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Philosophical issues in environmental management: nature-culture dialectic and sustainability

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The environment has become one of the major issues of our time. Environmental management has become a discipline with different approaches to protect the environment against the effects of human exploitation. The basis of managerial approaches to environmental issues is to be found in the nature-culture dialectic as expressed in the modern humanistic ideology of mastery in a technical and economic sense. Such a dialectical approach is hierarchical and will prioritise either nature or culture. A non-dialectical approach, such as can be found in Reformational philosophy, gives more possibilities to encompass the future of humankind and nature in one perspective.

Filosofiese kwessies in omgewingsbestuur: natuur-kultuurdialektiek en volhoubaarheid

Die omgewing het 'n belangrike saak van ons tyd geword. Omgewingsbestuur het as dissipline ontstaan met verskillende benaderings om die omgewing te beskerm teen die effekte van menslike oor-eksploitasie. Die basis van bestuursbenaderings tot omgewingsake kan gevind word in die natuur-kultuurdialektiek soos uitgedruk deur die moderne humanistiese ideologie van beheersing in 'n tegniese en ekonomiese sin. So 'n dialektiese benadering is hiërargies en sal natuur of kultuur prioritiseer. 'n Nie-dialektiese benadering, soos wat in die Reformatoriese filosofie gevind kan word, bied meer moontlikhede om die toekoms van die mens en natuur in een perspektief te omvat.

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Environmental management is a new academic discipline on the programme of many tertiary institutions. The sudden proliferation of research and training in sciences directly related to the "environment" indicates both practical concerns and theoretical shifts, and on a deeper level, shifts in the way in which relationships between humankind and the environment are considered. These relationships imply concerns on the level of life view and philosophy.

The sudden appearance of "environmental management" in curricula calls for philosophical investigation and (possible) justification. Environmental management is often qualified with terms such as "sustainable" among others. Such courses tend to appear in the discipline of the natural sciences, and focus on ecological systems and their vulnerabilities. Little argument is needed to justify the inference that the concerns are focused on the natural (subhuman) environment, and the relationship between the activities of humankind within and towards that environment. The claim of human mastery implied in the term "management" calls for philosophical investigation, since the qualification "sustainable" indicates a well-known concern: the "self-sustenance" of the environment and its management may be at risk.

Implicitly a deep tension of modern humanism (probably the characteristic tension) emerges: the nature-culture dialectic. In modernity humankind elevated itself philosophically, by progressive secularisation, to the position of a divinity — "lords and possessors of nature", as Descartes believed humankind could become. In Derrida's terms, the relationship between nature and culture became a hierarchical opposition, with culture as the dominating pole. In Dooyeweerd's terms, one could call it a reductionist "religious ground motive" with the primacy focus on the cultural power or freedom. However, fairly early in modernity, Hobbes pointed out that the human divinity is driven by lust for honour, power and wealth — this would become the driving force of progress according to Quesnay, Turgot, Adam Smith, Kant, Marx and others.[1] Humanism itself — in particular between

1 Cf the studies of Venter about "competition" (Venter 1992 &1996) and "natural law" (Venter 2001 & 2002).

and after two world wars — admitted to the failed sustainable self-transcendence, as well as the failed control of nature, by the human rational being: the works of Sartre and Heidegger give evidence of this.

This study focuses on the basic problem: how the relationship between "nature" and "culture" in the modern understanding of these terms affects the understanding of and the problems faced by environmental management, and how a more sound understanding of these, aided by a wider and less reductionist ontology, can help one overcome some of the difficulties and dilemmas.

Some of the issues exceed the boundary imposed by the limitations of this study. For example, how to estimate the value and role of a specific type of culture, such as agriculture, with regard to the environment. Does cultivation contribute to an increase in the variety of species, or does standardisation for the sake of consumer tastes decrease the variety, and is this detrimental? As far as the data are concerned, the biologists must determine the answers to such question, but there is also a "good-and-bad-for" type of question from an ontological point of view. Why do we want to sustain the environment, or specific species? Is the variety valuable in itself, or does it only have value in relationship to human beings? If it is the latter, do they have only value for use or also, for example, aesthetic value? In this study such detailed questions can only be recognised and answered in principle.[2]

The prominent movements in environmental management can be divided into two categories:

- The first category comprises movements which have an underlying mechanistic worldview with "reason" in the Archimedean position. In terms of the "nature" versus "culture" dialectic, "culture" is absolutised to a hierarchical position above "nature". However, mechanistic thinking tends towards a partialistic analysis (case studies), producing valuable technical research, but the value context and philosophical basis are often not worked out (Venter 1997: 107).

2 Following H G Stoker, Van Hamburg and Simons have answered that "nature" — with all its variety — has a value of its own, since its relationship to the Creator is a direct one, and not exhaustively mediated via the human being (Van Hamburg 1997: 5-6, 24, Simons 2006: 355).

- The second category describes the movements that have a more holistic, organistic worldview, with "nature" in the Archimedean position. This forces the "nature" versus "culture" dialectic in the direction of absolutised "nature" in relation to "culture". Some of these adopt a more "naturalistic" position (conflictual survivalism approaching the mechanistic viewpoint, for example FIGU 2001), but mostly they opt for a romanticised, spiritualised idea of nature, in which little attention is paid to data about local crises. Such approaches are to be found in the popular works of Capra, but also in some forms of ecofeminism (cf Ecofem 2005, Capra 1986 & 1984).

The nature-culture dialectic thus includes another tension: the mechanistic versus the organismic ways of looking at "nature" and even human life. From a history of ideas perspective, such dualisms appear as cultural motives that should be considered over time as part of the intellectual substrate of a culture. With this in mind, the most influential of the oppositions are identified and followed to reveal the underlying philosophical issues.

Our problem statement thus needs some expansion: How does the opposition between the mechanistic worldview and the organismic worldview influence the approaches taken by those aiming at managing the problems of the environment?

Moreover, given that the idea of "sustainable environmental management" is fairly recent, one cannot delve into the deeper philosophical problems stated above, without some preliminary analysis of the basic concepts contained in the idea — of course the terms mentioned directly come to mind. Thus: What is meant by "sustainable", "nature" as "environment", and "management"? And concomitant with these, concepts connected to present-day social life, such as "utility?

The hypothesis of this study is that most current leading forms of environmental management are based on movements which are trapped in the "nature" versus "culture" dialectic and that in some influential cases it takes a capitalist (technicist) form,[3] which ultimately turns into

3 This "good for business" attitude is taken by the US Environmental Protection Agency as the reason why environmental management systems should be

vulgar hedonism — a "Hobbesian" degeneration of both utilitarianism and hedonism. The other more organismic alternative (such as the Green Movement) has, in spite of its activism, not taken the lead as yet; its new Romanticism is impossible in the short to medium term (even the pre-romantic Jean-Jacques Rousseau admitted that a real return to nature is impossible),[4] and it thrives on the same spiritualistic holism which led humanism into the trap of Nazism and Fascism.

Methodologically the study has been helped by Derrida's idea that hierarchical oppositions need to be taken apart, and the hierarchy at least subverted. However, Derrida's method too easily rests within this subversion — in the case of the nature-culture opposition it may lead us into a new romantic return to nature (the new agers are already suggesting this). A modal analysis, such as that offered by the Dutch Reformational tradition (Dooyeweerd, Vollenhoven, and so on) — derived by and large from Husserl's anti-reductionist attitude — breaks the opposition down to a large variety of aspects (rather than opposing "parts") shared by all of reality, and therefore provides a different, but non-reductionist "valuation" of both "nature" and "culture". Dooyeweerd's form of transcendental critique gives helpful indications on how to find the deeper dialectical tensions, drilling through the foundational terms of a specific field. It is part and parcel of this tradition not to outrightly reject what others have done, but rather to restructure it into a theoretical approach in which the contradictory effects of reductionism are neutralised. These methodological indications have been used flexibly and in no case slavishly.

developed (cf EPA 2005). It causes a tendency to reduce nature in an economistic way to economic abstractions such as "natural capital stock" (cf Asafu-Adjaye *et al* 2004). Although such attempts should not be rejected entirely, it should be considered whether exploitation is not simply given another form.

4 Cf the Addendum to Rousseau's *Discourse on the origin of inequality*: "As for men like me, whose passions have destroyed their original simplicity, […] who are persuaded that the Divine Being has called all mankind to be partakers of the happiness of celestial intelligences, […] they will respect the sacred bonds of their respective communities, […] they will scrupulously obey the laws, and all those who make and administer them […]" (Rousseau 1916b: 228-9).

Given the neglect of the more basic issues in the dominating approaches to the practice of environmental management, its research basis, and even the teaching of programmes at university level, it is useful to focus on the above questions, following the methodological pointers and the hypothesis as an Areadnean thread.

For the sake of readability and the easy flow of analysis and exposition, the problems are not tackled in the order mentioned above. They are interwoven in such a way that the transcendental approach starts from the basic concepts of the discipline and moves to the more foundational philosophical and life view issues and tensions (the intellectual substrate of our culture). Thus the first sections of the analysis will focus on "sustainability", "environmental management", utilitarianism and hedonism, the extremist fanciful flights from the problems, followed by the polarising effects at the interface of "culture", science, and economism, "nature" versus "environment". Against this background, a brief set of indications is extracted from the reformational tradition to indicate a non-dialectical approach to environmental issues, and how this can complement present positive tendencies from other sources.

