Chapter 10 THE EARTH AND ITS ENVIRONMENT

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10.1 INTRODUCTION

There can be little doubt that there is in the community at least the perception of a crisis in the environment. A range of views are expressed. Some argue that there is no crisis or, at least, that it is limited or manageable. Many would see it merely as a crisis in science or technology. Others emphasise the religious and theological background. Some would offer a primitive spiritualistic, pre-scientific solution. Many Christians seek an understanding based on both biblical and scientific principles. Some of the above views are, of course, not mutually exclusive.

Humans have always altered the environment, but for most of history the effects have been small in scale, diffuse in location and limited in time. Until the 16th/17thC., the greatest effects resulted from agriculture as it developed from merely hunting/gathering to a multi-cultural and later to a mono-cultural industry. The elements of a crisis, such as the pollution of the air and waterways, which first appeared at a few locations in Europe during the Industrial Revolution, still appear in developing countries where industrialisation is taking place.

What then is the nature of the perceived environmental crisis?

To see it as purely a crisis in 'science and technology' is to fail to see the big picture. Moltmann (1985), while acknowledging the pervasive roles of these, calls it a *'crisis of domination based on the striving of human beings for power ...'* and a crisis of the *'whole life system of the modern industrial world'.* This suggests that any study must be set in a wider religious and social context. It is highly significant that modern science, and particularly technology, developed in Europe in the context of a set of underlying Christian values (Hooykaas 1972). It is not surprising therefore that in a course on 'Science and Faith' we should look back and seek to identify the respective roles of science and theology in these developments. We begin (following Russell, 1994) by consideration of alternative world views and changes in attitudes that humans have adopted in relation to the earth, before considering some modern manifestations of the crisis and the theological attitudes towards it.

10.2 WORLD VIEWS IN RELATION TO CREATION

Pre -scientific

The 'pre-scientific' understanding of the world was partly phenomenological (what you see is what is true), partly mythical (a story with 'fantastic' elements to explain the otherwise inexplicable) and partly spiritualistic (of a world ruled by spirits). The ancient Near East and Australian aboriginal creation myths are typical of such pre-scientific views.

Scientific

The modern 'scientific' world view which initially at least was materialistic, reductionistic and rationalistic had its origins in the Enlightenment and Puritanism in the 16th and 17 thC. It was based on success in understanding, predicting and controlling the world. Key ideas were of reproducibility, predictability, verification, proof, falsifiability and laws that provided a universal explanation. The scientific approach treats the world, at least partly, as a 'mechanism' even when biology is being considered (Russell, 1994).

Post-modern

The post-modern understanding of science frequently involves a disdain for rationalism and conventional science because of the (perceived) destruction of the earth in the name of science and technology. Creation and nature are seen rather as organismic, mystical and spiritualistic (Russell, 1994).

Theological

While there may be truth in some of the above, Christian theology looks outside pre-scientific mythology, scientific rationalism and post-modernism for an appropriate understanding of humans in relation to creation. It claims a revelatory basis that involves a 'creator'; the appropriate relationship of humans to the earth is summed up in the word 'stewardship'.

Again some aspects of these may not be mutually exclusive.

10.3 HISTORICAL REVIEW OF THE HUMAN UNDERSTANDING OF THE EARTH

10.3.1 The earth in space

Russell (1994) explains three changes in the human understanding of the earth, viz, its nature, position and status.

Nature — from isolation to integration

Early ideas from ancient Babylonian and Greek myths were of a flat earth, floating on water under an over-arching heaven. However a spherical earth was recognised from the 6thC BC as floating in space (Job 26:7). Greek cosmologists (e.g. Aristotle 384–322 BC) integrated creation into a geocentric system but made a distinction between heaven with circular motion but no change and ether as the only element, and the earth with rectilinear downwards motion, four elements (earth, air, fire and water) in which all was subject to change.

These Aristotelian ideas resisted theological criticism until Copernicus in the 16thC. Changes in the heavens (due to the appearance of super-nova and comets etc.) and on earth (as illustrated by Newton's and chemical laws) suggested that one view of science applied to both earth and heaven; this led in turn to a (romantic) view of the unity of all creation. Scientific advances brought about the integration of the whole universe as the subject of the one set of laws. *'If the earth is "special" in any sense, then we cannot know this from science'* (Russell, 1994).

Position — from fixity to mobility

The ancient idea that the earth was the centre of the universe had a phenomenological basis. Copernicus transformed this understanding of a fixed earth with heavenly bodies rotating about it to a rotating earth hurtling through space around the sun which itself is hurtling through space. This led to a changed view based on new observations of heavenly bodies—planets, super-novae and comets—and the discrediting of old geographic ideas about earth, continents etc.

Augustine (354–430) explained that Scripture accommodated itself to common human understanding and language. Hence there was no necessary connection between 'position' and 'value'; removal of the human home from the centre of the universe did not mean that it was diminished in status.

