. (Most of the above is from Mei Fong, a Pulitzer-winning former China reporter for *The Wall Street Journal*, in her book, *One Child: the Story of China's Most Radical Experiment*, Oneworld, London, 2014)

## *Europe*

2.1 children per woman are necessary to sustain population. In Europe, rates have been below that since 1975. Here are some examples of average number of

children per family: - France 1.9, Norway 1.81, Sweden 1.75, UK 1.74, Netherlands 1.73, Germany 1.37, Greece 1.29, and Spain the lowest in the world at 1.2. At this rate it is predicted that Europe will lose 25% of its “natural population” by 2060. (William Reville, ‘Our family units are shrinking too fast’, *The Irish Times*, 1 February 2007) The age pyramids of France, Spain and Italy on the one hand and Algeria, Morocco and Turkey on the other are each the opposite of the other. The former three are traditionally Catholic countries, while the latter three are Islamic; that creates potential for social friction in the Mediterranean basin, anticipated in the developing migrant crisis.

About 1968, as the Pill became widely available, a demographic shift began so that, by 1998, fertility was below replacement levels in fifty-one countries of the world. Those countries embrace 44% of the world's population and include Germany, Spain, Italy, Hungary, Russia, Bulgaria, Latvia, Estonia and Ireland. Ben Wattenberg, of the American Enterprise Institute, writing in the *Foreign Affairs Journal*, (September 2001), stated that ‘Never have birth and fertility rates fallen so far, so fast, so low, for so long, all over the world.’

Europe’s proportion of world population is 13% but likely to drop to 7% by 2025. Why has it fallen so much? The answer appears to lie in the changed status of women, women now in the work force, long daily commutes to and from work, work pressures, career ambitions and poor quality or high-cost child-care facilities. As in China, ‘independence, foreign holidays and the shopping mall’ win out over a second or maybe even a first child. Europe needs babies. It has a choice, either babies or an increasing standard of living – for a time. It has chosen the latter, while immigrants from the Third World are content with a lower standard and have more babies. At the moment, European workers outnumber retirees by about four to one. That will fall to less than two to one by 2050. Health care and pension systems will not be able to cope. The number of people in the world aged sixty years and over is increasing at a rate of 800,000 a month, due to higher life expectancy and declining fertility rates. (BBC radio programme.)

‘However, there is a deeper problem, and it is rooted in the overall societal model we have adopted in the West, based on extreme liberalism and moral relativism. We refuse to value any substantive thing over another and are insidiously exhorted to feel ashamed of our European heritage. The value of individual rights is trumpeted while the responsibilities that automatically accompany rights are glossed over. Increased standards of living in a materialistic culture also blunt enthusiasm for making sacrifices for the sake of children.’ (From Richard Koch and Chris Smith, *Suicide of the West*, Continuum, London, 2009) We are sleepwalking into a huge problem. To quote the American historian, Will Durant, ‘A great civilization is not conquered from



without until it has destroyed itself from within.’ ‘A society which fails to replace itself is a deeply unhealthy one, self-absorbed, materialist, with radically reduced horizons. A product of globalization, it is, paradoxically, more concerned with our own patch than with the complex, fragile and all too often unequal globe on which we live.’ (Gerard T. Wrixon, ‘Economic Development and Social Change,’ *The Furrow*, October 2000, p.546)

### *Ireland*

The chart of Ireland’s population is highly exceptional. Is there any other country on Earth whose population today is lower than it was in the 1840’s?

In 1841, the population of the island of Ireland was 6.8 million; in 2016, it was 6.56 million - 4.7 million in the Irish Republic and 1.86 in Northern Ireland. From the Great Famine of 1845-47, when one million people died of hunger and another million emigrated, it continued to fall in the Republic until 1961. With new economic policies, it began to rise, dropping again in the late eighties through emigration, but recovering in the 1990’s.

In 1996, family size was 2.2 children; ten years later, it had fallen to 1.4. Those years were those of the Celtic Tiger, when Ireland was more prosperous than at any time in its history. Prosperity, it seems, is the most effective contraceptive. Immigration is what is now making Ireland’s population grow. In 2001, the population grew by 58,000, of which natural population increase was 28,000. In the same year, the number of immigrants exceeds emigrants by 30,000.

People are postponing marriage until their thirties, and are living longer: life expectancy went from 66 for a man and 67 for a woman in the late Fifties, to 80 for a man and 82 for a woman in the 2010’s. Average age went from 35.9 to 37.3 between 2010 and 2016.

### *Italy*

In 2007, the average family had 1.3 children, and average class sizes were 11. In 2000, Italy estimated that it would need three million immigrants before 2010 to sustain its economy.

### *Japan*

The contraceptive Pill, which was illegal from the 1960’s, was legalized in 1999 after a nine-year public debate. It was banned because of fears that its use would lead to promiscuity and the spread of sexually transmitted infections, and that estrogen from it would find its way into the public water supply, lowering men’s fertility. Under the new law it will still not be available on the country’s public health service. Japanese culture gives high regard to what is considered

to be “natural,” and this led to public unease about the Pill. Controlling fertility by chemical means is seen as another form of surrender to male domination, a violation of the ecology of the woman’s body and an abdication of self-control. In Japanese tradition, people are meant to live in harmony with nature, respecting its dynamics, not seeking to control them; person and nature are symbiotic. That applies especially to the human body, the part of nature most intimate to the person. Paradoxically, in view of the above, abortion, legalized in 1948, is the preferred means of family limitation, with condoms in second place.

It is increasingly common among young Japanese couples to decide not to have children at all, and about one-third of men between the ages of 18 and 30 say they intend not to marry. Japan has a rapidly ageing population and a diminishing base of young people to sustain the economy, the social welfare system and to see to the care of the elderly.

Japan seems to have lost the will to reproduce. That is a vote of no confidence in itself, a form of national suicide.

### *South Korea*

Abortion is illegal, but widely practised without sanction. About one-third of a million abortions take place every year. Like Japan, Korea has an ageing population with a small proportion of young people whose taxes provide the social support for the elderly and who increasingly resent this role imposed on them by choices their parents have made.

### *Russia*

President Vladimir Putin, speaking to the State Duma in Moscow in 2000, said that, if prevailing demographic trends continued, Russia would lose 22 of its 146 million people in the coming fifteen years. (Maura Reynolds, *The St. Petersburg Times*, 11 July 2000) Russia is the only industrialized country where life expectancy is falling, due to alcoholism, smoking, pollution and a scarcity of fresh meat, fruit and vegetables. Consumption of vodka is an average twenty litres per person per year, not counting illegal home brewing. In the early years of this millennium, life expectancy for a man was 58 and for a woman 65. The average Russian woman will have from eight to twelve abortions in her lifetime.

### *Spain*

By the year 2020, if present trends continue, Spain will have the oldest population in the world, with more than half the people over sixty-five. It now has the lowest birth-rate in the world, with only 1.2 children per woman. About half of those between the ages of 15 and 49 say they intend having no children.