1. The epistemological boundaries of defining "sustainability"

The concept of "sustainability" is very difficult to define. It appears to be internally incoherent because one perceives it to contain two contradictory presuppositions. The first is an almost Parmenidian idea that "everything remains the same". Therefore, "sustainability" could be taken to mean that change must occur very conservatively, or not at all. But, at the same time, human beings are being bombarded with evidence of vast changes occurring in nature. This may include direct epistemological evidence (changes in the earth's crust) or interpretations derived from direct evidence (evolution of biological species). These observations of change may lead to the second presupposition, Heraclitean in nature — that nothing in nature is "sustainable" or unchanging. "Sustainability" could be regarded as dependent upon human intervention and as something unnatural or cultural.

Forming a coherent conceptualisation of "sustainability" necessitates a synthesis whereby some kind of "acceptable" change is accommodated in the idea, within the parameters of conserving integrity. In other words, at least in the idea, some balance has to be found between what is left untouched and what is changed, in such a way that the discontinuity does not destruct the continuity as an identifiable outcome linked to the situation prior to the most recent changes.

For human beings, it is assumed that this integrity ranges from physiological tolerance levels that make life possible to quality of life that makes life meaningful. A pervading Western view seems to hold that "nature" must be conserved in such a condition that minimum human ecological survival is possible, but at the same time that "culture" should be developing to make increasing "quality of life" a possibility. An example would be the Vienna Convention for the Protection of the Ozone Layer, under the auspices of UNEP, which binds its signatories

> to take appropriate measures to protect *human health* and the environment against adverse effects resulting from human activities which modify or are likely to modify the ozone layer … (UNEP Ozone Secretariat 2005, my italics, AL).

Since production of "culture" usually necessitates the use, exploitation, and domination of "natural" resources, a "nature" versus "culture" dialectic has developed in the West (as will be shown below). Making either "nature" or "culture" subservient does not restore sustainability. Sustainability implies that "nature" and "culture" co-exist in such harmony that the "cultural" changes of "nature" do not totally break down continuation of the "natural" processes which presently seem to hold all of reality "together". "Quality of life" can only ensue when "natural" and "cultural" needs are met simultaneously since, even in the modern reductionist meaning of "nature" (as reduced to the subhuman environment), "nature" still provides the substrate on which "culture" is built.

The above circumscription of "sustainability" is the product of stumbling over abstractions such as "continuity", "discontinuity", "identity", "reality", "nature', and culture". Some of these will be discussed later in this article; others are taken intuitively on face value. However, the "general opinion" of a generation is often reflected in

the popular art of that generation. In the case of the Western "nature" versus "culture" dialectic, popular science fiction offers a vehicle for some interesting (and perhaps prophetic) insights — also of the issue of sustainability Although they are not products of academic intellectual analysis, these insights often point to issues that are recognised by the public intellectuals outside the academe itself.

A newspaper review of Michael Crichton's new science fiction novel, *State of fear*, emphasises a serious epistemological issue regarding the concept of "sustainability" (Mitchell 2005). The issue concerns the scope and limits of the scientific window that forms our view of reality:

- On the one hand, environmentalist groups, which consider the scope of our ability to know grand enough to allow the formation of legitimate knowledge, believe that our current trends in development are unsustainable, and will invariably lead to an uninhabitable earth.
- On the other hand, more skeptical groups state that the scope of our scientific window is simply too limited to accurately witness the large-scale homeostatic changes in nature that occur over vast time scales. According to them, we are constructing predictive tangents on the statistical graphs of current ecological trends and then use these tangents to extrapolate much too far into the future. The fact is that our limited window in time is blinding us to the large-scale feedback loop mechanisms that may be present, rendering our predictions somewhat off target. The implication is that our normative cultural responsibility is much larger and more complex than anticipated.

The present authors hesitantly approach the skeptical groupings in the sense that, as Bergson indicated a century ago, science tends to linearly extrapolate beyond the limits of observation, while we do not have good reasons to assume that "nature" will in the long run continue along the lines observed within our records. We do not have a physical Archimedean point of observation beyond our own space time limits. Similar arguments have been voiced by Thomas Kuhn about Galilei's use of the telescope, while Feyerabend (1975: 99-108) even accuses Galilei of being a "chancer".

However, given the environmental problems already occurring, one cannot simply reject the warnings of the first group. Epistemological claims are often influenced by considerations other than seeking the truth: thus those that have an interest in promoting nuclear energy may support the arguments of those who claim that the use of fossil fuels will inevitably lead to an unacceptable level of global warming, adding that nuclear energy is much safer and more "manageable". While the claims of those who fear global warming by fossil fuels may be overstated in terms of the window of observation and the records available to science, and the claims of the others tainted by economic considerations, one will also be suffering from similar overstatements if one simply refuses to heed warnings since there is no "proof".

Presently, one of the most dominating ideas is that managerial strategies can cope with the problems of the environment, and make it "sustainable". The increasing appearance of "environmental management" in tertiary curricula accounts for the importance of "management" as a solution to many problems — also of the environment.

2. Sustainability in the context of environmental management

The problems relating to the concept of "sustainability" are acutely evident in the context of "sustainable environmental management".[5] Standard manuals of "management science" tend to define "management" in terms of having authority, giving leadership (through policy-making), directing staff to the aims of the organisation, and exerting control over processes leading to such aims (Stoner 1982: 8, 302-24, 467-91, 98-127, 590-608). The Dutch and Afrikaans term "bestuur" literally means to be in the driving seat of a car and have the controls of the vehicle in hand.

5 The concept of "sustainability" is presently expanded to cover the areas of "social development" and "economic development", and rightly so, in the sense that these types of development are important factors necessitating the "management" of the "environment".

A few aspects of management are of primary importance: steering, control, reaching aims, using persons as means. These aspects presuppose certain conditions: visible pathways, stable lines along which to move, techniques of steering and control, persons willing to accept such controls or techniques available in order to enforce direction and control. When it comes to managing with regard to the natural environment, the following conditions will have to obtain: a certain predictability of the behaviour of both "nature" and "humankind", as well as the techniques to control any unacceptable deviations from the direction chosen.

"Nature"[6] is a complex, homeostatic system. When the "natural" equilibrium is disturbed, nature retaliates through feedback loops until a new stable state is reached. This new state may not be comfortable from a human perspective, although still perfectly "natural".

"Equilibrium" usually suggests a mechanistic, physicalistic worldview. A more biological conceptualisation like "homeostasis" would perhaps be more suited to my intent. It would provide a more organismic (holistic) view according to which "all of nature" is regarded

6 For the moment, we are using the concept of "nature" in accordance with our conditioned intuition. But, because this conceptualisation is reductionistic, we shall expand on it later.
The *Penguin Dictionary of Philosophy* (Mautner 1996: 372) explains that "natural" and related words, especially "nature" can be used in a variety of senses: "Hume, when discussing in Treatise of human nature whether virtue and vice are natural, notes that, depending on the sense of the word, the natural can be contrasted with what is miraculous, unusual or artificial. Elsewhere in the same work he contrasts it with civil (originating in social and political institutions or conventions), mental (in our mind, in contrast to physical nature outside ourselves), supernatural, and so on. Another contrast is that between nature and culture. In the Aristotelian tradition, the nature of a thing is internal to it, its essence, but also accounts for its characteristic functioning or development. The contrast with "civil" is the one which, since the eighteenth century, indicates the reduced idea of "nature" as the "sub-rational". It can perhaps be argued that this intuitive reduction of the concept of "nature" has led to the belief in the scientific and technocratic control of nature. From Descartes to Skinner, this reduction has caused our ideas of the value of nature to be predominately concerned with instrumentality. And because we regarded nature in this way, it became possible for scientists and technocrats to "control" nature (and therefore also ourselves).

as being "homeostatic". "Homeostasis" refers to a range of possible changes in the region of an entropic balance that allows an organism to maintain itself at a level above the entropic balance (death) (cf Ho & Ulanowicz 2005: 42, 45-6). Above this looms the question discussed above: whether the scope of our scientific window of reality is large enough to sustain such a claim in a scientifically safe manner.

For practical purposes, we shall initially have to use the organismic view that extrapolates aspects of individual organisms to nature as a whole, and that is more sensitive to the biomass of the whole world than the reductionist, partialistic, mechanistic view that has been leading the pace since Descartes. The more holistic, organismic view may offer positive insights for the biological sciences, as long as its limitations as a metaphorical worldview are recognised, and it is not, without question, converted into a totalitarian world view (cf Mussolini 1938: 18; also Venter 2002: 352-4).

"Environmental management" is humankind's attempt to control and/or direct the behaviour of homo sapiens so that the natural homeostasis is not disturbed to such an extent that "nature" becomes uninhabitable by people. It is grounded on the basic principle of "greatest happiness for the greatest number" (Wilkinson 1980: 214). "Happiness" in this instance is defined as "utility" and the "greatest number" refers to "biggest population". Thus "sustainable environmental management" is about directing people, and keeping them under control, for the sake of their own happiness, or "utility". The choice has thus been made to direct the behaviour of human beings in such a way that the use of the environment can be continued, and this is qualified — a use which will guarantee, or at least be a substrate for "happiness".

The debate about happiness dates back to the turmoil of the Hellenistic era, when philosophers attempted to define the "good life" or the "happy life". There were those who chose an intellectual, dignified, stiff-upper-lip sense of duty (the Stoics), striving for an Aristotelian *eudaimonia* (almost mystical intellectual enjoyment), and those who believed in enjoying the material and emotional pleasures of life but then defining *hêdonê* as the avoidance of pain and fear by living a solitary and sober life. Modernity, with its ideas of human

mastery and use would change the meaning of the good life, and even shrink the earlier ideas of utility.