This change in the understanding of the earth from being the centre of the universe to being a speck of cosmic dust whirling in the immensity of space involved a vast transformation of the then current world view. *'What had altered little was the understanding ... of human and other values that owed nothing to science but much to theology'* (Russell, 1994).

Status—from organism to mechanism

Ancient Near East mythical philosophy saw the heavens as part of God and the earth as divine and organismic, giving birth to everything, including all life. This 'deification' of the earth gave rise to animistic religion. It was generally rejected by the early Church fathers as not in accord with the Old Testament where the

worship of 'the queen of heaven' or of local gods was condemned. God alone must be worshipped; '... *the earth is my footstool* ...' (Isaiah 66:1).

It was also superseded in the West due to the development of reformation theology and the rise of modern science. Yet the idea of the earth and creation as organismic has never been entirely eradicated; the notions of 'mother earth' and 'mother nature' live on in figures of speech, vague notions, superstitions and in 'folk theology'.

CONCLUSION — a mechanistic world view

The above changes and the rise of experimental science in the 16th and 17thC transformed the world view, including nature, from organism to mechanism. The connection between this and the Judaeo-Christian tradition has been discussed elsewhere (Hooykaas 1972). This concept of 'mechanism' as in a clock (logical, determinate, predictable and repeatable) was seen as an expression of the 'laws of nature' which represented the will and providence of God acting in the universe.

This rise of modern science involved the development of concepts based on biblical theology: the removal of myth from nature, recognition of the 'laws of nature', the adoption of the experimental method, doing science for its own sake for the glory of God and controlling/developing the earth for human betterment. The promotion of these scientific concepts arose within various Puritan (Boyle), Calvinistic (Beeckmam) and Catholic (Descartes) traditions. However some, who were major contributors to the mechanistic view (Newton), could never quite bring themselves to believe in pure 'mechanism' at the immediate level.

By the mid 19thC the organismic view was superseded and the mechanistic view was nearly universal. However the latter was both an ally and an enemy of biblical theology. It involved: design which demanded a designer and a mechanical view which became the base for apologetics; a materialistic, reductionist view suggesting that the earth was nothing more than materials, atoms etc; self sufficient deism in which the creator had left the clock after creating/winding it up and a deterministic view in which creation was incapable of accommodating either human free-will or divine providence and a mechanical earth that was seen as expendable/susceptible to abuse.

In biblical terms the mechanical world-view has much to commend it. It includes the idea of design and a designer, an element of determinism and repeatability, the base for the scientific enterprise and technological exploitation but also the ever present danger of damage or misuse. It excludes the organismic view and the pre-scientific myths.

10.3.2 The earth in time.

Again, following Russell (1994), we can consider an historic sequence with a commentary on each from a theological point of view.

A static earth

The pre-scientific view was of a largely static or at least cyclical universe, not only in nature but in human history. There is an element of truth in this at least in the short term scale of human life and experience (Ecclesiastes 1:4-7). But for many, the Bible demanded a linear view of history moving, under God, toward a certain destiny.

An earth in decay

An alternative view is of an earth as the scene of change and subject to corruption and decay (Psalm 102:25–26) compared to the 'unchanging' heavens. This was tied to an apocalyptic understanding of the end of history with the

coming of a new millennium (after Augustine's seven Christian ages). One view (Luther (1483–1564)) was that:

'The whole world degenerates and grows worse each day . . . the last day is already breaking ... the world will perish shortly' (cited in Russell, 1994).

Others, for example, Burnet (1635–1715), Donne (1573–1631), Wesley (1703–1791), etc., saw the mountains, the irregular features and the roughness of the surface of the physical world, as evidence of decay (especially since the flood) because they were not made like that. Hence they were evidence of God's judgment on the earth (Job 14:18).

An earth in equilibrium

The rise of natural theology led to a new understanding of earth, not just as in decay but as evidence of the goodness and benevolence of God. Thus the understanding was of the mountains as providing shelter from the cold winds and their denudation as evidence not only for the decay of the earth but as a natural process providing soil for the fertile flood plains. So the earth as a whole was seen as in a geological cycle, with parts subject to decay while others were subject to growth and rebuilding. The conclusion was that the earth was neither static, nor in decay, but with a long, open ended history.

An earth of great antiquity

There has been a 'young earth' history from earliest times, popularised by Ussher (1581–1656). This involved an active and frequent intervention by God for example, in the flood. By mid 19thC most geologists accepted an active earth and uniformitarianism (constant natural processes) where the time since creation did not limit the period over which the present formation of the earth could have taken place. Many scientists who were Christians distanced themselves from 'young earth' ideas as a result of unsuccessful attempts to produce a detailed correlation between science and Scripture.

Contrast this with the major attack against the old-earth theory that came, not from theological conservatives, but from science itself through Lord Kelvin (1824-1907) and others. This was based on the age of the earth calculated on the basis of the heat loss from it and from the sun (without including the then unknown nuclear processes). All of Kelvin's calculations gave answers that were far too small, although much longer than those for a young earth. However they brought with them the possibility of change in the time scale available for changes in other areas such as biology. He and others helped to establish a science that was not inimical to theistic theology; its study was, as he said, *'the noblest privilege which (the Creator) has granted to our intellectual state'* (cited in Russell, 1994).