Rates of contraception, abortion and divorce have soared. (Austen Ivereagh, 'The new face of Spain,' *The Tablet*, 6 January 2001, pp.8-9) Deaths exceed births.

### *Zambia*

In the early 1970's, the National Assembly, in one day, with only nine members present, passed an abortion bill through all four of its parliamentary stages and received the presidential signature. It is widely believed that this was a condition demanded by the International Monetary Fund for the grant of a loan.

### *Other dimensions to the population problem*

If we say there are too many people in the world, do we mean too many Irish people or too many Africans, Asians, Muslims or poor? If the latter is what we mean, are we saying in effect, 'Let's get rid of poverty by getting rid of the poor'? That view was held by Robert Malthus, whose ideas influenced Charles Darwin, among others. In his *Essay on the Principle of Population*, he wrote, 'The power of population is indefinitely greater than the power in the earth to produce subsistence for man' because an increase in a nation's food production improved the well-being of the populace, but the improvement was temporary because it led to population growth, which in turn restored the original per capita production level. Fewer poor people would mean less poverty. Margaret Sanger a pioneer of contraception – she popularized the term "birth control" – wrote that, 'The most merciful thing that the large family does to one of its infant members is to kill it.' In *Woman and the New Race*, on "The Wickedness of Creating Large Families" she wrote that we should apply 'a stern and rigid policy of sterilization and segregation to that grade of population whose progeny is tainted, or whose inheritance is such that objectionable traits may be transmitted to offspring.' (Chapter 6; see her "Plan for Peace" in the *Birth Control Review*, April 1932, pp. 107-108) Tim Pat Coogan, in his book, *The Famine Plot*, argues that Britain was in large part responsible for the Great Famine in Ireland (1845-47), and in fact engineered the food shortage in one of the earliest cases of ethnic cleansing. So strong was anti-Irish sentiment in Britain that in the British Parliament the famine was referred to as "God's lesson." Such ideas were regarded at the time as scientific and enlightened. The racism of fear is racism even if it more understandable than the racism of hatred. Fear of over-population is often voiced in the same breath as fear of immigration.

Pope Francis has written, 'To blame population growth instead of extreme and selective consumerism on the part of some, is one way of refusing to face the issues. It is an attempt to legitimise the present model of distribution, where a minority believes it has the right to consume in a way that could never be

universalized, since the planet could not even contain the waste product of such consumption. Besides, we know that approximately one-third of all food produced is discarded, and whenever food is thrown out it is as if it were stolen from the table of the poor.’ (His encyclical letter *Laudato Si’*, *On Care for our Common Home*, 24 May 2015, n.50) One estimate is that the developed world uses twenty-five times as much of the world's resources per head as the underdeveloped world. Mahatma Gandhi said that there was enough in the world for everyone's need, but not enough for everyone's greed. Sharing the goods of the world may be at the heart of the population question, the tricky part where the real challenge and the real resistance lies.

Debate about population and development is often a hen-and-egg question: which comes first - development or population limitation? The question needs to be treated as part of a package, including general health care, education, the status of women, peace, public spending and fairer distribution of world resources. Fiona Fox writes, ‘The key to population control is not contraception but social and economic development, and, in particular, the education of women. At the UN Population and Development Conference in Cairo in 1994, there was consensus that, in societies where women were educated and empowered, they have fewer children and they have them later in life.’ (“It's time we shared”, *The Tablet*, 19 September 1998, p.1209) And, ‘There isn't any place where women have had the choice that they haven't chosen to have fewer children.’ (Beverly Winikoff, "Population: One in Six Billion", *The National Geographic*, October 1998, p.39)

## ABORTION

There has been a huge shift of ethical boundaries on this issue over the last two to three generations. Rabbi Jonathan Sacks spoke of ‘The gradual transformation by which sin becomes immorality, immorality becomes deviance, deviance becomes choice and all choice becomes legitimate, is a profound redrawing of our moral landscape and alters the way we see the alternatives available to us.’ (*The Persistence of Faith* [The Reith Lectures], Weidenfeld and Nicholson, London, 1991, p.50) People have practised abortion in every age of history, just as they have lied, stolen or murdered. The difference is that it is now considered not unethical to do so. From being regarded almost universally as wrong, it has come to be seen not simply as right but as a right.

People can get used to anything – infanticide, torture, slavery: -

- The ancient Greeks, the people who gave us philosophy and logic, democracy and the Olympic Games, practised infanticide for centuries; likewise the Romans, who gave us law, government and engineering.
- A prominent figure of the Enlightenment, Empress Maria-Theresa of Austria, ordered the compilation and publication of a handbook of torture for use in criminal cases.
- Philosophers of the Enlightenment, David Hume and John Locke, sacrificed principle to profit through their financial investments in the slave-trade. Voltaire, seen as the great champion of human liberty, believed that Africans were a different species who mated with orang-utans; he invested profitably in the slave-trade and accepted with some delight the “honour” of having a slave-trading ship named after him. (See Kenneth N. Addison, *We hold these Truths to be Self-evident*, 2009, p.46)

In an infamous case in 1857, Dred Scott, an enslaved African American man sued for his freedom and that of his wife and their two daughters. The US Supreme Court under Chief Justice Taney decided 7–2 against him, finding that neither he nor any person of African ancestry could claim citizenship in the US, nor could he bring a suit in a federal court, and freeing him would improperly deprive his owner of his legal property – all this even though Scott was living in a free state. He was considered to be property, and this was protected by the Fifth Amendment to the Constitution.

One of the negative aspects of globalization in our own time has been the phenomenal increase in slavery. It is predominantly women who are sold, and it

is done for commercial sexual exploitation. One estimate is that more women and children were trafficked from Asia in the 1980's than all of the people sold into slavery from Africa in the four hundred years of the African slave trade. The secretive nature of this underground trade makes it difficult to know exactly how many people are affected. However, counter-trafficking non-governmental organizations estimate that about 1,500,000 women and girls are sold into slavery and trafficked for the sex industry each year. They further estimate that 800,000 of those women move through countries of the European Union, including Ireland. (UN figures are lower than these.)

If enough people do something, if it becomes a statistical norm, then it may well be regarded and accepted as normal, or “natural.”