- The degeneration of "utility"

In *Principles of political economy* (1848), J S Mill reflects on the difference between what economics measure and what human beings really value. He believed that human beings should sacrifice economic growth for the sake of the environment. In *Utilitarianism* (1861) he proposed that happiness should be assessed not merely by quantity, but also by quality (Mautner 1996: 352-5).[7]

This means that utilitarianism traditionally (as refined by Mill, in particular) did not imply that only materialistic values were worth pursuing. It is only recently (under the influence of nineteenth-century economic theory) that the utilitarian principle in the context of environmental management was taken to mean "greatest financial gain" (Wilkinson 1980: 211-5).

Furthermore, it has recently (in the nineteenth century) become "rational" to work for maximum personal advantage, while self-centeredness forms the basis of all sensible social behaviour. An example of this is the idea that individual financial advantage is automatically transmuted to advantage for everyone in the form of job creation. In practical economic behaviour, "a man is considered rational when: (a) he pursues ends that are mutually coherent, and (b) he employs means that are appropriate to the ends pursued" (Godelier 1972: 12). According to Lange, rationality really occurs only in the capitalist entrepreneurial system of production (Godelier 1972: 17).

Gainful activity in monetary relations became an activity based on bookkeeping calculations and thus a rational activity. This can be concretised into the idea that rationality is simply working for maximum gain with minimum input.

7 At this stage the tension between the modern city environment and the rural lifestyle was being pushed to extremes by the belief in progress. This is evident in the works of Smith, Kant, Marx, the Romantics, and follows through to the neo-romantic New Age.

The advent of "rational economic man" therefore changed a "necessary evil" into a "rational good". For even though brutal self-centredness was by and large considered the driving force for human behaviour since Hobbes, and somewhat later also the motor of progress, such self-centredness was considered to be irrational, animalistic, and a necessary but passing phase in the development of humankind. Turgot, Adam Smith, and Kant viewed self-centred competitive and conflictual behaviour as an instinctual, necessary passing phase on the way to a rational, peaceful situation.

Human traditions determine human value judgements. Under capitalism, positive capital return automatically indicates social desirability (Goudzwaard *et al* 1994: 49). The utility goes toward material needs and comforts, a tradition established in the wake of Descartes.[8] Competitiveness, rather than the striving for peace, becomes the norm for a rational society — a World Competitiveness Index, the ten commandments for praise and blame. If a person or nation struggles against the global economic power concentrations, then the fault is simple to determine: a lack of competitiveness on the part of the "loser". Mill's belief in a qualitative utility, and Kant's constitution "For the sake of an eternal peace" have gone up in the altar smoke of Mammon and Dionysius.

- Endless "wants"; endless "needs"

In *Discours de la méthode* (Chapter VI, 1637) Descartes (1969) declares that it is acceptable for us to use nature to our own advantage:

> Through this, if we know the power and the behaviour of fire, water, air the stars, the heavens, and of the other bodies which surround us, in the same distinctive way that we know the different crafts of our master craftsmen, we could use them in the same way for all purposes for which they are fit, and in this way make us masters and possessors of nature. It is not only to invent an unlimited number of techniques,

8 The control process proposed by Descartes (1969, *Discours de la méthode*, Chapter VI, 1637) is natural scientific and technological. He wants to deduce the "power" and "behaviour" of "nature", desiring strict, quantitative laws, which can be used to invent techniques for control. And the control aims at utility. No longer the Augustinian tension of horizontal action (man needs bread) versus vertical meditation (man shall not live by bread alone). And no more Bacon's primary focus on suffering, but rather a self-centred vision of overcoming.

> by which we can, without exertion, use the fruits of the earth and all the possible comforts in it, but also and especially for the sake of the preservation of health, which is undoubtedly the first among good things and the foundation of all other good things. For even the mind is strongly dependent upon the organs of the body [...]"

It is worth noting that Descartes' differentiation between "nature" and "mind" already portends a reduced, exploitable "nature" with the aid of human technology.[9] Venter's studies of the idea of "nature" in modernity shows that the stoic and medieval idea of "nature" — which then included all of creation, also reason — was reduced by modern rationalism to the sub-rational. In Descartes' case the "mechanical", Leibniz added the "biotic", Locke the "psychical", Hume the "sentimental" — all these belong to the sub-rational. The "rational" took the place of the medieval "supernatural" — however now not as a *donum superadditum* from God, but as emerging from the "natural" (cf Venter 2002: 24-6). Thus the "nature"-"reason" dialectic precedes and gives birth to the "nature"-"culture" dialectic. Competitive exploitation is thus initially "natural" and later "rational". A significant case in point is Quesnay, the leader of the eighteenth-century physiocratic school in economics (free marketeers *par excellence*), according to whom "natural law" is the exploitable regularities of the physical, and morality is the good use of such regularities (cf Venter 2002: 5).

Thus, according to this utilitarian principle, "nature" is considered exploitable — it is in fact moral and rational to exploit it for the sake of human "happiness". "Utility" initially referred to the satisfaction of needs but the face of "needs" can change. In a materialistic, capitalistic context, "needs" and "wants" may become confused. A drug addict confuses a "want" with a "need" when a chemical that initially provides recreation becomes medication, after physiological tolerance develops. In the case of obesity, a "need" (enough food for biological survival) is confused with a "want" (more food than necessary). Because "wants" are infinite, it follows that the "needs" of an egocentric advantage seeker will also never be satisfied (Wilkinson 1980: 55). In

9 Technology as means of exploitation will be discussed below.

the context of a severely urbanised, technological consumer society, former "wants" simply become "needs". The vegetable garden somewhere in the backyard or on the roof of an old urban house has been replaced by the supermarket and the fridge. This becomes evident when those technological creations which we assume as needed/necessary suddenly collapse and we find that we can in fact get along well without it. The present electricity power crisis in South Africa points to many of these assumed needs: hotels, conference centres, class and seminar rooms in universities have recently been constructed without windows and with airtight doors, thus air conditioners are "needed". In fact, many of these rooms are useless without air conditioners. However, given the fairly mild climate in most of South Africa, windows fronting in the right direction combined with the right kind of isolation would have made the air conditioners unnecessary. At root lies the striving for more, the newest, the technological, while that which is directly and naturally at hand, and will have no detrimental effect on the environment at all, is ignored and even wasted.

As early as the eighteenth century Adam Smith theorised about "needs" and the apparent impossibility of keeping them within boundaries. He classified them as follows: "Every man is rich or poor according to the degree in which he can afford to enjoy the necessities, conveniences and amusements of life" (Smith 1950: 32).

Smith does not clearly distinguish between "needs" and "wants". He works in terms of the necessity of material progress as a basis for social progress — the title of his famous book, *An enquiry into the nature and causes of the wealth of the nations*, which expresses the success of the national state as a political entity, and the striving to give this a base through the creation of national wealth.

Of course, the poor are dependent on the rich to spend on the "amusement" side to enable them to have work and access the "necessities". Overproduction, on all three levels, leads to overexploitation in the name of "needs" (which are in fact the mistaken "wants" of an insatiable society). Thus, although he distinguishes between "necessities", "comforts" and "amusements", the wants ("comforts" and "amusements") are in fact as "necessary" and needful as the needs. The system cannot flourish without the cycle of money flowing upstream

from the necessities to the amusements and downwards to the necessities again. This cycle was later described as the cycle of money and goods, and has its origin in physiocracy, where Quesnay developed an economic "nature"-"culture" cycle with agriculture as the motor of the economy. It has been noted above that in Quesnay this cycle is an exploitative interaction between physical nature and moral freedom.

The idea of a natural base — material and instinctive — which supports and guides a rational, cultural superstructure was articulated more clearly in the capitalist theory of Turgot (cf Venter 2002: 28-31), and was given a complete formulation in the dialectical materialism of Karl Marx. It became part and parcel of modern Western thinking, as is clear from the elaborate and expanded version in the psychology of Maslow (1971: 128, 141-6). Thus in Western thought a hierarchy of needs was established over centuries, always starting from the "material" or "natural" side: "necessities" (understood as food, clothing and lodging), "conveniences", and "amusements", to be realised in that order.

In connection with this Veblen has theorised that the "leisure class" had in fact turned into its opposite and that Marx had to be wrong, since everybody would like to become part of the "leisure class"— that spent their time amusing themselves — and therefore no worker will support a revolution in favour of communism (cf Heilbroner 1955: 171-202). This theory seems to hold in the US because the workers were effective enough in negotiations to become rich and to remain conservative. In the rest of the world the learned (supposed "leisure makers") are workaholics and those in desperate need of work have all the "leisure".

Under the influence of a society directed at "comforts", "amusements" and "leisure" as quasi-needs, the face of "utility" and "happiness" shrunk to indicate wanted "needs" in a popularly hedonistic sense — to ensure the "greatest pleasure for the greatest amount of people". This pleasure structure demands all the resources and in fact makes other forms of happiness such as dignity, love, and so on difficult or even impossible.

The critical change in the concept of utility was made by the influential nineteenth-century economist Edgeworth. Under the influence of Bentham's moral hedonism — in particular, the calculus of pleasures

and pains — Hobbes's idea of the war of all against all for power, honour and glory, the Darwinian idea of progressive natural selection, and possibly also Freud's theory of the instincts (the Id) in Edgeworth's "utility" was transformed into a popular or even vulgar hedonism.[10] The original hedonism of the Epicureans, according to which a happy life was based on a sober and unengaged lifestyle, is substituted by Edgeworth with the idea that a life of power, leisure, and wealth is the ultimate form of utility, happiness and enjoyment. This contrasts sharply even with the modern concept of utility proposed by Mill.