10.4 MODERN EXPLANATIONS OF THE EARTH AND ITS ENVIRONMENT

10.4.1 The White thesis

The ignorant or arrogant despoliation of the earth has arisen, it is said (White 1967) by science and technology, which has developed the capacity, and the Christian religion, which gave the mandate (Genesis 1:28) for human mastery over nature and its subjection to suit human desires. However we need to differentiate between what the verse, taken in isolation might be seen to justify, and the general tenor of Scripture. There have been, no doubt, many misunderstandings in the former but there is little biblical evidence, rightly understood and taken as a whole, that would justify a 'dominion' attitude to nature. Christian writers, while acknowledging the superior place of humans in relation to the rest of creation, are also careful to emphasise human responsibility for stewardship under God. As Calvin (1509-64) said: *'Let everyone regard*

himself as the steward of God in all things which he possesses' (cited in Russell, 1994).

Genesis 1 places man as the peak of creation and as steward under God, an idea which is reinforced in other places, e.g. in Genesis 9 and Psalm 8. While humans are created in the image of God, their role is to rule in God's place which includes ideas of care, use and enjoyment.

There is evidence from pre-Christian times and non-Christian areas (e.g. Buddhist) that the idea of human dominion did not arise from Christian understandings alone. Consider Bernal (1967) writing about Marxism: *'It will no longer be a question of adapting man to the world but the world to man'* (cited in Russell, 1994). McPherson (undated) offers an alternative focus for White's invective.

'I think that White aimed at the wrong target. A sturdy belief in unlimited progress has characterised Western thought for centuries. This notion of progress is not distinctively Christian by any means and it is this belief that should have been White's target... The remedy ... is to sever science and technology from their progressivist theology of history in which they had found their home'.

The White thesis will not do.

10.4.2 Post-modern theses

There are alternative, post-modern, post-Christian understandings of these ideas. Post-modernism arose out of a rejection of the ideas of rationality and the development of a more intuitive way of thinking. Its understanding of the created order arises out of its religious roots.

Monism

Monism stresses the unity, interconnectedness and equivalence of all things. In theological terms it erases the God-creation distinction. As applied to the earth it would promote the conservation and preservation of eco-systems on the basis that all things have equal status and the denial of human rights compared to other life forms.

Pantheism

In pantheism all, including creation, is God. In ecological terms it implies that plants, animals and places have spirits which are all part of the 'nature spirit'. Seeing the earth as sacred may lead to opposition to its development for human use since humans have no special rights. White (1967) asserts that by destroying pagan animism, Christianity has made it possible to exploit nature in a mood of indifference to natural objects.

These post-modern understandings have spawned a wave of beliefs under the title 'new age movement'. Many of these echo what Christians have been saying about Western culture but they subordinate rationality to intuition and mystical ways of knowing. This in turn leads to a 're-deification' of nature, a return to pre-scientific notions of an organismic earth, a rejection of modern science and a fuzzy eco-spirituality (Lucas, 1996).

10.4.3 The Gaia hypothesis

A particular form of the post-modern understanding was given expression by Lovelock (1987) in the hypothesis of the earth as a living system entitled 'Gaia' (Greek goddess, mother earth). The name brings with it, from ancient Near East myths, ideas of the earth as one of the 'gods' and as an organismic symbol of fertility. While it may be best described as a conceptual model (Russell 1994), Gaia began as a scientific hypothesis that the earth was a unified but unconscious and purely mechanistic, self-regulating system.

The various responses to Gaia have been partly due to the various ways in which the term has been understood. There is general agreement with the idea of the earth as a self regulating system (based on negative feedback) that is able actively to regulate some aspects of the biosphere, atmosphere, oceans and soil so as to maintain conditions comfortable for life. Whether—as the Gaia hypothesis supposes—the earth is 'alive' depends on what is meant by 'alive'.

While the idea of the earth as 'mother earth' is seen as a reversion to myth, Gaia allowed a religious interpretation which, it could be claimed, was validated by 'science'. However the scientific aspect of Gaia has not been adopted by the New Age movement possibly because of its distaste for science.

10.5 TYPICAL ENVIRONMENTAL PROBLEMS

We consider briefly three areas that may be taken as representative of the problems mentioned above, viz., population, food supply and climate change.

10.5.1 Population

Most would agree that, in any discussion of science-faith issues in relation to the earth and the environment, population is a crucial factor. Beginning with Malthus (1766–1834) many in modern times have warned about the limit that the earth's resources would place on population growth; others have even predicted what that maximum number would be. World population increased only slowly over the previous centuries but is now over six billion and increasing at an annual rate of 1.4%.