In debates on abortion, there are two factors which rarely receive attention. The first is normally responded to by a wall of denial, a simple refusal to look reality in the face and call it by name. That is to look at what is actually done to an unborn child in being aborted; it is as if it disappears painlessly like a puff of smoke in the wind. Anyone who makes an effort to find the truth will learn that such is far from the case. The second is the impact that abortion has on the child's father. In an age which speaks so much of sexual equality, the rights of the father are usually ignored. It is as if he had nothing to do with the matter and no legitimate say in it. In some cases, he is not informed, even after the event, that his child has been aborted. This dismissal of his paternity as irrelevant exacts a price; actions have consequences – that's what *karma* means. A World Health Organization study of suicide in one hundred countries showed that, in all of them, male suicide substantially outnumbers female. In Ireland, in all age categories from adolescence to the eighties, it is by a factor of four to one. Doris Lessing, who has written extensively about the role of women in society, said, ‘It has now become socially acceptable to consider men domestically incompetent, useless in the kitchen, hopeless fathers, unreliable breadwinners, and generally a dispensable sector of the human race.’ If one adds to that the dismissal of their fatherhood, should it surprise anyone that some men internalize this verdict on themselves and take their own lives?

## EUTHANASIA

Once abortion is accepted as an ethically legitimate choice, there is no logical reason - there are political reasons - for refusing to accept euthanasia as ethical. What ethical difference is there between claiming a right to terminate human life at its beginning and at its end? Perhaps the only real difference is that infants in the womb cannot vote while the elderly can. What adults would vote for euthanasia, knowing that they could be the ones to be euthanized? Equally well, what unborn child would not opt for life if it had the choice?

A significant number of countries in Europe, and states of the United States, have legislated for euthanasia under a variety of regimes. Distinctions are made between active and passive euthanasia, between physician-assisted suicide and deliberate killing. The Netherlands was one of the first countries to do so. However, by February 2010, public attitudes there had changed to such an extent that a citizens' initiative demanded that all Dutch people over seventy who feel tired of life should have the right to professional help in ending it.

### *Nazi Germany*

The Nazi government's eugenics programme ran officially from September 1939 to August 1941, during which some 70,000 people were killed at various extermination centres located at psychiatric hospitals in Germany and Austria. The unofficial continuation of the policy led to additional deaths by medical means resulting in 93,521 beds emptied by the end of 1941. (Nazi Germany shared with the Soviet Union, e.g. in the *Gulag*, a passion for exactitude in statistics.) Historians estimate that twice the official number of victims may have perished before the end of the war. Secret killing of infants began in 1939, and increased after the war began. By 1941, more than 5,000 children had been killed. Official policies of extermination of those deemed physically or mentally unfit were gradually adopted by most of the German medical profession, and criteria were progressively widened to include those considered to be an economic burden on the state. Jews, of course, were killed simply for being Jews. Everything done in this matter was legal.

This practice continued in Bavaria even after the end of the war, despite the nullification of Nazi legislation. One doctor in the Kaufbeuren-Irsee state hospital in Bavaria, asked why he continued killing children despite Nazi laws being scrapped, replied simply, 'No one told us to stop.' In December 1946, an American military tribunal prosecuted twenty-three doctors and administrators for their roles in crimes against humanity such as the systematic killing of those legally designated as "unworthy of life."

### *Switzerland*

There are reports from Switzerland as far back as the 1970's, of doctors terminating the lives of elderly patients without their consent by injecting them in an artery with air, sometimes, it seems, for no other reason than to free up a bed for another patient. Is it inconceivable that, in the future, people will accept the killing – it will be called something else, anything but killing – of the elderly, supposedly on grounds of kindness, “putting Granny or Granddad out of their misery”, “giving them a happy release”, “putting them to sleep” etc.? People can get used to anything.

### *United States*

If someone is described as a “vegetable”, or being in a Perpetual Vegetative State (PVS), that lends itself to the suggestion that ending their life cannot be placed on a par with that of an “ordinary” person. One such case came to prominence in the United States early in 2005. It involved a young woman called Terry Schiavo. It was said of her that she was in a ‘PVS,’ a phrase that sounds like a propaganda term rather than a descriptive one. It made a judgment about a person, a human being like ourselves, of the same DNA, that she was a vegetable. But this “vegetable”, Terry Schiavo, when told that her feeding tube was going to be withdrawn, was able to say, ‘I want’, and ‘I love.’ The tube was withdrawn and she died of thirst. Who is entitled to make the judgment that a person, one of our own species, may be declared a vegetable, written off as a loss, and denied a basic necessity of life - water?

Whose need was being met by that judgment and decision? Clearly, it wasn't hers. Was it the desire, living in a society where everything is disposable, to be rid of someone who was seen as a burden? Was it that she was an offense to our valuation of a person by his/her productivity? Was it that she was seen as an untidy mess, a loose end, to be cleared up definitively? The needs being met by the decision to terminate her life were someone else's, but hers should have had priority. Medicine worthy of the name began when killers and curers parted company, as, for instance, when witchdoctors and healers went separate ways. That separation is now being blurred.

Perhaps the best and most humane response to demands for euthanasia is the hospice movement and palliative care where the terminally ill receive the support of family, friends and community, comprehensive pain relief, and are offered spiritual assistance, so that they may die with dignity.



## THE CATHOLIC CHURCH AND POPULATION CONTROL

In 1968, Pope Paul VI published his encyclical letter *Humanae Vitae* (On Human Life). A key extract reads, ‘Each and every use of the marital act must remain open to the transmission of life.’ (no.11) It stated, ‘the church... teaches as absolutely required that *in any use whatever of marriage* [italics in the original] there must be no impairment of its natural capacity to procreate human life,’ and, ‘Sexual intercourse which is deliberately contraceptive... [is]... intrinsically wrong.’ (no.11) The letter’s comprehensive and uncompromising language presents the teaching in absolutist terms, whether that was intended or not. Based as it was on natural law, that is, on the nature of the human person, not on the Bible or church tradition, it applied to all people, not only Catholics.

The letter offers a holistic view of human sexuality. It integrates its unitive and procreative aspects, presenting it as life-giving and love-giving. It places responsibility for regulation of births equally on men and women. It teaches that people should learn about their body – the part of nature most intimate to them – respect its dynamics and work with those, not seeking to suppress their normal functioning. (This thinking is similar to that in Japanese culture; see above.) It deserves more serious consideration than it received. But many Catholics felt that a mistake was meant in presenting it, not as the best but as the only moral option. They say it makes the (common Catholic) mistake of starting with an ideal that is good, making an absolute of it, and then going on to state that to do otherwise is sinful.

To point out the limitations of *Humanae Vitae* is not to say that everyone else has got it right in sexual matters, with rising levels of abortion despite the availability of contraception, with sexually transmitted infections, extra-marital pregnancies and marital breakdown giving realistic grounds for concern. Alan Guttmacher of the International Planned Parenthood Federation acknowledged that ready availability of contraception did not reduce, but rather increased, the use of abortion: people who neglect to use a contraceptive in situations where they do not want to have a child come to see abortion as the obvious backup.

But imagine for a moment what might have happened if the world had followed the church’s teaching. Family size would have continued at pre-contraception levels, where five to ten children per family was normal. The pope was aware of the population explosion: he wrote of it in his first encyclical letter in 1964 as a ‘serious and pressing problem affecting humanity.’ (*Ecclesiam Suam*, no.15) What would the state of the world be today if family size had continued at that level? It can hardly be an exaggeration to say that human society might have collapsed, socially, politically, economically and environmentally, the latter because of the unsustainability of such demand on resources.