Such conceptual changes both express a new public attitude and, as theoretical doctrine, also present this attitude as "natural" or "rational" or at least "normal". Hannah Arendt (1958: 4) points to some self-defeating consequences of the freedom to "leisure": Automation and technical progress will eventually free us from labour, but this becomes problematic in a society in which labour has earlier theoretically been glorified:

> It is a society of laborers which is about to be liberated from the fetters of labor, and this society does no longer know of those higher and more meaningful activities for the sake of which this freedom would deserve to be won. Within this society, which is egalitarian because this is labor's way of making men live together, there is no class left, no aristocracy of either a political or spiritual nature from which a restoration of the other capacities of man could start anew. Even presidents, kings and prime ministers think of their offices in terms of a job necessary for the life of society, and among the intellectuals, only solitary individuals are left who consider what they are doing in terms of work and not in terms of making a living. What we are confronted with is the prospect of a society of laborers without labor, that is, without the only activity left to them. Surely, nothing could be worse (Arendt 1958: 5).

Arendt, still too much of a Humanist, miscalculated in one sense: poverty has not disappeared, and the need to work for a living has increased as the population increases and the cities become swollen with people. But the types of work available have been changed by technology, so that technologically unskilled labour finds it difficult

10 "Vulgar hedonism" in this instance is used after the analogy of Marxism's "vulgar materialism".

to make a living. The technological society with its large enterprises is consuming the material infrastructure from underneath the worker in leisure.

The consequence is that a society focused on entertainment and indulgence for the human being, concomitant with a conceptualisation of "nature" limited to the sub-rational, will always prioritise the "wants" of the human being and only in afterthought consider the rest of creation's "needs". This must inevitably have a negative effect on the homeostatic balance in "nature". An example of this is our vast expenditure of energy (fossil fuel, uranium, and so on) for human comfort. The fact that we interfere with the homeostatic balance is dangerous since we do not know exactly what is happening on macro level and what our influence on the balance is. The organismic thinkers in the Green Movement, among them the system's theorist Laszlo (2004: 45-55), still think that we are able to understand "the mind of the Universe" by means of some "theory of everything". Even if such theories could gain academic credibility, the question remains whether they can contribute to saving the environment without moving to totalitarian control by the few.

However, our lack of an Archimedean point for understanding and control in the modern sense should not deter us from reading the signs of the times with humility. The fact that radioactive materials take a long time to break down and that people (who were supposedly in control) have made big mistakes in the past, as well as the fact that radioactive material can be obtained on the black market, should warn us that we have the ability to disturb the local homeostasis on such a long-term basis, that life becomes unsustainable even if the equilibrium will eventually be restored. But this will imply that we think normatively and relinquish the unsustainable position of autonomous humankind, whether of a rationalist (such as Kant and Hegel) or an irrationalist (such as Nietzsche, Sartre, and Laszlo) kind. Believing in a human, autonomous divinity, Western culture, as the dominating culture of the globe, has lost its humility with regard to all norms: caring for the soil, the plants, the animals, and fellow human beings. All these have lost every value except their use value for profit and enjoyment.

- Pragmatism and the emergence of "cultural" necessity

In Western thought the belief in progress which originated in the eighteenth century Enlightenment has died out in many intellectual contexts, but has survived in the form of pragmatism.

Pragmatism is fixed on the pursuit of practical success or advantage. Practical success in the twenty-first century is measured in economic terms. This means that the faith in progress has been rewritten slightly into the belief that economic growth must be unending and limitless. "Success" equals "competitive advantage" in economic terms. Even the "sacred halls" of academe and the churches have not escaped the model of success and power: the "chief executive officer" or the "managing director" — giving direction, controlling, managing by "scientific" and technical means. Pragmatism is success-directed, but then "success" means to achieve one's goals and in postmodern terms there are no norms to distinguish between "good" and "bad" goals; nor are there norms for means. In fact, in postmodern terms, there may not even be "ends" (still too normative?) — there are only means. Emotional or financial blackmail of staff by management to maximise management's "ends" may thus become acceptable. The underlying social "means-end", financial gain, has for example become normative in the world's universities: a major standard of academic quality is the amounts in scholarships, sponsorships, contractual income, and patent income generated by academics. Self-advertising works better than sophisticated intellectual work. The philosopher Baudrillard states that advertising and the media are omnipresent, even in the most holy places, such as heroes' acres (cf Baudrillard 1985: 129).

In a normless hedonistic society, a means — money — has become an end, a final standard of measurement. We can call this an economistic society.[11] This is echoed by Maurice Strong, secretary-general of UNED and Canada's representative on the Brundtland Commission: "Our commitment to continuous growth in gross national product is built right into the economic system by which modern industrialised societies function. It is based on the assumption that

11 An extensive and careful analysis of "economism" can be found in Simons 2007: 172.

more is better, that the well-being of the societies can only be assured by continuous growth in the material sense …" (Goudzwaard & De Lange 1994: 107). This suggests that our cultural system has forced itself into a channel, too narrow to turn back, and whose end is surely not to be reached for a long time to come.

This plunges us into a prisoner's dilemma.[12] Although individuals might want to change the present economic practice, it would be discouraging to adhere to self-imposed economic restraints for the sake of sustainability while others receive all the advantage by refusing to do the same (Goudzwaard & De Lange 1994: 92). Simons argues that the World Trade Organisation's actions and rules result in the prisoner's dilemma being solved in favour of the richer countries and to the serious detriment of the poorer countries. Simons focuses on issues regarding agriculture, economics, and the environment, and his analysis thus gives reason for serious concern: the exploitative plundering of the environment in poorer countries both for local survival and for utility in the richer countries is thus promoted by an organisation founded for mutual protection.

The implication is that the balance between economy, ecology and socio-cultural development will be hierarchical, favouring the economy and to a certain extent socio-cultural development (of a specific kind),[13] rather than ecology.

Examples of this can be noted in developing Third-World countries such as South Africa. In these countries, developing industries principally answer to two gods. The god of economic viability must

12 "In the philosophical problem of the prisoner's dilemma, each of two prisoners must weigh these choices: if one confesses and implicates the other, who remains silent, the first goes free and the second gets a long prison sentence; if both confess and implicate each other, both get moderate sentences; if both remain silent, both get light sentences on another charge. It is to each prisoner's advantage to talk, but it is to their collective advantage to stay silent, and therein lies the dilemma" (Goudzwaard & De Lange 1994: 92).

13 One has to query the proportional spending of a world society on poverty relief, intellectual development, peace, creation of meaningful work, recovery of damaged environments, protection of healthy lifestyles which are millennia old, *vis-à-vis* entertainment, sports, war … But in the West conflict and competition has for so long been projected as creative forces.

be satisfied before the god of environmental legislation can be placated. Most companies need to be ISO 9001/14001 accredited in order to be competitive in the market, as a result of governmental and public pressure. Emerging firms that do not comply with the accreditation standards will, however, not fail accreditation as long as they can prove that they have a long-term environmental management plan that will reduce emission levels and other environmental damage in the future. The reasoning behind this is that strict enforcement of environmental legislation will cause struggling and developing companies to become insolvent; this is unacceptable. The environment can thus wait a few years until the company has sufficient economic resources to tend to that cause.

The fact that economic needs are given higher priority over environmental needs is further justified by the erroneous assumption that we must produce more technology to help save the environment. Powerful technological advances are only attainable through economic means. The importance of technology is seated in its facilitation of human ability to control natural necessity. The concept of "necessity" has thus shifted from its basis in the natural laws to a new form of cultural necessity — the ability to control nature by means of technology and the economical means to attain this control. Simons (2007: 334) calls this repeated loop feeding back into production and technological development with its speeding-up effect, the treadmill effect. Once on the treadmill, the treaders have to keep up with its increasing speed because it is too dangerous to get off. It is self-created "determinism".

Cultural necessity or determinism does not imply that culture, and thus behaviour towards nature, cannot be changed. Cultural issues such as language change all the time, but the basic need to communicate is a necessity. In the present case, the system has come to depend on certain factors, both ideologically and practically. It is a global Hobbesian situation: either win or die. And to win, you have to exploit those against whom you want to win. Where wants are not only perceived as needs, but have been made into system-supporting necessities, such wants are no more measured against norms — they have become laws unto themselves. However, as was argued above

with regard to the electricity crisis in South Africa, where human beings in humility use that which is given and near at hand in a normatively responsible way, it remains possible to slow down the treadmill and eventually stop it if necessary.

Furthermore, care should be taken not to fall into a rigid nature versus freedom dichotomy which, concomitant with a reductionist view of nature and an overestimation of human reason, may lead to ecologically unsound behaviour towards nature. In fact, both "rationality" as well as "natural law" (in the reductionist sense) have been used to both absolutise human freedom (into complete mastery over nature) and deny it.[14] "Nature" was supposed to deliver us from all guilt and responsibility, just to deliver us to the elitist natural scientists (in all the different branches of later positivism). The deeper dilemma is the failure of the project of modernity to produce a rational society with peace, freedom and prosperity (Habermas). Is this society recoverable or shall we inevitably return to the Hobbesian state of nature? How can a human being be a divinity who carries all the world on his/her shoulders (Descartes's hope), and yet remain a human-all-too-human, this worldly being who has no guide and norms and is guilty of failing to be "god" simply because s/he is human (Sartre)? And yet even Sartre (1949) talks as if we are the creators of the world.