The rate of population growth has increased in recent centuries largely due to the reduction in death rate, due in turn to improved sanitation, nutrition and disease control. There has not been a commensurate decrease in the birth rate which only occurs when there is an improvement in the socio-economic status of the population. While this rate of increase has existed before, two additional facts are significant. Firstly this increase is based on a very high existing population and represents a much larger numerical increase than has previously occurred. Secondly some areas are increasing at a much higher rate which is likely to cause severe local problems before community developments cause a decrease in the birth rate and eventually a maximum in the population.

It is logical that greater populations will increase the demand for resources and services. If these are seen as limiting, then the easiest approach to reducing demand is to reduce population growth rate by limiting birth rate although there is no agreement as to how far and how fast this should proceed. From a practical viewpoint, in areas where life expectancy is short, large families are seen as resource for the production of food and an 'insurance policy' against want in old age. It is only when living conditions represented by health and nutrition are improved that security in old age can be assured; the birth rate then falls and population tends to a maximum.

Religious beliefs often promote large families, where a large family is seen as a blessing from God. Limiting birth rate by artificial means including contraception and abortion is therefore seen as contrary to the will of God and has been proscribed in Roman Catholic teaching. This has led to population growth rates in the Latin American countries of some 3%. In other areas family planning and limitation sometimes based on socio-economic pressures have significantly reduced birth rates and projected populations.

10.5.2 Food demand and supply

As a fundamental human need, food, which is the subject of both biblical and scientific concern, is an appropriate subject for consideration in a course on 'Science and Faith'.

Food demand

Food demand is significantly related to population and hence the current, large and rapidly growing population mentioned above causes a commensurate increase in demand for food. At the family level the desire to keep ahead of the personal and community demand for food (by increasing workers) is one of the reasons that family size increases, a process which eventually compounds the problem.

Any increase in socio-economic status of people also brings with it a corresponding demand for improved quality, variety and availability of food and especially increased animal and vegetable protein at the expense of carbohydrate rich foods. There is also demand for increased food security to eliminate the danger of famine resulting from natural or human causes.

Food supply

Food supply is also related to population and the energy resources that power the food production system. This is especially true in developing areas where human energy is often the limiting factor in food production, e g, by limiting the area or the number of crops that can be grown per year.

Food supply, however is also related to the increase in production that is achieved, not only by increased energy inputs in the form of fertilizer and mechanisation etc., but through scientific development and optimization such as plant breeding, pest and disease control and better farm management. There have been enormous increases in food production in recent years and an associated decrease in famine in some countries.

Meeting the need

While on the global scale food supply has generally increased to meet demand, the most significant problem arises when other inputs are limiting, especially at a local level. These include land, water, rainfall, pest and disease control and plant nutrition. The shortage of these as a result of natural calamities (floods, droughts, plagues, earthquakes) and human induced factors such as war, soil degradation and salinity are likely to be critical. Many advances in agriculture for the supply of food have brought with them increases in production but also associated problems.

Pressures on agriculture to produce more or better foods often involve (for example): land clearing and the danger of soil erosion, excessive cultivation leading to soil depletion and erosion, intensification of cropping as mono-cultures which are susceptible to pests and diseases, irrigation which brings the possibility of water logging and salinity, modern crop varieties with the potential for increased production under optimum conditions but also decreased production under non-optimum conditions. In the light of these developments, many farmers (both subsistence and commercial) opt for traditional technologies under a general, if perhaps unconscious but understandable policy of risk avoidance.

New scientific developments in genetic manipulation in plant and animal breeding give promise of increased production through pest and disease resistance, increased growth rates, etc. However these developments often extend the science to unknown and what are seen to be unpredictable areas. Many, in fear of ecological problems, reject or warn against inadequately researched moves into this technology.

The trade in agricultural products is of course one means of satisfying national or local demand. However this can be used to distort the demand and supply of basic food products; e.g, where land is used for the production of export crops (such as to grow animal protein for the rich) in the place of staples (often carbohydrates) for local consumption. On a global scale then the food problem is

not considered to be one of demand and supply but of distribution which in turn is a problem of resource allocation both within and between countries. (See Section 10.7 below).

10.5.3 Climate change

Scientific research shows that there have always been significant changes in the earth's climate. Much of the historical evidence available represents significant natural variation over the long periods of time (millennia). It is only in recent decades that observations have been adequate to measure the trends in climate over shorter periods (decades). These show that the world is in one of its warmest periods in recent climatic history.

The atmosphere contains about 0.03% carbon dioxide and this, together with water vapour, maintains the temperature of the earth at about 15^{o}C due to the so called 'greenhouse' effect. This occurs because the atmosphere is naturally transparent to visible radiation from the sun but is more opaque to the energy that is re-radiated in the infrared range due to the presence of the carbon dioxide and water vapour.

Any increase in carbon dioxide and water vapour, for example as a result of burning fossil fuels, increases this effect and can be expected to increase the temperature of the earth. Whether and how much this will occur is not yet clear but is the subject of much dispute and research (Houghton, 1991). The climate then, which is the long term result of the weather pattern experienced by the earth, is the result of an exceedingly complex set of interacting natural and human factors.