But, of course, that did not happen. The teaching was ignored, and by Catholics almost as much as others. It has not been taught by bishops or priests for decades, and most Catholics are unaware of the letter or of its content. Overwhelmingly, those Catholics who are aware of it, ignore it. The church, while continuing to insist that *Humanae Vitae* remains its official teaching - despite the fact that it has not been received by the church (1) - seems to be relying on collective amnesia to let it fade from memory. Significantly, between the end of the Second Vatican Council in 1965 and 2015, about 100,000 priests left active ministry, the great majority of them marrying and having the standard two children, like everyone else. Did they follow *Humanae Vitae*? It doesn't look like it. Did they believe in it in the first place? Maybe the church is hoping that, in the Western world, declining population may bring a reaction against contraception and then the church may feel entitled to say, 'We told you so.'

There is another consideration. On a world-wide basis, the Catholic church was, until recently, among the largest, if not actually *the* largest, provider of medical services. Its refusal to provide contraceptive services, or condoms to HIV positive persons, meant that very large numbers of people in Third World countries did not have access to them at all. Whether anyone wants to admit it or not, this caused hardship, poverty, and loss of life to parents and children. But, in recent times, in Catholic countries, governments have faced down church opposition and legislated for the supply of contraceptive services.

### Reference

1. 'Criticisms of papal pronouncements will be possible and even necessary, to the extent that they lack support in scripture and the creed, that is, in the faith of the whole Church. When neither the consensus of the whole Church is had, nor clear evidence from the sources is available, an ultimate decision is not possible. Were one formally to take place, the conditions for such an act would be lacking, and hence the question would have to be raised concerning its legitimacy.' (Joseph Ratzinger, *Das neue Volk Gottes: Entwürfe zur Ekklesiologie*, Düsseldorf, Patmos-Verlag, 1969, p.144, translated and cited by Francis A. Sullivan, *Creative Fidelity: Weighing and Interpreting Documents of the Magisterium*, Gill & Macmillan, Dublin, 1996, p.89)

## POPULATION CONTROL

### *Migration and its consequences*

As a matter of interest, population control has an ancient pedigree: -

Then a new king, who knew nothing of Joseph came to power in Egypt.

He said to his subjects, "Look how numerous and powerful the Israelite people are growing, more so than we ourselves!

Come, let us deal shrewdly with them to stop their increase; otherwise, in time of war they too may join our enemies to fight against us, and so leave our country."

Accordingly, taskmasters were set over the Israelites to oppress them with forced labour. Thus they had to build for Pharaoh the supply cities of Pithom and Raamses.

Yet the more they were oppressed, the more they multiplied and spread. The Egyptians, then, dreaded the Israelites

and reduced them to cruel slavery,

making life bitter for them with hard work in mortar and brick and all kinds of field work - the whole cruel fate of slaves.

The king of Egypt told the Hebrew midwives, one of whom was called Shiphrah and the other Puah.

When you act as midwives for the Hebrew women and see them giving birth, if it is a boy, kill him; but if it is a girl, she may live."

The midwives, however, feared God; they did not do as the king of Egypt had ordered them, but let the boys live.

So the king summoned the midwives and asked them, "Why have you acted thus, allowing the boys to live?"

The midwives answered Pharaoh, "The Hebrew women are not like the Egyptian women. They are robust and give birth before the midwife arrives."

Therefore God dealt well with the midwives. The people, too, increased and grew strong. And because the midwives feared God, he built up families for them.

Pharaoh then commanded all his subjects, "Throw into the river every boy that is born to the Hebrews, but you may let all the girls live." (That comes from the biblical book of Exodus, 1.18-22, describing events from about the 13<sup>th</sup> century BCE.)

Economic migration is not new: in the Bible, Jacob sent his sons to Egypt for food (Genesis 42.1-7), and the invasions of the Roman Empire by barbarians from the north-east of Europe may have been driven by population pressures from tribes east of the Urals. In recent years, the movement of large numbers of migrants across the Mediterranean at great personal risk and loss of life is part of a similar process.

### *Resources*

It's not just about numbers: it's also about distribution of resources. History shows that people have always competed for them and fought over them, whether at local level over access to water, grazing, or a mine, or, at the larger level over the basics: materials, markets, money and men. What was the first Gulf War of 1993 about? It was said to have been to restore democracy to Kuwait - which had not been democratic to begin with. A GI, interviewed during the war, put it simply: 'Anyone who can't see that this war is about oil is

an idiot.’ Having taken Kuwait, Saddam Hussein was in a position to threaten Saudi Arabia, and that would have given him huge leverage over Western economies. And the West was not prepared to accept that: we wanted central heating in winter and fuel for our cars at affordable prices. And the almost unknown war between 1998 and 2003 in the Democratic Republic of Congo, with intermittent fighting until 2008, cost 5.4 million dead, the largest loss of life in any conflict since World War II. It was about access to the DRC’s immense mineral wealth. The presidents of both Zimbabwe and Namibia sent regiments of their armies there to secure mines for their personal enrichment.

The future will likely be the same, but on a larger scale. If the ecosystem collapses, how will we respond? If past performance is an indicator, the likely outcome is that the powerful – individuals or states – will grab for themselves the best of what is left and let others go to the wall.

*Birth rates are falling, but....*

The average number of children per woman world-wide dropped from 4.2 in 1985 to 2.9 in 1996. Such a fall was brought about largely by the use of contraception, sterilization and abortion. World-wide use of contraception has gone from 10% in 1968 to 57% at present. And health care has improved with mother-and-child schemes, under-5 programmes and expanded immunization. It is not that people in the Third World are “breeding like rabbits” (to quote an ugly phrase), but that they have stopped “dying like flies”, to quote another. The graph of population growth has become noticeably less steep in the last twenty years, may flatten in about another thirty, and after that, who knows?

About 98% of world population growth is in developing countries. It grows by 160 people per minute, or the equivalent of Germany (80 million) each year; and they all need resources. They also bring resources, each of them having head, hands and heart. But the world has limited resources and we have been over-using them to such an extent that we have been steadily eating into the ecological capital, to coin a term. Several developing countries, notably China and India, with close to one-third of the world’s population between them, are working towards achieving standards of living on a par with those in the West. It would be nothing other than hypocritical of the West to tell them not to do so, since we are clearly committed to maintaining and enhancing living standards for ourselves. But ‘It is estimated that to support our present Earth population at the level enjoyed in North America would require two or three planets.’ (James Hansen, *Storms of my Grandchildren: The Truth about the coming Climate Catastrophe and our last Chance to save Humanity*, Bloomsbury, London, 2009, p.114) But we have only one, and we are messing it up big time.