Should we not, in humility, seek the real place of humankind in the world, and the norms valid to regain our living space as something given to us and not created by us?

3. Polarising effects: the balance between ecology, economy and social development

It is clear from the above that tensions and polarities recur in all the relationships that are of concern for both "culture" and "nature", and especially regarding the control and use of resources called "natural".

14 Cf for example Kant's views on the deterministic aggregate of human social choice (Kant 1991: 24).

Capitalism and the importance of material wealth have encouraged human beings to waste natural resources. Subsequently it has become apparent that natural resources are very limited.[15] The evidence is becoming rapidly stronger that the self-proclaimed masters of the planet have created scarcity to the point of extinction. This has caused management to impose itself as a saviour (Achterhuijs 1988: 21).

Over centuries natural science and, in particular, mathematical formulas have become valued as the only true representation of reality — not only with regard to subhuman "nature", but also with regard to socio-economic realities. This ability to transform the physical elements of reality into quantifiable relations gives rise to a generalised and abstract perspective on reality (cf for example Godelier above). Thus "reality" is reduced to "resources", "production factors", "utilities", "poverty", and so on. The coherent universe as a life-supporting environment itself becomes a scarce object to be "managed".

Although an all encompassing, holistic view may provide an Archimedean point, though totally beyond mortal reach, Western intellectualism has, throughout history, repeatedly accepted that it is in possession of just such an elevated position. For the Rationalists, the Archimedean point was Reason (cf Dooyeweerd 1953, 1: 12-3). This explains why Kant found himself in a tension. First, on the one hand, he believed that all human beings were morally autonomous and thus chose their own moral laws while, on the on the other hand, he had difficulty with the fact that human beings were "immature" and did not use their reason — given that progress to rationality did not occur at an equal pace for every individual. Secondly, he believed that the accumulation of choices determines the life of the individual

15 Rapa Nui (Easter Island) serves as an example of a man-induced ecodisaster. Social competition on the island was a major causative factor in the destruction of the indigenous palm forests, resulting in the collapse of the human population. On several other, similar South Pacific islands, an almost converse situation prevailed. On these islands the human beings were more thoughtful and environmental impacts, though vast, were sustainable. If Easter Island can be considered a model for earth as a whole, the history of the island should be taken as a contemporary warning (Rainbird 2002).

as a natural law. Of course, Kant regarded himself as being in the Archimedean point and thus pretended to have a complete overview of history, which other human beings lacked. This kind of elitism is clearly present in his later essays in which he reduces ontology to the history of human progress. With the rise of behaviourism, the techniques of science became the accepted Archimedean point — yet another illusion (Kant 1991: 23-36, Skinner 1982:11).

This points to at least three polarities:

- Instinctiveness and brutishness within the reign of enlightened reason.
- The unequal speed of enlightenment for individuals, thus the principal equality of all rational beings, in conflict with the elitist idea that some become rational earlier than others.
- The determinism created by the aggregation of individual, autonomous choices.

It is noteworthy that at this stage of modernity "culture" and "civility" were closely associated with "rationality", while "nature" was associated with individuality, instinctiveness, and short-term instinctuality. The three polarities thus express this deeper dialectic. However, the terms "nature", "culture", "reason", "civility" shifted within the reductionist boundaries. The reason for the gamut of opinions is that modernity's scientists[16] function under the ether of an epistemological pretension — that "reason" provides a fixed, objective and autonomous ontological ground. Even though they have been working under the pretence of the presence of a generalised abstraction called "reason", individual thinkers often generalised solipsistic opinions.[17]

16 The history of ideas did not start in modernity. The rise of rationalism can be traced back to the time of Galilei. Irrationalism appeared from the middle of the nineteenth century while rationalism was still in motion. A form of fragmented irrationalism — known as postmodernism — has emerged from the twentieth century.

17 Venter (2006: 280-2) distinguishes nine different meanings of "reason". One could therefore say that "rationality" indicates a contextual logic and that, depending on the context of the author (being a philosopher, economist, natural scientist, moralist, practical technician), the understanding of "rational" may differ.

With the decline of rationalism, different options remained: heroic vitalism (Nietzsche) provided one option; simple choice for freedom's sake (Sartre) was another. One could still count on practical cultural approaches for the sake of advantage (such as provided by pragmatism), as well as the control of the natural scientist for the sake of a better life, as proposed by for example behaviourism. In some cases (different positivisms) the consciousness that science itself is a cultural practice seems absent (as if "nature" produces natural science) and in all of them a kind of intellectual elitism seems hidden.

The problem is that there are as many scientific opinions as there are scientists. Irrationalist scientists, whether naturalistic or spiritualistic, do not subscribe to "reason" as the point of departure, but are nevertheless under the same humanistic pretension: the idea that humankind has some tower from which it can see the past and the future — all of reality and all of history. Nietzsche's myth of eternal recurrence; Mussolini's idea of the state as the organic, mystical reality that gives the individual its real life; Capra's organismic view of the coming era of Aquarius, and Laszlo's view of the Akashic field, are all cases in point.

The pretence inherent in such self-transcending immanentist-oriented philosophies is quite problematic — even dangerous, as indicated above. In the first place, "reason" or "being-human" is supposed to provide mortal scientists with nothing less than a complete overview of the universe — past, present and future (cf Dooyeweerd 1953, 1: 12-3). This is the case not only in the philosophies of Kant, Comte, Marx or Skinner but also in Einstein, Bohr, Darwin, Dawson, Hawking, with tendencies to "theories of everything".

- From this grand perspective the useful regularities of nature are supposed to be clearly accessible — even Comte regarded the "laws of nature" as subjective constructs about regularity aimed at human utility and control (cf Comte 1957: 174, Venter 2002: 36).
- Secondly, as a result of this, complete human control of nature has for a long time been supposed to be possible. Humankind would sway the forces of nature to anthropocentric advantage (Heidegger 1938: 85-8). Even though this supposition is no longer

popular in philosophical circles, the basis of the present-day urban, technological societal system still functions on the foundation of this presupposition.

The assumption inherent in this epistemological pretension is that "reason" earlier, and these days the "human being" or "a scientist", has sufficient ontological distance from nature in order to produce a grand overview of nature in its totality.[18] This assumption is flawed. Human knowledge and technique can never be autonomous, because it resides in living, limited, subjects — human beings.

Human beings are ontologically part of nature. We have physical bodies and material needs. Again the "nature" versus "culture" tension becomes apparent: where the human being pretends to be at a distance above the rest of the world, for modern rationalism, "reason" is both "supernatural" and "natural", because humanist thought wanted to emphasise the uniqueness of the rational human as "master" of "nature" while still maintaining "nature" as the *archê*.[19] As modernity proceeded, "nature" — as the subrational and original part of the human being — became more important, but even then, intuition, life force, science, and technology continued to provide a humanist Archimedean point.

Note the problem of the dialectic: on the one hand, the human being is "natural" — a product of "nature" — and, on the other, he is supernatural — a divinity above and alienated from "nature" — even the enemy of "nature". Can this dialectic be dissolved? To remain inside the dialectic would mean that some of us will prefer the

18 It is difficult to realise how a "scientist" can also be an "irrationalist". Yet this is not only possible, but factually true. "Rationalistic science" assumed fixed principles and a fixed logic for the construction of theories. Irrationalism has degrees: one could accept, as twentieth-century deductivism, that the points of departure (for example mathematical axioms) are arbitrarily chosen. Russell & Whitehead (1970: vi) and Einstein (1921: 2, 5) pretend this. One could also represent the experiential side of scientific work as trial and error, afterwards constructed as a deductive theory (Einsteinian pragmatist operationalism).

19 At times, in the contemporary scene, the tension leads to total fragmentation: on the one hand, one finds the strong naturalism of Dawkins and global competitiveness and, on the other, the pantheist-spiritualism of some New Age thinkers.

naturalistic attitude (expressed so acutely in the novel and film, *A Clockwork Orange*), where we have to allow "nature" in all its brutality to control our lives; on the other hand, some would opt for a cultural hegemony, with its own mystical oppression, whether statist, technological, economic or cosmic in kind.

4. Humankind and "nature"

During the pre-modern era in the West, human beings were considered part of nature and therefore positioned somewhere inside nature. This is clear from, for example, Thomas Aquinas' views on "nature". For Thomas, the human being as Aristotle viewed it, is the summit of "nature" — this includes its rational capacities, which for Thomas is the normative end of the natural being. In Thomas's view, there is something incomplete about the human being — something to be added by God — the supernatural mystical end of intuiting God Himself. This he calls the "supernatural" (cf Thomas Aquinas, *Summa Theologica*, Quaestio II, Articulus III).

Since Descartes, this perspective has changed and human beings have been regarded as both part of a reduced, mechanistic conceptualisation of "nature" and simultaneously rationally elevated above "nature". As a consequence, human beings become the "masters and possessors" of "nature" and from the heights of that throne, humankind came into conflict with its own natural origin: Hobbes (1946: 63) shockingly pointed out that the masses do not live according to the precepts of Cartesian reason, but rather according to their own brutish instincts. It is only in a few quiet moments that reason reminds one of justice. Thus humankind needs a master, called the state, or "public reason", to keep its instincts in check. These sentiments were echoed in the rationalist thinking of Turgot, Adam Smith, and Kant — all of whom are in search of some form of containment of the selfish instincts until one day all of us will have progressed to the position of peaceful rationality.