Natural factors

The natural factors include the seasonal and other long term changes in land, vegetation, cloud cover, moisture content, oceans, ice and snow cover as well as the effect of volcanoes, fires etc. At a more fundamental level, the parameters based on these factors combine in a series of positive and negative feedback loops. Such systems frequently become unstable and thereby generate extremes of behaviour. It may be that we are presently in one of these extreme phases.

Human factors

The human factors are likely to have a more long term but perhaps no less significant influence on climate. These result from changes in land use as a result of agriculture, forestry, urbanisation and in the discharge into the atmosphere of pollutants including gases and particulates from burning of fossil fuels and other uses of chemicals. The significant question that arises is, to what extent the current changes in climate that are presently being measured have been caused by human actions or are the result of some significant but as yet unidentified natural changes in the environment?

The influence of climate change (however caused) on local weather is not clear but is likely to be highly variable. Some areas may get hotter/cooler or wetter/dryer or there may be more frequent or greater extremes, e.g. floods and droughts. The rise in sea level is more certain but no less alarming especially for those living particularly on the coastal fringes of the Pacific Islands and the flood plains as in Bangladesh.

One mitigating fact is that changes in climate are likely to be slow in taking effect giving the communities time to prepare appropriate 'defences'. Assuming that the burning of fossil fuels is the primary cause, these problems are clearly global in origin. The responsibility for them is therefore likely to be proportional to the respective contributions to the increase in greenhouse gases from the various countries.

10.6 MODERN UNDERSTANDING OF THE ENVIRONMENTAL CRISIS

In relation to these difficulties, various responses may be identified. For the purposes of discussion we can identify the range by its extremes, viz. 'utilitarian' and 'conservationist'.

10.6.1 Utilitarian

The utilitarian approach takes the big picture, the long term assessment and usually works with large scale averages which blur many serious local and short term problems. It assumes a generally optimistic attitude to technological development and to the solution of any problems that arise. Even where the Christian position is not explicit, the biblical command is adopted (Morgan 1992). *'Be fruitful and multiply and replenish the earth and subdue it.'* (Genesis 1:28) Further, historical experience is extrapolated to allow unrestricted population growth (Beisner 1990).

> '... *if historical trends continue there is no rational basis for believing that population will ever outgrow its ability to provide for itself using the resources it develops ... on the contrary, what we learn from history is that over the long haul and on the average per-capita health, economic well-being and psychological well-being tend to improve faster than population grows... From a Christian perspective of faith in a God of providence, however, we can be confident that human population will never present an insuperable problem.'*

In terms of resources creation is seen as large—for many resources, large beyond our knowing.

> *'Globally there is not the slightest prospect of us running out of any natural resource that we need in the foreseeable future given a modicum of care and common sense.'* (Hore-Lacy 1996)
>
> *'Resources of all sorts will be less scarce in the future than they are today'.* (Beisner 1990)

Further, as Hore-Lacy (1990) claims,

> *' ... human ingenuity quite literally creates resources ...'*

Society achieves this: by substitution of existing resource with new, perhaps sustainable resources (fossil fuel by solar energy); by transformation (of matter into energy in nuclear processes, of previously unusable/uneconomic minerals to economic/useable ones, wood waste to paper, etc.); and by reuse/recycling of old products into new (waste water to irrigation water, waste paper into cardboard). Hence Beisner (1990), writing regarding oil, argues that we will probably never run out because when the resource dwindles sufficiently, its price will rise enough that people will conserve more and substitute other energy sources. Christians who see resources as a God given gift rightly conclude that as such they are meant to be used, where use would include preserve/enjoy; it is in this way that the intent of the giver is honoured (Hore-Lacy 1990).

For the utilitarians and even for Western civilization Morgan (1992) highlights the significance of the utilitarian approach by contrasting it with the environmental movement.

> *'Environmentalism is now the main threat to Western capitalism and as a consequence to Western civilization ... in its pure form it is as radical and uncompromising an attack on the entire structure of Western society as can be imagined.'*

10.6.2 Conservation

Here one focus is put on the finiteness of earth's resources and capacities and on the limit that these will impose, sooner or later, on consumption and pollution. Others in the conservation movement focus on aspects of the environment such as the preservation of what is often called wilderness—natural habitats such as old growth forests, native grasslands, wetlands, rivers etc., in the name of maintaining ecological diversity and other natural resources. Still others emphasise the significance of pollution due to the discharge of wastes into the atmosphere, waterways and the oceans. Various bases are used for a conservation approach. Whether 'God/god' is seen as being involved will usually depend on what beliefs or world view the observer brings to the experience. In one 'secular' approach an appeal is often made to the aesthetic value of natural areas and to feelings of a quasi-religious nature. It is on the basis of this subjective experience that the demand is made to stop further growth and development.