### *Flawed thinking*

Our thinking processes are fundamentally flawed: -

- we think locally, not globally – all politics are local;
- we think I, not we;
- we think short-term, not long-term;
- we are creatures of habit, refusing to move beyond our comfort zones;
- we are slow to learn from experience. For example, historians tell us that, since the Industrial Revolution, nearly all wars have been lost by the country that started them, and yet, between 1945 and 2000, according to the UN, mankind has fought 250 wars;
- difficult changes we make only when forced to, either by law or by circumstance, and then usually at the last minute;
- we blot out unpleasant realities with blind eyes and deaf ears;
- we combine arrogance and ignorance on a grand scale;
- we allow greed to blind us to our foolishness.

Ireland – by no means uniquely – offers examples of the above: -

- We had a particular problem with litter; we were a nation of litterers. There were campaigns to motivate us to be otherwise, such as Tidy Towns' competitions, clean-up campaigns and programmes in schools to raise children's awareness. They had some positive impact, but the problem remained. Then the government introduced a tax on plastic bags given free with shop purchases. These blocked drains, festooned hedges along road- and river-sides, and clogged drainpipes. The tax started at about 19 cents and grew from there. Almost overnight, people stopped dropping the bags from their hands on a whim, and, after about three months, it was hard to see one anywhere. Despite complaining, people were pleased with the visual improvement.
- Irish people smoked heavily - three times as much as Norwegians - and continued despite many health warnings. In the year 2000, for example, sixteen Irish people died every day of smoking-related illnesses. Then, in the face of considerable public opposition, the government, in 2004, introduced a ban on smoking in enclosed work places, making Ireland the first country in the world to do so. Somewhat to our own surprise, we complied with the law. The effect was wonderful: hotels, bars, restaurants, offices and factories became cleaner and clearer. Workers in the hospitality industry especially were very pleased with the outcome, and benefits to people's health became apparent before long.
- From the mid-1990's until 2008, Irish people enjoyed the greatest period of prosperity in our history. In the later years of that period, personal credit card debt multiplied by a factor of six. People borrowed money for

second and third holidays, and bought second houses everywhere so that Croatians, for example, complained that they could not afford to buy a house in Dubrovnik because the Irish had priced them out of the market. A shop assistant commented that Christmas shoppers did not even ask the price of what they wanted, but were proud to say, 'Put it on my credit card.' The representative of a financial institution said simply, 'The country is awash with money.' Despite warnings from the Irish and European central banks that the economy was over-dependent on construction and that property prices were greatly over-valued, financial institutions continued to borrow and lend money recklessly, irresponsibly and negligently, as two official enquiries reported. In April 2005, the *New York Times* described Ireland as 'the Wild West of European finance.' We were delighted by it; we thought it meant we were in the big league. Our bubble was oiled by a self-promoted "light-touch" regulatory system. We ignored those voices that told us our big spending was based on low-interest loans which ultimately came through the European Central Bank from careful German savers. The state spent lavishly, silencing critics and special interest groups, by, in effect, stuffing their mouths with cash. It financed this through taxes raised on property deals. Then, in 2008, came the crash. Faced with the prospect of Irish banks collapsing like dominoes, and setting off a wider crash in the European Union, the government accepted a bailout from what came to be called *The Troika*, that is, the European Union, the European Central Bank and the International Monetary Fund. Under its terms, the Irish people were made liable for the banks' gambling debts, and even *unsecured* bond-holders were to be reimbursed in full. The cost was an average cut of 20% in people's incomes, unemployment rising to 15%, and emigration, a longstanding safety valve for social unrest, climbed to the sky, while the government borrowed €55 million a day just to keep the country running. The national debt is 2.75 times the size of the annual tax take, and we continue to borrow annually to sustain current expenditure, such as salaries for state employees. Putting it another way, every man, woman and child in the state owes €43,000 of national debt.

In the above, Irish men and women, paradoxically for a people proud to consider themselves rebels against authority, rejected self-discipline but accepted imposed discipline and applauded the outcome. We are not alone in such attitudes.

- An example of unreal thinking concerns the funding of public water supplies. Populist politicians are happy to accommodate those who want water to cost them nothing, with someone else paying the bills. One argument is that water is a right and so should be free. The water supply

system was run by local authorities whose funding was provided by central government, an earlier government having abolished rates (local taxes) to (successfully) buy votes in an election campaign. The disconnection from political and economic reality – whether real or postured – is happily seized on by populists as a vote-catcher, and it is proving to be a winner for them. In the time-honoured tradition of political evasion, the matter was shunted off to a commission, which decided that water should not be paid for according to usage, but funded by central government taxation. It means our use of water is likely to continue unchecked at its present *per capita* level of six times that of Belgium.

- Since a new government came to office in 2010, there has been much talk about “recovery” - the word has become a mantra. It seems to be an attempt to recover the good old days of the Celtic Tiger, with clear signs that the lessons of the crash are already being ignored, denied or forgotten. And there is no discussion of whether such a recovery is environmentally sustainable.

People’s attitudes and practices can change, and, in some respects, have: drink-driving, smoking, and re-cycling are examples. But the pace of change is too slow, and, in any event, many issues are seen as non-negotiable. People in Westernized parts of the world have come to expect constantly increasing living standards as an entitlement. That is unsustainable.

### *Attitudes to crises*

Attitudes to crises, whether economic or environmental, evoke responses which closely parallel those described by Helen Kübler-Ross in her 1969 book, *On Death and Dying*. She wrote that people, faced with the reality of terminal illness, commonly go through stages, as follows: -

- *Denial*: they cannot accept that they are dying, so they go from one doctor to another, and try every treatment they read about on Dr. Google, etc. There has been an abundance of denial about the major issues in and around the population question: numbers, sharing of resources, global warming, etc. Denial of global warming continues in the United States in the administration of Donald J. Trump, even to dismissing it as a hoax.
- *Anger*: people ask ‘Why me?’ They complain that life is unfair - it is - or look for someone to blame. On population growth, it was not uncommon to hear people say that it was all media hype and that the real problem was inequitable distribution of resources; that was a half-truth used to

obscure another half-truth. Robert Johnson wrote well, 'It is not generally the solution that is difficult; it is that our resistance is strong.'

- *Bargaining*: the dying patient asks, 'If I give up smoking, will my lungs get better?' In environmental matters, we have used half-measures as bargaining chips: 'Reduce, re-use, re-cycle' is good as far as it goes, but it doesn't go far enough, and may create the false impression that it is sufficient to deal with the problems.
- *Depression*: terminal patients sometimes become hopeless and give up, literally turning their face to the wall and dying. On a global scale, people may adopt the attitude that we may as well eat, drink and be merry, for tomorrow we die. Speaking in the late Eighties, a former British minister for agriculture, and later the environment, John Gummer, said, 'We can live like kings for the next fifty years and then the roof falls in.'
- *Acceptance*: in many cases, patients make their peace with reality, accepting their impending death with dignity, and say farewell to their family and friends with grace. It is too early to say, but maybe we may be able to do the same in regard to the future of humanity on planet Earth.