Thus the exploitation of nature resulted from the elevation of the "rational" human being into a supranatural, egocentric position, while reducing nature to the "sub-rational". The inadequacy of "reason"

as Archimedean point was indicated in the previous section, where initially the dialectical tensions of modernity were discussed.

Furthermore, in the representation of some thinkers, such as Hannah Arendt (1958: 1-3), the nature versus freedom dichotomy indicates that human beings produce culture as a revolt against the binding force of natural (mechanical) laws. Arendt's views probably reflect the modern immanence standpoint, according to which the human being emerges from nature but culturally transcends itself in overcoming nature.

But, if this culture also becomes as necessarily binding as the natural laws, the dichotomy only shifts towards culture versus freedom, and nothing, in terms of freedom, is gained. Although human beings have presented themselves as the "measure" of all things, they have instead become enslaved by the cultural ideologies of their own creation. In recent times, there has been a string of them: communism, capitalism, to name but two. In the time of Jean-Jacques Rousseau, the nature versus culture dichotomy was formulated so as to postulate that although culture became binding, it also represented real freedom — individuals could be coerced to be free by the "general will" (Rousseau 1916: 256-7). But what type of freedom would be possible for individuals within this ultra-democratic totalitarianism?

Like Rousseau, Arendt suggests that it is impossible to reverse the process of "conditioning" that makes culture necessarily binding. We can therefore never return to more "natural" conditions of existence again. It would force the "general will" into existential crisis. However, this type of argument leads to mystical flight, or even fanciful physical emigration away from the problems of our planet. It does not solve the problems; it does not subject the idea of human self-transcendence and mastery to critical, foundational analysis; it does not even examine the reductionist ideas of "nature", culture" and "reason" — the ontological pillars upon which our modern plight has been built.

5. Cyclic destruction of earth versus fateful migration to other planets?

By contrast to the trend (overproduction leading to overexploitation), evident in economically stronger countries, South Africa is trying to prevent the depletion of resources by protecting the environment by means of constitutional legislation. According to section 24 of the South African Constitution (108 of 1996),

> … everyone has the right to –
>
> a) an environment that is not harmful to their health or wellbeing, and
>
> b) to protection of the environment, for the sake of current and future generations, through reasonable legislative and other precautions, that –
>
> - prevent pollution and ecological degradation,
> - promote conservation, and
> - ensure ecologically sustainable development and application of natural resources, whilst promoting equitable economical and social development.

This constitutional human right has forced environmental management to be concerned with maintaining a sustainable balance between economy, ecology and socio-cultural development.

The constitution lays down norms for quality of life and in the Western tradition an easy interpretation is that this kind of management is scientific and technical — human beings supposedly being capable of complete control over nature (Thai-Eng 1997: 159-61). The impracticability of this delusion is apparent as many destructive effects of attempted human mastery are appearing. The decline in natural biodiversity in the light of human interventions that alter the ecology, like the building of dams, is but one example. An example from South African context could be the problems with radioactive pollution of water as a result of goldmine activity. Gold supplies foreign exchange to South Africa, as well as employment opportunities for several countries in the immediate vicinity. The gold contains high concentrations of uranium, destroying a fountain area with the river ecology and underground water sources. The effect on human health and agriculture in the environment is destructive for a long

time. In addition, now that the pebble-bed technique for the use of nuclear energy is proving to be safe, clean, manageable and cheap, a way to earn foreign exchange and create jobs, the chance to stop all the activities is becoming slimmer (van Eden 2006).

Humankind is more than capable of creating an apocalypse by abusing the local natural environment, until conditions are such that human life is impossible. It now tries to find solutions and hope in environmental management and by implication, in more technology. Expectations are that the problems can be corrected by the same erroneous thinking that had caused it in the first place. Books like Alvin Toffler's *Future Shock* are optimistic: we shall surely overcome dirty technology by cleaner microtechnology; we can have colonies of human beings on the seabed in artificial living spaces; we can control social change by a social cybernetics (Toffler 1978: 173). If more technological advances come at a stiff price to the environment, still more of the same technologies may offer a way to save us.

This viewpoint taken to its fanciful extreme would propose the following: Technology will save us by making it possible for human beings to migrate to other planets in the solar system; thus hoping that humankind will be able to move from planet to planet while the universe decays.

Science fiction often "predicts" in some way the marvels of discoveries and inventions of future science and technology. But the idea of interplanetary migration is more than mere science fiction: it implies a deeper shift in imagination. The proposed model of the earth has changed from that of a "machine" to that of a "space ship". This means that earth is seen as a giant life-support system and concepts such as "sustainability" gain importance (Wilkinson 1980: 208). This in fact implies that the earth is itself an analogue of a technical invention like a spaceship, and that humankind can jump from this given technological system to others of a similar kind, whether naturally given or invented.

However, there is no indication of an attempt to solve the problems confronting us, or even to take them seriously. It is rather a Faustian flight from the problems. We already have them on earth: the soteriological expectations from nano-technology, bio-technology. Apparently the utter failures of social engineering did not cause any fear in the engineers.

6. Nature versus environment

In order to escape from some of the binding conditions of nature, human beings have produced another world — a kind of natural-cultural interface, called the "environment" (Arendt 1958: 2, 3, 9). "Environment" covers a wide range: social environments (neighbourhoods), economic environments (workspaces), urban environments, rural environments, ecologies for widelife in game parks, even subterranean environments (mines). An environment is humanly delineated — it is brought about by a cultural activity, even if this is limited to fencing a game park. "Environment" does not denote "nature" as the original, pre-culturally given. We may call the Kruger National Park a slice of "nature" but it is very carefully managed and controlled. The continuous debate about the culling of the elephants in order to create opportunities for other species is but one example of the "non-naturalness" of the park environment.

The concept of "sustainability" belongs more to the environment than to nature. "Sustaining" the environment means to keep nature from changing into a state where conditions make human life uncomfortable. Recent thinkers, especially spiritualistic ones such as Berdyayev and Hannah Arendt, view environmental development as moving towards a future free from binding natural conditions and if based on the assumption that nature is "incomplete" in some way, binding natural conditions may be perceived as a serious threat to the freedom to pursue a meaningful life.

Arendt gives an accurate formulation of the tension between "nature" and "culture" in modern society:

> For some time now, a great many scientific endeavors have been directed toward making life also 'artificial', toward cutting the last tie through which even Man belongs among the children of nature. It is the same desire to escape from imprisonment to the earth that is manifest in the attempt to create life in the test tube, in the desire to mix 'frozen germ plasma from people of demonstrated ability under the microscope to produce superior human beings' and to alter (their) size, shape and function, and the wish to escape the human condition, I suspect, also underlies the hope to extend Man's life-span far beyond the hundred-year limit. This future man [...] seems to be possessed by a rebellion against human existence as it has been given, a free gift from nowhere (secularly speaking), which he wishes to exchange, as it were, for something he has made himself (Arendt 1958: 2-3).

Even in postmodern times the human being continues to regard reduced "nature" as a threat to human nature and human freedom, and tries to break free from "nature" by means of technical "mastery". This must invariably lead to failure, because the human being is part of "nature". However, the search for sustainability of a meaningful life here still remains within the context of a human self-transcendence, an escape from that "nature" which has no place for the higher spirituality of the human being. This is the "nature" of modernity — and it is more than environment, for it is the non-rational substrate aspects of the human being itself. It is not simply the "natural" environment of the human being; it is also "nature" within the human being. In Hobbesian terms, it is the natural brutishness of the human being itself which, supposedly, has to be escaped. From a critical point of view, this poses a serious question neglected by Arendt and most of modernity: is the subrational "nature" in the human being similar to the "nature" of the wolf, the cow, and the ant? For example, is sexual communication between human beings the same as the coupling of two dogs? Is the flight from "nature" in this case not a flight from a totally misunderstood "nature" in the human being? Has not the reduction of "nature" in modernity to a kind of animalistic brutishness created this flight, on the one hand, and the vulgar hedonism for those who prefer to live according to modern "nature", on the other?

For those who identify "nature" with the brutishness — the product of Cartesian reductionism — one must be prepared to sacrifice one's nature, otherwise natural necessity cannot be overcome. Necessity then becomes an inescapable compulsion, in the older Aristotelian sense of "necessity", which defines a situation as "thus and cannot be otherwise".[20] The only freedom then lies in ones's ability to change the form of necessity to some extent: the way in which one uses gravity to walk and to fly differs in form.

20 Historically "necessity" has had many different conceptions. The oldest, known form of "necessity" was logically defined by Aristotle in *Peri hermeneias* (Aristotle 1962: 18b5ff). According to Aristotle, "necessity" was a "reality that was the way it is, and could not be any different". So it followed that there were two formulations: positive necessity meaning "something is like it is", and negative necessity taken as "something is impossible to be otherwise". In the twentieth

7. A non-reductionist approach: stewardship

It has explicitly been shown how modernity reduced "nature" to the subhuman functions in reality. One could summarise these functions as the mechanical, the biotic, the psychical (sense experience, instincts or passions, the sentiments). Beyond these is the peculiarly human part — the part shared with the divine, as Kant would have it — reason. Culture, in its most progressive form at least, is associated with the socio-political and with reason. This does not exclude that the preliminaries of culture may be the products of "nature" — in fact, the instinctual competitiveness forms the basis of progress to the level of rational culture.