> *'The sooner an ethic based on respect for the natural world can be adopted, the better. Whether such a philosophy is included as part of a religious dogma is seen as immaterial.'* (Ehrlich, et al 1977)

An alternative more pantheistic approach identifies God with the world. According, for example, to McFague (1981), the world is the incarnation of God's very being and presence ... to destroy part of the world is actually to destroy part of the body of God. Expressed in human terms Berry (1987) is blunt.

> *'We are the generation when the day of reckoning has come. In this disintegrating phase of our industrial society we see ourselves not as the splendour of creation but ... the most pernicious mode of earthly being. We are the termination, not the fulfillment of the earth process ... we are the affliction of the world, its demonic presence ... the violation of its most sacred aspects.'* (cited in Collins, 1999)

Without necessarily agreeing with it, Newman (undated) expresses the conservationist point of view at a more practical if extreme level:

> *'… all industry is seen as exploitative, dangerous and polluting ... all in the name of progress but in fact just adding more affluence to those who already have enough'.*

The importance of conservation is expressed by Berry (1987) who writes,

> *'Ecology can rightly be considered the supreme subversive science ... these ecological movements are threatening all those cultural commitments that have brought about the present devastation of the earth. This rising conflict is beginning to dominate every aspect of the human process'.*

10.6.3 A compromise position?

The brief comparison above of the (albeit perhaps) extreme views suggests that the utilitarian and the conservation approaches are in serious disagreement even about the facts, let alone any solutions. One implies that there is no problem, at least that cannot be fixed; the other that a major crisis is looming and urgent action is necessary. Of course no utilitarian would advocate the unbridled use of the earth's resources nor would any conservationist advocate their total conservation. Many would agree with Hore-Lacy (1990) that;

> *'We need to tease out the utilitarian aspect of stewardship without violating the preservation/respect aspect'.*

These ideologically opposed groups appear to express an ambit claim on the truth; no doubt both are partly true. However the two such polarised positions do

not provide a useful basis for a compromise especially if they just snipe at each other across the utilitarian/conservationist divide. Is there a position that takes cognisance of both the economic and the ecological necessities? Many for whom both of the above positions have some appeal suggest that there is. The idea that best embodies this compromise, 'sustainable development', is considered later.

The earth's resources may be represented in terms of the quantities of materials, the number of sites for inspiration, or capacity of the earth to absorb pollutants. How would a limit on these resources manifest itself? Given the large variation in the area distribution and consumption of resources and also in population it would be surprising if there was a short run 'crisis' on a world scale. One would expect a series of local crises, perhaps of increasing severity and frequency related not only to demand but supply, particularly if affected by local war, famine etc.

There would be a slow decline in the standard of living for an increasing number of people punctuated by conflicts over any resources that were limiting. Are we already experiencing such conditions? It is implied in the utilitarian point of view that the earth's resources can legitimately be consumed by those who have them and or know how to utilize them, especially if they are used for an accumulation of community wealth. (J Ralph cited in Hore-Lacy 1990)

But is there a limit to the amount of the earth's total resources that one community can use to satisfy its demand, even if used for the accumulation of wealth for that community? And, we might ask, for which 'community' can they be used—local, state, national, first world, technically developed, white, Western, powerful?

The question therefore resolves itself into one of inter-national or inter-community resource allocation, a subject that receives little attention except perhaps in the context of aid. Before seeking an answer to this dilemma it is useful to consider how resources are currently being allocated.

10.7 RESOURCE ALLOCATION

10.7.1 Human demand

We can, again following Russell (1994), identify the following drivers for the ways in which the earth's resources are allocated and/or misallocated.

Human need

In accord with need, humans have sought to take what is useful from the earth's resources and exploit it for personal and general use. The benefits of such exploitation need no further emphasis. However nothing that is done is without its side effects; every resource is to a greater or lesser degree used up or degraded. A significant amount of damage to the environment arises from this legitimate human activity. For much of history this was of a minor nature, was diffuse and had little long term effect.

Human ignorance

While all such human activity affects the earth, there has usually been the failure (initially at least) of knowledge or will to mitigate the side effects of those activities. Hence while enjoying the benefits of development that society has 'demanded', we have caused damage. This is illustrated by the fact that 'the art' (= the practice, the works) precedes 'the science' (= the understanding, the optimisation) and does not, and perhaps cannot, foresee the problems that will arise. Clearly much new science/technology is introduced without an adequate understanding of its benefits and problems. In other ways the community is 'forced' to exploit processes with an intensity that is damaging; for example, excessive soil cultivation in order to meet the urgent need for food.

Perhaps the adoption of a technology depends on the likely cost and or magnitude of the dis-benefit to the user and to society generally. It is clear that the earth is self cleaning for some, even many pollutants and at some levels of these. However some would say that for certain modern chemicals with a long life (e.g. uranium) and some modern techniques with potentially far reaching and unforeseeable consequences (e.g. genetic manipulation), we need to learn from our past mistakes and move more slowly in the future. It is, of course, not helpful or logical for society to blame 'science' for the dis-benefits while itself enjoying the benefits. Failure in the past is not with science *per se*, but with its human exploiters among whom the scientists may have had a significant role.