## NUCLEAR POWER

The nuclear power industry is its own worst enemy. Its well-established reputation for incompetence, and especially for lying, has destroyed its credibility. It has become routine and predictable that public relations spokespersons for the industry will admit the truth about incidents only when it can no longer be plausibly denied. The situation recalls the comment made by Poles of Communist-era officials: 'It is not so much that they lie, as that they do not know the difference between truth and falsehood.' Consider some examples, bearing in mind the likelihood that many others are unknown to the public: -

### *Windscale/Sellafield*

In 1957, a fire broke out at Windscale nuclear weapons facility in Cumbria, England. On the International Nuclear Event Scale the fire ranked in severity at level 5 out of a possible 7. It burned for three days, releasing radioactive contamination across the UK and Europe. The facility came close to meltdown, but no one was evacuated from the surrounding area. The scientific periodical, *The New Scientist*, commented that, 'Public confidence has been severely shaken by what appear to be attempts to minimise the gravity of what had taken place at Windscale, and even more by the extremely late hour at which any precautions to safeguard public health were put into effect.' (17 October 1957) A 2010 study of workers directly involved in the clean-up found no significant long-term negative health effects from their involvement. One follow-up measure adopted was that the facility's name was changed to Sellafield.

In 1999, the UK's Nuclear Installations Inspectorate confirmed in a letter to the Japanese Embassy in London that plutonium fuel shipped to Japan from the British Nuclear Fuels (BNFL) Thorpe re-processing plant at Sellafield was "associated with suspect quality control data." Following this, Japan refused to accept any more deliveries of plutonium from there. Pete Roche, Greenpeace UK Nuclear Campaigner, said, 'Over fifty years of nuclear activity at Sellafield has confirmed British Nuclear Fuels as a world leader in nuclear cover-ups. BNFL and TEPCO [Tokyo Electric Power Company] deserve each other.'

If lessons were learned from Windscale/Sellafield, they seem to have been forgotten: in 2016, BBC TV's *Panorama* programme aired a documentary on Sellafield. It showed that, according to US nuclear experts, the facility was operating well below accepted international safety standards. Frequently there was insufficient staff to operate parts of the plant safely. Plutonium and uranium were stored in plastic bottles which were degrading. Facilities for storing nuclear waste were breaking down, with cracks in concrete silos, and these were in danger of leaking material which would catch fire if exposed to the air. Management, though, insisted they had matters in hand.

### *Three Mile Island, 1979*

In 1979, at Three Mile Island, Dauphin County, Pennsylvania, in the United States, there was a partial melt-down in reactor #2 of a nuclear generating station. Like Windscale, it ranked in severity at level 5 out of a possible 7 on the International Nuclear Event Scale. Radioactive gases and iodine were released into the environment.

Large amounts of nuclear reactor coolant escaped because of a mechanical failure in a relief valve which jammed in the open position. An automatic safety system came into operation to cool the reactor, but was over-ridden manually by an inadequately trained operator, who thought there was *too much* coolant in the system. He had failed to notice a red warning light on the control panel in front of him because he had covered it with a postcard received from his girl-friend.

*The New Scientist*, in a statement which echoed its 1957 comments on Windscale/Sellafield, stated, 'Metropolitan Edison [the plant's operators] issued hard-to-believe reassurances that all was well, publicized dubiously low figures for the release of radiation from the plant, and dumped slightly radioactive water into the Susquehanna River without warning anybody.' (5 April 1979)

Although there was no evidence of statistically significant increase in cancer among local residents, the accident gave a large boost to opponents of nuclear power. Lack of trust was a major factor. It was said of public relations officials employed by Metropolitan Edison, that, 'They lie even as they breathe.' Where there is a clash between truthfulness and big money, money usually wins – and then loses. The clean-up operation lasted fourteen years and cost \$1 billion.

### *Chernobyl, 1986*

At Chernobyl, Ukraine, in 1986, nuclear reactor #4 exploded. The unit's 500 tonne concrete cover was blown several hundred metres into the air. Chunks of uranium fuel and graphite emitting a broad range of nuclear contaminants was scattered over a radius of half a kilometre. It was a Level 7 event on the International Nuclear Event Scale. 'As the fire worsened, a much more perilous rain of radioactivity began to fall, devastating an area up to 100 kilometres across.' (*The New Scientist*, 1 May 1986) The people of Chernobyl were exposed to a level of radiation 100 times (some say 300 times) greater than Hiroshima's. Belarus, to the north of the Ukraine, received 70% of the fallout. A quarter of the prime farmland and forest of Belarus will remain contaminated for not less than 1,000 years. Plutonium contamination remains active indefinitely, losing only half its potency in 24,000 years. Two thousand villages in Ukraine and Belarus were evacuated, making 300,000 people environmental refugees in their own countries. New sources of radiation are constantly being found in Belarus.

The world first came to hear of the accident when Sweden reported sudden increases in radioactivity in the air. Two days later, an English-speaking member of the Central Committee of the Communist Party of the Soviet Union was interviewed about the matter on the BBC world service. He angrily denied that anything at all had happened at Chernobyl, insisted that everything was perfectly normal there, and denounced the BBC, which, he said, was always churning out anti-Soviet propaganda, and its reports about Chernobyl were just one more example of it. What can one say, except to recall another Polish saying, 'Nothing is true until it has been officially denied'?

Some parts of the human body are especially vulnerable to nuclear radiation: bone marrow, the mucous linings of the mouth, nose and throat, and especially the stomach and intestinal tract. The skin begins to turn brown, giving the person what came to be called a "nuclear tan." Fire-fighters and all of the technicians in reactor #4 died over the following months as the cells in their bodies turned to mush. Fire-fighters had shown truly heroic bravery in hovering in helicopters directly above the burning reactor in order to drop fire retardants into it.

The WHO reported an increase of 240% in the incidence of thyroid cancer. The death rate in Belarus exceeds the birth rate, which has dropped by half because women are afraid of having deformed babies. Downs Syndrome cases have increased by 150%. Cases of oxygen starvation in the womb have trebled. Of necessity, people still farm their land, growing crops and eating and drinking contaminated food.

A project to build a new shelter to cover reactor #4 cost £1.1 billion, twice the original estimate. Because of political wrangles, work did not begin until 2007 even though the temporary shelter, after twenty-one years of life, was dotted with holes and crumbling. It was not until 2016 that the replacement was completed. The work of removing nuclear fuel from the site is expected to take centuries.

A commission of enquiry found that the senior research scientist at the plant, on his own authority, had conducted an experiment which began by setting aside normal safety controls and protocols. The outcome was described as inevitable; considering what he did, it could not have been otherwise. By way of analogy, his actions were described as like a person who drives a car with no brakes at top speed on the wrong side of a motorway, just to see what happens.