Even when "culture" is presented as "rational" or as product of "reason" — surely in a future society when everybody will have reached the rational state — this idea of "culture" is also reductionist. One merely has to read the debates of a few centuries on the position of morality, art, and faith, to understand this. In terms of the modern "nature-supernature" dualism, some would have it that faith is something "emotional" (Lessing), while Kant made it a sub-function of rational morality. Art was considered rational but some Enlightenment thinkers (Diderot, Jacques-Louis David, Kant) viewed the artistic genius as rather instinctual, while Hegel saw it as pictorially rational. In Hume's opinion art and morality are products of sentiment, as is the appreciation of them, but they are so nearly rational that study of them — via our practical rationality — even strengthens our rational scientific capacities.

We avoid complicating the argument with the different types of rationality, or the different possible usages of the term. At this point we simply want to show that the differences of opinion on where to classify faith, the arts, morality, indicate a deeper problem: the dualistic approach has to include some aspects of "culture" under "nature" (art as emotional or instinctive), and others under rational. This suggests three important directions:

> century model logic redefined "necessity" as being dependent on anankaistic propositions, rather than reality. "Necessity" characterised a proposition that was always true, a tautology ("a human is a human") and a statement that was not true, an impossibility ("a human is a non-human") (Kneale 1966: 548ff). The consequence of this, however, is that we cannot say that even the mechanistic type of natural law (such as the law of gravity) has any necessity in itself.

- Avoid categorising all reality into two dialectically opposite parts, for one could not find an explanatory place for so many human functions in such a scheme.
- When categorising, avoid a part-whole approach, for one may then have to force not-A to be a part of A — depending on what you accept as the important whole. This leads to reductionisms — art is part of emotional life, and to totalitarianism on the level of inter-human relationships — all art has to be socially engaged to be good art.
- Consider a wider variety of "categories", each having a right to be recognised as such, where the categories are not parts but rather aspects or ways of relating among entities. One can use the contradictory and dialectal outcomes of reductionisms as an instrument to determine where confusing of categories (reductionisms or "nothing buts") occur.

This is the approach followed by the neo-Calvinist tradition of Reformational philosophy. They followed the anti-reductionist direction of Meinong, Husserl and Comte, and view "created temporal reality" as a unity with many different modes of being (modalities), each irreducible to the other, and each with its own laws. These modalities or modes of being include arithmetic/numerical, spatial, kinematic, physical, biotic, sensitive/psychic, logical, historical, lingual, social, economic, aesthetic, judicial, moral and pistic.

It must be noted that the modalities are clearly distinguishable from one another, and irreducible to one another, but they are not parts of reality; on the contrary, they are aspects. One can therefore not relate them to things in terms of part-versus-whole. The modal distinctions are therefore neither partialistic (as in the mechanistic world picture), nor holistic (as in the organismic world picture). It is not a kind of pluralism analogous to the dualism of body versus soul, for "body" and "soul" represent parts, while the modalities are ways in which individual things relate themselves to one another in a coherent world.

Apart from the Greek dualism of "body" versus "soul", any form of naturalism in its modern reductionist format, or spiritualism of the Hegelian or New Age kind, is also rejected. The advantages of using

this tradition as a model is that it provides a wholistic[21] view of nature and culture, and yet it gives a refined analytical instrument which accommodates the contributions of the reductionist approaches.

The model (to be found more explicitly in the works of Dooyeweerd, Vollenhoven, Stoker and others) is aimed at recognising diversity without sacrificing unity and coherence. The order of the modalities is therefore constructed in terms of an order of complexity (in a vaguely Aristotelian or Comtean sense), rather than as a hierarchy of values (like the rationalist hierarchy of reason versus unreason, or the Plotinian one of unity above diversity).

As is evident from the list of modalities above, the dualism of reason (culture) versus the irrational (nature) is absent. All beings, even stones, have all the modalities, either as subject or as object. Taljaard (1964: 666-8) argues that since all modalities are "natural", one has to say that the ethical and the aesthetical are "natural". This implies that a reductionist concept of "culture" is not acceptable either. "Culture" is not simply something "rational": the cultivation of faith differs according to place and the content of a specific faith.

Reality therefore consists of different aspects (modalities), each of which supposed to be subject to its own set of laws. Some of these laws possess an anankaistic character, meaning that they simply cannot be disobeyed (for instance, the law of gravity). It would, however, be possible for human beings to use anankaistic laws within the limits of their knowledge, like using the law of gravity to put man-made satellites into orbit. Other laws are regarded as normative in character, affording human beings the freedom to choose how they obey them, or not obey them at all. The norm that "thou shall not kill another human being" may find different qualitative expressions in situations of self-defence.

Culture thus touches both the normative and the anankaistic aspects of reality. Humankind has been using the anankaistic laws since it made its appearance on earth to provide for itself, and to express beliefs

21 In order to avoid confusion with the organismic, holistic approach, we use the term "wholistic". It suggests that we are looking for an wide overview of our surrounding reality, while differentiating that which should be distinguished, without losing sight of the belief that reality is coherent.

and sense of beauty. It has also created traditions which indicate a sense normativity and normality: traditions about marriage, raising children, property management, and so on. What is often forgotten, is that the relationship of the human being to the anankaistic aspects are guided not only by the anankaistic laws, but also by norms. The economic relationship of usage of the anankaistic aspect of reality is all too often considered anankaistic itself: from Sir William Petty in the seventeenth century, via Edgeworth to Friedman, economic theorists viewed the "laws" of the "free" market as parallels of, or similar to, the laws of physics (Venter 2002: 300-1). Terms such as "the market mechanism" and "equilibrium" are expressions of this. Behind this lies the Cartesian view that all good science is mathematically deductive. In order to have good science, one has to represent the economic norms as "laws of nature" similar to the law of gravitation — in other words, unavoidable. This leads to stereotypical presentations of being-human, as in David Ricardo's economics, in Friedman (and of course in behaviouristic psychology). However, if the economic agents (human beings) are subject to anankaistic laws when economically active, how can we call them "free agents" in a "free market"? And why is it so difficult for the supposedly automatically equilibrating economic processes to reach equilibrium, whether on the micro, macro, or global level? Could this lack of equilibrium not possibly be explained by arguing that the "laws" of economics are norms, which are differently obeyed in different contexts? Instead of saying the market forces will impose equilibrium, should not one say: One should not buy more on credit than one can pay for within the agreed period of time, given one's income? Is recent legislation in South Africa to enforce responsible credit taking an indication of this normativity? Is Friedman-style inflation targeting through interest rate manipulation by central banks not another admission that there is no such thing as an automatic market mechanism?

Once calculative rationality has succeeded in transforming economics into "the most inhuman human science", the cultural implications of economic activities have swept under the carpet in favour of supply-demand-price analyses. Whether artistically, or religiously, or economically, we cultivate the world, and its use is subject to norms.

The "cultivation" of the world is stewardship: responsible caring. This means that specific norms will come to the fore in specific situations, but that the coherence with all of "nature" must always be respected. Goudzwaard & De Lange (1994) call this "the simultaneous realisation of norms". Some towns seem to have been planned by Euclidean geometrists: straight streets, square residential blocks, ninety-degree street corners. The norms for measurememt and for a certain kind of efficiency have leading here: the norms of aesthetic design, for noise pollution, for efficient traffic flow have been ignored.

The basic coherence, for the Reformationalists, is found in respecting the world as a gift from God, with love as the unifying commandment. Thus one may cultivate a piece of land for self-sustenance, or for profit, and while the norms of economic efficiency will take precedence, the norms of social justice and of bio-homeostasis will always have to be taken into account. The planning of neighbourhoods must take into the account the naturalness of religion, and therefore allow for religious space. It must also take account of the serious disturbance of neighbourhood peace and bird life by the use of loudspeakers by religious groups.

This type of philosophy does not simply write off the entire economic system or technology for a new kind of Romanticism; it rather tries to find a meaningful place for them. It will not be popular in a very relativistic "postmodern" age, since it still insists on norms and laws, but so do all the bills of rights in present-day democratic constitutions.

Furthermore, culture does not necessarily have to be destructive. An example of this can be found in the Christian conceptualisation of the original "cultural mandate". In this mandate, tilling the earth (culture) and caring for it (stewardship) is part of a single responsibility. Production of culture and earth-keeping cannot be regarded as two contradictory tasks within a single mandate (cf Van der Walt 1999: 25). This means that, as far as development is concerned, constructive as well as destructive possibilities are simultaneously present, and it is up to us to decide which course to take.

"Stewardship" is an interesting concept within the Christian tradition, offering some insight as to how we are supposed to develop.

- A steward is a representative of God (*imago Dei*), and in the same way that God rules over creation, his stewards are supposed to rule, in a derived sense, on earth. It is our ultimate purpose on this planet. But this does not give us a license for exploitation (Van der Walt 1999: 21-5).
- Creation is part of God's revelation (or "Word") to humankind, and "Word" presupposes an answer (Goudzwaard 1975: 56). So our rule or development should be responsible.

A non-dualistic and less reductionistic conceptualisation of both nature and culture may offer a more sustainable future. If humankind should regard itself again as that part of nature that opens up inherent natural possibilities, instead of nature's elevated ruler, less destruction would ensue (Van der Walt 1999: 26). How does this relate to environmental management?