Human greed

The application of much science in technological development and the consumption of the earth's resources has been driven (in part at least) by human greed. This can be illustrated from our own experience at a human or corporate level. The destruction of habitat, the taking of productive land, the substitution of staple for export crops, the over exploitation of resources, etc., all illustrate the point. In some countries exploitation for personal/local/tribal use is fostered by local connivance, authoritarian regimes and personal corruption; its benefits are often not shared in a way that could be considered satisfactory from a community point of view.

Human aggression

Again the local despoliation of the earth by conventional war needs no emphasis. Nor does the unimaginable damage of nuclear conflict and the possible nuclear winter over the whole earth.

Human arrogance

Many aspects of the exploitation of science and technology can only be described as arrogant. These arise from a rejection by humans of their role and responsibility for the earth and the community. This is perhaps best illustrated by the exploitation of people in working environments or in the promotion of products that are known to be harmful to health. The early refusal of car manufacturers to acknowledge the benefits of improved crash-worthiness in cars or of cigarette manufacturers to acknowledge the dangers of smoking (even when privately admitting it) are examples of such arrogance and its twin brother greed.

10.7.2 Our common good

All humans enjoy the results of the exploitation of the earth's resources. However the above review suggests that resources for consumption are at times and in some places often badly allocated without any long term community benefit. The benefits of resource allocation are frequently privatised and the real costs and dis-benefits of use are born by the community. Further, the discussion of the use of the earth's resources on the basis of world averages is not helpful and only serves to hide the large disparities between the first and the third worlds. For many in our community this mis-allocation is unacceptable; they seek a compromise to the above two positions and an alternative to what is seen as, if not an unsustainable then an unethical global condition. This will involve not a cessation of development but a reallocation of the earths resources and a more targeted effort to improve the living conditions of the poor.

The conclusion of the above is that the immediate technical crisis is not one of lack of resources *per se* nor of immediate collapse of the earth's ecological or economic systems. Rather it is one of resource allocation on an inter-national as well as an inter-community, inter-sector, inter-gender etc. scale. For the Christian, the earth's resources are a gift and the resource allocation question raises the further question: to whom is the gift given? For whom is it intended?

The undifferentiated statement of 'giftedness' and the command to 'fill the earth and subdue it' are not of themselves a useful basis for addressing the disparities mentioned above. Thus the ethical problem remains and will be considered later.

Can we begin to solve the problem of resource allocation; if so, how? The idea that best embodies this compromise is 'sustainable development' an idea of course that no one would seriously oppose.

10.8 SUSTAINABLE DEVELOPMENT

10.8.1 Technical sustainability

The idea of sustainable development involves consideration of both economic and ecological necessities. These are often seen as in opposition but those who adopt less strident positions find that compromises are possible and that, for example, sustainable resource management has a positive side particularly when the real costs of a project are born by the project and are not transferred to the community. The Bruntland Commission (Anon. 1987) which reported on the environment and development sounded a realistic and hopeful note:

> '*This Commission believes that people can build a future that is more prosperous, more just and more secure. Our report ... is not a prediction of ever increasing environmental decay, poverty and hardship in an ever more polluted world among ever decreasing resources. We see instead the possibility for new economic growth, one that must be based on policies that sustain and expand the environmental resource base. And we believe such growth to be absolutely essential to relieve the poverty that is deepening in much of the developing world'.*

Various approaches may be suggested for promoting sustainable development.

International proposals

The Bruntland report suggests three major principles. The world must move towards sustainable yields from forests, from the soil and from the ocean. The world should grow economically so that the poverty in the third world can be overcome as this is the main reason why the rain forests are being cleared, soils are overgrazed and fisheries depleted and why populations continue to grow. The world must develop industries that use energy, water and materials more efficiently and have the highest environmental standards. Clearly if these principles were applied we would begin to solve what all recognise as a serious social and economic problem.

More specifically, treaties relating to the Law of the Sea, the International Treaty on the Movement of Toxic Wastes and the Montreal Protocol on Ozone Depletion have been adopted and show that multi-national agreements can in principle promote sustainable development. Other conferences on, for example green-house gas emissions, have not reached equitable agreement probably because the participants wish to avoid commitments which they perceive will be detrimental to their long term economic position. Governments are the key element at this level but, since ultimately individuals determine governments, then power rests with them. The question arises, is the community willing to pay the costs of implementing treaties and conservation measures that move in the direction of sustainable development? The community is likely to be equivocal over these matters.

Community work

For many in local communities the way forward is to think globally but to act locally. Most communities can point to local industrial developments that are sensitive to the environment. If we accept the smelting of aluminium using fossil fuel as an energy source, then the Alcoa smelter at Portland Victoria ('The

Smelter in the Park') is an example of such a development. In terms of restoring and protecting the environment, Landcare is an excellent example of a community based rural movement that will provide, perhaps in the medium to long term, a win-win, outcome for both the environment and the economic welfare of the whole community. Again governments and many commercial companies can and do promote this type of development through the provision of 'seed' money and matching grants.