James Hansen says of Chernobyl that, 'the antinuke protestors greatly exaggerated the effect of that accident' (p.268), and James Lovelock appears to confirm his view: 'When considering the consequences of Chernobyl it is useful

to recall that the radiation exposure of all of us who were alive in 1962 from nuclear bomb tests was 100 times greater, and despite this we now live longer than ever.’ (*The Vanishing Face of Gaia: A Final Warning*, Allen Lane, Penguin, London, 2009, p.73) Today, wildlife, both fauna and flora, flourishes in the abandoned areas around Chernobyl.

### *Japan*

In *Japan*, a relatively minor leak of radioactive material at a nuclear power plant in the early 1990’s went unchecked for hours. In those days before mobile phones, safety officials could not be found; it turned out they had taken the afternoon off to play a round of golf. It isn’t only Springfield power station that has a Homer Simpson for its safety officer!

### *TEPCO*

In 1999, the Tokyo Electric Power Company (TEPCO) admitted that, with a view to avoiding bad publicity and the risk of litigation, it had deliberately falsified safety inspections of the company’s reactors in the 1980’s and 1990’s. It acted similarly in relation to the discovery of cracks in the reactor shroud at Kashiwazaki-Kariwa’s reactor #3. TEPCO conceded, ‘We personally hurt the public’s trust in us. We cannot ask for understanding to continue the MOX fuel project.’

### *Fukushima Dai-ichi, 2011*

In 2011, a sea-quake off Japan’s east coast triggered a large *tsunami* which crashed over barriers protecting a cluster of nuclear reactors along the seacoast. The reactors shut down automatically, but the back-up diesel-powered cooling pumps were flooded and could not function. In consequence, three reactors went into meltdown from the heat of the fuel rods. Several large chemical explosions followed in the next four days. The plant’s operators, TEPCO, seemed not to know what to do, and issued bewildering and contradictory statements, causing alarm among the public as far away as Tokyo.

No fatalities followed immediately, though it is speculated that there could be as many as 600 deaths from cancer in the decades to come. The WHO said it did not expect an increase in illness among babies born after the event.

In 2012, a commission of enquiry found that the causes of the accident had been foreseeable, and that TEPCO had failed to undertake adequate risk assessment, prepare for collateral damage, or develop evacuation plans. For its part, TEPCO acknowledged this, stating that it had not done so for fear of inviting lawsuits or anti-nuclear protests. There is an inverted logic at work here: necessary protective measures are not undertaken because to do so might alarm people, but the absence of those measures causes alarm, and, potentially,

deaths. Currently, measures are planned to prevent contamination of groundwater by melted nuclear fuel. It is estimated that complete decommissioning of the plant will take thirty to forty years.

Because more than 80 percent of Japanese said they were anti-nuclear and distrusted official information on radiation, the government closed all the country's nuclear power stations for a time, bringing only a few of them back into use by 2016, even though some electricity shortages resulted from the closures. Immediately after Fukushima, Germany permanently closed eight of its seventeen nuclear power stations, declaring that it would develop alternative energy sources instead. In 2011, the German government announced that it would shut all the country's nuclear power stations by 2022.

The wider public, sadder and wiser after so many denied but later admitted accidents at nuclear power stations, have come to regard PR personnel as professional liars, intellectual prostitutes. We may feel safe with nuclear power only when there is rock-solid security against lying, irresponsibility, stupidity and greed. How likely is that? The stakes are high if things go wrong. And, in the event of major war, what would happen to nuclear generating stations? Would staff remain in place to ensure their safety? Would their fail-safe systems shut them down satisfactorily?

### *Ireland*

In Ireland, in the 1960's, the country's national electricity company, the Electricity Supply Board (ESB) decided to build a nuclear power station. At the time, nuclear power had a positive public image and was seen as the way to go for the future. Driven by public opinion, local authorities around the country competed in pressing their claim to have the station in their county. The ESB finally settled on Carnsore Point in County Wexford as their chosen site for a plant intended to be up and running by 1975. But, in 1969, the "Troubles" in Northern Ireland began, and there was anxiety that paramilitary groups might try to sabotage the work, as they had attempted with a gas pipeline from the Kinsale field off the south coast. So the project was postponed. By the time the Good Friday Agreement of 1998 put such fears to rest, public attitudes had changed, and now no one wants to hear anything about nuclear power. But, in fact, some of Ireland's electricity comes from nuclear power stations in Britain through an inter-connector cable linking the systems in the two islands.

### *China*

Ironically, the nuclear industry has a much better safety record than that of coal mining, which, especially in China, suffers an appalling number of fatalities each year. Fairly typical examples are an estimated 3000 deaths in

2008, and 1049 in 2013. If deaths on those levels took place in nuclear power accidents there would be a massive public outcry.

### *France*

Through all these difficulties, France, for several decades, has generated 80% of its electricity from nuclear power, seemingly without major incident.

### *Is there a viable future for nuclear power?*

*Safety and trust* are the major issues. If the nuclear power industry had adopted the approach taken by the airline industry, admitting mistakes honestly, not taking a punitive approach to failure but instead learning from mistakes, and de-politicizing investigations, it would not now be faced with such unremitting hostility and cynicism from the public, even when it has a genuine case to make. (See Matthew Syed, *Black Box Thinking: The Surprising Truth about Success*, John Murray, 2015) But, for that situation, it has only itself to blame.

*There is a technical case to be made for nuclear power.* It produces no carbon dioxide. But it costs more than coal, gas, or wind, and decommissioning outdated plants is much slower and vastly more expensive than anticipated. In the case of the Sellafield re-processing plant, an estimate of another twenty to thirty years, and tens of billions of pounds are projected.

*Nuclear fusion* sounds like an answer to prayer. A different process from nuclear fission, it has the potential to produce immense quantities of power, leaving no radio-active waste and no plutonium. But, at the present level of research, it consumes more energy than it produces. Some scientists dismiss it as a will o' the wisp. And political rivalry about the location of research facilities stalls development work.

The disposal of *nuclear waste* also remains a large problem, sealed in glass and buried in mines for future generations to deal with. This raises risks of leakage into the water table, and the security of such locations in the event of earthquakes. But Lovelock gives this perspective: 'In 600 years the high-level waste from a nuclear power station is no more radio-active or dangerous than the uranium ore from which it originated.' (*The Vanishing Face of Gaia: A Final Warning*, Allen Lane, Penguin, London, 2009, p.70) The waste that fast breeder reactors leave behind has a short shelf life – about 600 years - relative to other nuclear by-products which have a half-life of some 10,000 years. He continues, 'The nuclear waste is a minor burial problem but the carbon dioxide waste will kill us all if we go on emitting it,' and, 'total emissions from the UK nuclear industry are 500 times less than that of the radon gas we breathe every day of our lives. Radon comes from the rocks and soil and is natural.' (p.70)

Much depends on *the type of reactor* used. Lovelock writes, ‘... another big problem with thermal reactors is that both light-water and heavy-water reactors extract less than 1 per cent of the energy in the nuclear uranium.’ (p.197) And at present rates of consumption, known supplies of uranium will last less than sixty years.