There are possibilities for both "nature" and "culture" in every modality. The basis for this is the theory of subject and object functions. Since Galilei the idea of *a priori* secondary qualities, and later of some primary qualities such as the principles of number and space, led to a reduced idea of the extra-mental "thing", which has almost become a "no-thing". Reformational philosophy accepts that there are extra-mental "things", and that such things are structured to be in coherence with other "things". They can cohere subjectively: thus a plant spreading warning chemicals to other plants in the vicinity when eaten by an antelope coheres subjectively with other plants. This is a recently discovered phenomenon in the game-farming industry in South Africa. Antelope are leaf eaters, and after the death of some antelopes (kudus) in a smaller camp, it was discovered that the leaves they had eaten from different trees had become indigestible: they died of hunger with full stomachs. Further investigation showed that, after the kudu had taken a reasonable amount of leaves from the tree, its chemical composition would change and the leaves became bad-tasting and indigestible. A chemical warning would simultaneously be released into the air, and in the surrounding trees the chemical

composition of the leaves changed rapidly. Given the size of the camp, the antelopes had no other option but to eat the indigestible leaves.[22]

The same example can explain something of the theoretical function of "object functions". By contrast to modern subjectivism since Kant, it is assumed that the extra-mental world, although mediated in the knowing process, is not simply a "construct" of consciouness, but it also coheres objectively with other entities, including the human mind. Thus in the present example, the trees and the antelopes are accessible to the game farmer as economic objects. They are not constructs of the game farmer: they are given in, and therefore accessible through a relationship, a possibility in their being-there, to be used for food, and therefore they do have a use-value. In Reformational terms, they have an economic object function. Since time immemorial human beings have used animals like these economically: ie they used them to provide food, clothes, shelter, weapons. They also used objects aesthetically: bones became decorations; they cultivated their religious object function: bones became amulets, fat was burnt on altars.

However, in this case the farmer's antelopes died. He overstepped the boundaries set by the real subjective self-sustaining "mechanisms" of the tree ecology, because their accessibility to economic management through fencing exceeded the norms for stewardly use of creation. The cultivation was careless and greedy; the other norms (care for the whole complex system: its intersubjectivity and its objectivity in other spheres) had suffered from economic overindulgence. The trees are objectively accessible for pruning (eating) by antelopes, and that may be good for them. But once human over-use put severe stress on them, the whole environment created by the farmer suffered loss. This does not mean that disclosing the economic object function of game is as such something destructive. In spite of the massive growth in human population, within a few decades game farming (including the hunting industry) has led to situation where South Africa has now tripled the amount of game that was here a century ago. This is accompanied by a massive recovery of the original ecology.

22 This example is taken from a TV programme on game farming and ecology a few years ago. We do not have a publication reference for it as yet.

To move to a somewhat higher level of abstraction: "Nature"— in the modern reductionist sense — has subject functions in the five least complex modalities (arithmetic, spatial, kinematic, physical and psychical). In addition, it also has object functions mentioned above. The implication is that the subject functions (like specific colour) cause the human subject to experience "nature" in a specific way. And this prevents us from reaching a Kantian perspective: that reality is totally subjective and therefore objectifiable and exploitable. "Culture" (in the Dooyeweerdian sense the more complex modalities) cannot simply then be made object of the method of the natural sciences. In the Taljaardian sense, "nature" and "culture" exist in all modalities simultaneously — however, "culture" in this case is the human interaction with the less complex modalities.[23] To objectify either "nature" or "culture" through the tunnel vision of a single modality (and so reduce) either one, the subject functions will be violated.

This highlights the erroneous foundation of current forms of environmental management. In these management systems, "nature" is regarded as possessing only the "earlier" (biological/physical/psychical) modalities, while "culture" is more concerned with the "later" modalities. "Culture" is absolutised, "nature" is reduced and the bottom line is that it has proved to be unsustainable.

Opposing this, but remaining within the same dialectic, are the Green Movements and some Neo-Darwinists. For them "nature" is untouchable, either because it is divine and all "spirit", and we have to be its adorers, or because the norm or "Law of Nature" is supreme — survival of the fittest: eat and be eaten — and we human beings had no right to escape the process of being eaten (cf FIGU 2001).[24] Ironically, the current severe competitiveness ideology is one of the causes of environmental degradation. There is also the strange cross-breed between the two: on the one hand, the South African organisations for the protection of

23 Reformational philosophy, will not characterise the chemical interaction of trees as "culture".

24 We find this attitude in Mandeville's *Fable of the bees* at the end of the seventeenth century. Mandeville was therefore severely opposed to organised charity. The social Darwinists, such as Spencer, and the mentioned economist Edgeworth have a similar attitude.

animals — with the SPCA at the forefront — do not want, for example, African elephants to be trained and used in safaris; they also object severely against the culling of elephants in game parks where the ecology is under threat by elephant over-population, neither are they prepared to pay for the transfer of elephants to other parts of the world. Nearly extinct species — like Chinese tigers in breeding programmes for release in the wild — are not allowed to be given live prey; neither are petshop owners allowed to give live mice to the snakes they sell. The prey has to be killed "humanely" before being fed to the animals.

This shows a total misunderstanding of the functioning of creation and, in particular, of the need for a simultaneous realisation of norms. The spiritualists will always return to human control, since they believe in an ancient spiritual hierarchy, and it is clear from New Age authors such as Capra that even though their metaphors are organismic and holistic, they have not moved out of the natural scientism of the Cartesian tradition; their orientation has simply shifted from mechanics to biology. The survivalists have forgotten that their metaphors have their origin in capitalist economics, and the more they preach this doctrine about nature, the more they preach competitiveness among all species.

8. Is there any hope?

This study argues that the prevailing approach to environmental management, as far as practice and literature are concerned, is a technical, scientific (human) attempt at "mastery" of "nature" in terms of a severely reduced idea of "nature" combined with a reduced conception of "culture". The basis of these reductionisms lies in postmedieval humanism's approach to reality. In terms of this modern ontology, humankind emerges from "nature" and is elevated beyond its origins, to fill the vacuum left by the medieval supernatural. This deification of the human being, whether in terms of reason, of will to power, existential choice, scientific-technological utopian manipulation, economistic success, or pleasure, is still present in the failed god of irrationalism, and as is clear from the existentialists and postmodernists, elevates humankind beyond the control of heteronomous norms. The aim of "mastery" is economic advantage as instrumental value to the end of

hedonistic, anthropocentric "wants". Arrogant appropriation instead of humility seems to be the consequence of the ideology of mastery.

The effects of this tension on the environment, at least within the window of our ability to know, seem to violate the integrity of continuous processes in creation. The problem we face is the lack of an Archimedean point whereby we can escape space time limits. Thus those who believe that the system will right itself have no clear ground to stand on, neither have those who want to manage for the sake of sustainability, nor those who consider "nature" sacred and untouchable.

We have also tried to show that well-meaning attempts at "protecting" and "management" of the "environment", which is not "nature" itself but a culturally produced entity and by and large the product of the reductionisms and dialectical tensions of modernity and specifically of present-day economism and technicism, are bound to end up in a *cul de sac* because they remain in the grip of the modern "nature"-"culture" dialectic, and are part and parcel of the treadmill of economic growth and the system of global competitiveness. Both the system and its underlying philosophy appear to subject all our efforts to a quasi-cultural determinism from which it is not easy to break loose, especially as long as we teach disciplines such as "environmental management" without seriously questioning the philosophy at its base. The discourse used in this context, such as "management", "environment", and so on, suffers from a neglect in deeper philosophical understanding, and is therefore bound to help recreate the dilemmas.

We do believe, however, that the situation is not hopeless, and we found some clues in Reformational philosophy.

Our first clue is the idea of the simultaneous realisation of norms. A key to dissolving the "nature" versus "culture" dialectic lies in repositioning the human being conceptually, and thus practically, completely inside "nature". Secondly, we have to reform our conceptions of "nature" and "culture" to allow for both diversity and coherence without reduction or absolutisation.

This requires a review of our system categories, both in its scope and in its conceptualisation of the relationships between categories. A system of categories working with contrasting parts of a whole tends

to such dialectical reductionisms as we have taken to task above. More sensitivity for the differences and peculiar characteristics of the wide range of aspects in which reality presents itself is required. It is not that modernity did not see the different aspects, such as morality, faith, the aesthetic, the logical, the emotional, the economic, the legal and many others. It is simply that it denied them a "voice of their own", and thus remained in constant debate about whether this category or that category belongs to "nature" or to "reason", to "body" or to "soul". Thus Turgot and Adam Smith would view our cultivation of the world in an economic sense as both "natural" (instinctual) and "cultural" (a product of reason seeking fairness) as Hobbes did with our cultivation of our social possibilities.

We have to see that categories — and we use the modalities of Reformational philosophy in this instance as our categorical system — in terms of a more holistic view of "nature" — such as that of Taljaard mentioned above — are all susceptible to culture. Cities are not only made inhabitable by fine architecture, libraries, and level streets, but also by the presence of vegetation and other living beings. The question is to allow these to cohere. Such a conceptualisation is provided among other things by the Reformational tradition that recognises the parallel between nature and culture in terms of modalities. "Nature" is supposed to express itself in all the modalities (Taljaard again), including being social, moral, aesthetic, and having the physical traits usually associated with "nature".

Sustainable cultivation of all the modalities obeys the laws and norms which are applicable to all the modes of being, in their coherence. "Stewardship" for the world in this context will mean to take a caring responsibility which does not only take into account the specific norms of one's focus of cultivation, (for example "good for more profit"), but also for example the aesthetic, social and safety norms.

If both "nature" and "culture" exist in all modalities simultaneously, "culture" cannot simply be reduced unless subject functions are violated. The Reformational approach, with both "nature" and "culture" existing simultaneously in the full spectrum of modalities in reality, is therefore proposed to alleviate the dualistic tension and improve sustainability. Examples have been provided in the run of our argument.

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