Personal roles

The benefits of a personal commitment to and action promoting sustainable development are many. While the sum of the total savings from action at the 'margins' of one's consumption might initially be small compared to the total costs, such actions provide a psychological commitment to conservation in principle that may lead on to more significant changes. It also provides signals to others in the community and in Government that the community is willing to bear the extra costs and is perhaps willing to move on to a greater commitment to sustainable development.

> *'Hope recognises the reality of our environmental problems and then takes small steps towards solutions. It is not wishful thinking nor is it a desperate leap into the future; it is a quite clear vision that we move towards in small meaningful steps, generally with a group of others.'* (Newman, undated)

10.8.2 The ethical imperative

It has been argued above: that there is a crisis—but not necessarily of resource depletion nor ecological or economic collapse; that it is a problem of global, national and local mis-allocation of resources; that sustainable development at all levels represents a technical, human solution (however poorly defined); that such development will involve both economic and ecological compromises.

If we accept these conclusions, we are left with the problem of finding an ethical imperative to drive the process. But we will not find such an imperative for sustainable development and for the associated national/personal lifestyle compromises within the socio-economic-technical field. They only answer the question of 'how?'

The problem for humans in this, as well as in all other fields, is not one of knowledge but of will (Romans 7:19). We seek an answer to the question 'why?'. For the Christian, the authority of Scripture in relation to stewardship will (ought to) provide the necessary imperative. Others who would not necessarily accept its theological basis, nevertheless argue and work toward a similar end. Having made that claim, we need to recognise the problem of how to interpret these ideas about stewardship and apply them to a modern, scientific, industrial society.

10.9 A THEOLOGY OF STEWARDSHIP

Any theology of stewardship concerns the relationships between God, humans and the earth. Within the Bible, the teaching regarding stewardship comes mainly from three areas: the creation stories, the history of the primitive, pre-scientific, agricultural community of Israel and the teaching in the New Testament.

10.9.1 Creation stories

In the creation stories where the idea of stewardship is implicit, we see that God is the creator and sustainer and therefore owner. Creation is good, purposeful, dependable (Sherlock, 1984). Humans are part of creation (Genesis 1:26, 2:7)) but are given a special role which we might describe as stewardship This is to be

seen: in humans having a role as rulers—having 'dominion' over the created order (Genesis 1: 26–30); in the productive aspects of creation-'a garden to till and to keep ...' (Genesis 2:15); in enjoying the fruits of the creation (Genesis 1:29; 2:16); in bringing some 'scientific' order to the creation by naming the animals (Genesis 2:19–20) but with some limit on what was not allowed (Genesis 2:17).

10.9.2 Israel's history

The ideas of stewardship are further drawn out in the history of Israel in their land and by implication in its resources and production. For Israel, the land is God's (as land owner) but is given to them as to 'strangers and sojourners' i.e. to the landless living within the owner's household (Wright 1997). For Israel it was to be used and enjoyed to the extent of their satisfaction (Deuteronomy 8: 7-10) although it also brought with it temptation to forget God as both the owner and giver (Deuteronomy 8:11-12, Brueggemann 1977). Their continued occupation was contingent on their fulfilling the owner's commands and retaining his confidence (Wright 1997). In particular Israel was also warned against using the land in ways inconsistent with God's will, for example, by exploiting a brother Israelite or the stranger within their gates (Leviticus 25:35–38). Much of the Old Testament is the story of their failure to live in this way.

10.9.3 New Testament teaching

The New Testament teaching on stewardship is quite general and is expressed in many different ways. It is frequently expressed in terms of the Christian's ruling over the world in the name of Christ in a similar way to that of ruling over and managing a household (Douglas *et. al.* 1962). Generally the ideas of stewardship are expressed in terms of love. For example Jesus uses parables as in the Good Samaritan (Luke 10:29–37) and the rich man and Lazarus (Luke 16:19–31) as well as other direct teaching to illustrate and to command the sharing of our goods with our neighbours in need. Paul in collecting aid for the poor in Jerusalem (Romans 15:25), and John in 1 John 3:17, are but two further illustrations of the example and teaching of the New Testament writers that is consistent with the ideas of stewardship.

The question remains how this biblical idea of stewardship might be expressed in our modern, technological, industrial and pre-industrial societies.

10.9.4 Conclusion

The ideas of stewardship are fundamental to the biblical story. The ideas are both explicit and implicit, they are presented with both subtlety and authority and speak to Christian and non Christian alike. They are not negotiable for the Christian as a response both to creation and redemption; they are the epitome of good works and Christian love.

But to know the truth is not enough. The world is often a place where humans fail to live up to what they know. They take authority over creation, where the creature is worshipped and served rather than the creator (Romans 1:25) and where there is a serious mismatch between actual and intended purpose. So the whole earth is tainted by sin and groans in anticipation of its re-birth (Romans 8:22). It is, as Moltmann (1985) writes *"the enslaved creation that hopes for liberty"*.

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