*Fast breeder reactors* are highly efficient, but they produce plutonium from reprocessed spent fuel, with the risk of its being diverted for use in nuclear weapons. If that problem can be safely handled – but see *War by bribery* above – then the picture begins to look better. James Hansen writes, ‘Fast reactors can burn about 99 per cent of the uranium.... [they] Also produce nuclear waste, but in volumes much less than slow (thermal) reactors. More important, the radioactivity becomes inconsequential in a few hundred years, rather than ten thousand years.’ (*Storms of my Grandchildren: The Truth about the coming Climate Catastrophe and our last Chance to save Humanity*, Bloomsbury, London, 2009, p.198) A fast breeder reactor can be fed with waste material from nuclear power plants and the by-products of nuclear weapons that are presently stored away for safety. The US has at present 600,000 tons of such waste, enough to keep fast breeder reactors working for 1,000 years. (*Hansen*, p.199)

But priority should be given to energy efficiency and renewable energies. A country such as Ireland, an island nation facing into the Atlantic Ocean, has great natural advantages for producing both wave and wind power. Despite a West coast that provides many natural opportunities, it has done nothing to develop wave power, seemingly because of government inertia. Unlike Denmark, Ireland produces no wind power on the sea and only a little on land, where nimbyism and painfully slow planning processes stifle possibilities. The state Electricity Supply Board has stated that it takes five times as long for it to build a power-station in Ireland as it does to build a comparable one abroad (and it has long experience in foreign projects), because of endless appeals and counter-appeals during the planning and construction process.

Increasing population combined with expectations of increasing standards of living have brought about constantly increasing temperatures, with serious negative consequences that interact on each other and feed into each other. In these matters, we humans act as if we had plenty of time in which to make up our minds. But we don’t, and the facts of physics don’t change while we dither.

## **SURVIVAL**

Survival is the number one issue on the human agenda, maybe the only one that matters. And we don't have forever to sort it out. In the lifetime of planet Earth, innumerable life forms have come into existence, adapted, flourished and then died. From dinosaurs to dodos, they came and they went. Bill Bryson says, '99.99 per cent of all species that have ever lived are no longer with us.' (*Op. cit.*, p.415) Is there any realistic basis for assuming that humans are exempt from the same process?

It seems that non-human life forms became extinct when they were no longer able to adapt to changing circumstances. With human beings, it is not entirely the same. Some circumstances are beyond our control: the activity of the sun, the tilt of the earth on its axis, volcanoes, earthquakes and Earth being struck by asteroids. Some of the latter have brought about near extinctions several times in Earth's history. (See the Timeline) But other changes of circumstance are brought about by our actions. Here is what Richard Rohr has to say: -

Wouldn't it be our last and greatest humiliation if we one day realized that all other creatures have obeyed their destiny unblinkingly and with trustful surrender. It is only humans who have resisted "the one great act of giving birth" and in fact have frequently chosen death for themselves and for many others.' ("Creation as the Body of God," *Radical Grace*, April-June 2010, vol.23, no.2, p.22)

Nature can get along fine without us, but we cannot do without it. In the long run it will likely heal itself of our blunders, but what is in doubt is whether we will be around to be part of that.

There are many and varied, even contradictory, uncertainties: -

- a new Ice Age is overdue by about 2,000 years;
- the sun is now in a "cool" phase; what if it returns to normal?
- the Earth might recover from our actions if there were much fewer of us and of animals, but recovery would be slow and different;
- the planet will likely survive either a new Ice Age or climate change due to global warming, but in different form;
- Earth could survive even nuclear war, but also in different condition.

It seems likely that we humans will drive ourselves to the edge of extinction, perhaps even into it. But life keeps breaking out. To quote Bill Bryson again: 'life wants to be; life doesn't always want to be much; life from time to time goes extinct. To this we may add a fourth: life goes on.' (*Op. cit.*, p.424)

Is there a way of avoiding human extinction? A number of possibilities exist: -



The **first** is to go nuclear, using fast breeder reactors. But a huge change of culture is needed in the nuclear industry, including public ownership.

The **second** is to create safe havens, as suggested by James Lovelock in *The Vanishing Face of Gaia: A Final Warning* (Allen Lane, Penguin, London, 2009) He states hopefully, ‘Emphatically this does not mean there is nothing we can do’ (p.55), but adds, ‘Until we know for certain how to cure global heating, our greatest efforts should go into adaptation, to preparing those parts of the Earth least likely to be affected by adverse climate change as the safe havens for a civilized community.’ (p.44) We can go to cooler, fertile regions and start again in a different lifestyle, a series of ecological Brexits by nations in temperate regions. He says the “safest” places are Ireland, Britain, Alaska, Scandinavia, Northern Europe, Canada and Siberia, Japan, New Zealand, Tasmania, Patagonia and southern Chile. But even that, if it works, will not be a return to the past: ‘Most importantly, we have to stop pretending that there is any possible way back to that lush, comfortable and beautiful Earth we left behind some time in the twentieth century. The further we go along the path of business as usual the more we are lost.’ (p.44)

The **third** is to adopt something along the lines of what Dan Brown describes in his novel *Inferno*. (Bantam Press, London, 2013) In it, he tells the story of a scientist, Dr. Bertrand Zobrist, who, recognizing that over-population was destroying the planet and humanity along with it, and also recognizing that democracies could never take measures that would tackle the problem, because consent would never be forthcoming, went ahead on his own. He introduced into a cistern in Istanbul, (Yerebetan Sarayi - it does exist), an airborne virus which would change human DNA at random so that about one-third of the population would become infertile. It would act without regard to racial, sexual, or other barriers. It would kill no one, make no one ill and would not affect any existing pregnancy. But the resulting infertility would bring population down to levels that the earth could sustain. This vector virus was fast-spreading. Any attempt to undo its work, to reverse its action, could lead to unforeseen and disastrous consequences. He kept it away from government because he believed that government would weaponize any new technology. So he spread the pathogen through the warm, damp atmosphere of the cistern. This was visited by tens of thousands of people a day, mostly tourists, who then took the pathogen home with them all over the world. (A free concert, arranged by him, ensured the place was packed.) To spread the virus all people had to do was inhale and exhale. Zobrist then destroyed the documentation about how he had created it. He believed that humanity had a moral duty to participate in the evolutionary process through genetic engineering.

The technology involved in Zobrist's scheme is away ahead of anything that can actually be done today. It is science fiction – at least for the moment. But much of what was science fiction in the past is science fact in the present. Speaking from the perspective of sixty years' involvement in the protection of the environment, David Attenborough said, 'I have never seen a problem that wouldn't be easier to solve with fewer people, or harder – and ultimately impossible – with more.'