PART B - WORLDVIEWS IN CHANGE

Purpose: to explore the nature of the current flux and tensions in Western worldviews, the nature and emergence of the postmodern ecological worldview and associated tensions and change in systems thinking, in education, and in environmental education.

Introduction

In section 1 of Part B I look in more depth at the notion of worldview, and at learning levels and paradigm change. I then examine how far it is possible to identify a coherent postmodern ecological worldview in the context of modernism, postmodernism and evolutionary change in culture. I acknowledge the contribution of postmodern thought to cultural evolution, but argue that, given the state of the planet, it is necessary to articulate a revisonary ecological postmodernism that can both subsume and transcend deconstructionism and evoke an appropriate sense of purpose and basis for action that can support the sustainability transition. The essential concepts underlying an ecological worldview are suggested and outlined. Against this context, I then look at flux, debate and change in systems thinking (in section 2), in education (section 3), and in environmental education (section 4) - with particular reference to the challenge of sustainability, and the degree to which a postmodern ecological worldview is - and might be - reflected in these three areas.

1 THE EMERGENCE OF THE POSTMODERN ECOLOGICAL WORLDVIEW

According to Carolyn Merchant, Western culture is moving from the Enlightenment ethic of the domination of nature fostered by a mechanistic and reductionist science, towards a “postmodern ecological worldview based on interconnectedness, process and open systems” (1994, 17). Section 1 of Part B examines how far this movement appears to be taking place, its nature, and the nature of the learning process that it implies.

1.1 Examining the concepts of worldview and paradigm

Within the environment/development/sustainability debate, there have been repeated calls over more than two decades for a fundamental change in the way people value, think and act. Partly, this is borne of frustration that issues do not seem amenable to resolution through conventional approaches. CH Waddington (1977, xi) for example, in a classic book on systemic thinking, pointed to this conundrum earlier:

> I doubt if there ever has been a period in history when a greater proportion of people have found themselves frankly puzzled by the way the world reacts to their best efforts to change it, if possible for the better...recently things seem to have been going wrong so often, and in so many different contexts, that many people are beginning to feel that they must be thinking in some wrong way about how the world works. I believe this suspicion is probably correct.

Since Waddington's time, the call for rethinking has gone deeper. My reading - in 1982 - of the ecophilosopher Skolimowski's claim (1981,vii) that our problems arose fundamentally from a "deficient code for reading nature" and that we needed to know differently, raised some profound questions for me - how could it be that the sum of human knowledge about the environment still amounted to a 'deficient code'? Despite long-held 'green beliefs', my scientific assumption that in principle nature/reality was knowable was severely challenged. It began a personal inquiry that still continues, but my position is summarised by Clayton and Radcliffe's view (1996, 47) that, "As a general principle, all theories in natural and social science are approximations to reality". Claims similar to those of Waddington and Skolimowski are quite common in environmental literature. Thus Brown (1993, 20), commenting in one of the yearly Worldwatch reports on 'The State of the World' (in relation to sustainability) states, "The overriding need is for a new view of the world".

A common theme amongst critics is that the problems 'out there' are intimately linked to 'inner problems' concerning our collective perception and thought processes, including a lack of awareness of our 'in here' condition. Thus, for example, Laszlo, an eminent systems thinker, notes that our concerns regarding global problems are commonly all seen as 'outer limits' - fossil fuel reserves, food producing capacity, climatic stability, population carrying capacity, and so on. The blame is shifted onto nature, and we try to redesign that, rather than look at our thinking - of which the problems are outward manifestations. Laszlo (1989, 25) adds, it is "only by redesigning our thinking and acting, not the world around us", that we can solve the problems. Similarly, Meadows, another key systems thinker and modeller, believes that (as noted above in A.3.2) in order to live within the earth's physical limits, humanity needs to "start transcending self-imposed and unnecessary limits in human institutions, mindsets, beliefs and ethics" (1992, xvii), or in other words, free up our thinking in order to deal with physical constraints. Varela, one of the key thinkers in what has been termed 'the new biology' (which has, incidentally, deeply influenced Capra's work),

states (1987,49), “the chance of surviving with dignity on this planet hinges on the acquisition of a new mind. This new mind must be wrought, among other things, from a radically different epistemology which will inform relevant actions”. Arguably, however, Bateson was the first to suggest that Western culture suffered from a fundamental ‘epistemological error’, in his classic text *Steps to an Ecology of Mind* (1972). Some three decades later, Mary Catherine Bateson (2000, xii), writing a foreword in her father’s reprinted 1972 work notes, “Ecological health continues to elude us - and perhaps indeed depends upon the reconstruction of patterns of thought”.

Such appeals, to a greater or lesser extent, rest on the premise that dominant views of the world are flawed, inadequate, or dysfunctional - that the predominant way we know, think and value is therefore also similarly defective. As I have stated elsewhere:

> Put simply, the case against the dominant Western worldview is that it no longer constitutes an adequate model of reality - particularly ecological reality. The map is wrong, and moreover, we commonly confuse the map (worldview) for the territory (reality).
> (Sterling 1993, 72)

What I would add to this now, is that the map is ‘right’ as far as it goes, but it is its inadequacy that makes it ‘wrong’ or dysfunctional. (In taking this line, I am in step with Wilber 1997 whose methodology assumes that no mind can be 100 per cent wrong, and therefore seeks to integrate partial truths - rather than rely on negation and disproval.) The ‘world problematique’ is ultimately then, as noted above in A.1.1 and B.2.2, a crisis of perception. To understand, that is, ‘stand under’ the problematique and delve deeper, it is necessary - in Cotgrove’s words (1982, 33) - to “grasp the implicit cultural meanings” which underlie debate. In other words, it is first necessary to grasp the meaning, and significance, of the *idea* of worldview or paradigm, and second, understand the nature of the fundamental cultural paradigm that informs current thought.

Paradigm derives from the Greek *paradeigma* meaning pattern or model. Thomas Kuhn’s use of the idea of ‘paradigm’ to explain large-scale change in scientific outlook and culture in his book *The Structure of Scientific Revolutions* (1962) has since given rise to extensive use of the term in discussion of change, to the extent that some commentators now see it as rather meaningless. Hence Button, in his *Dictionary of Green Ideas* remarks: “paradigm can mean a model, a world view, a cultural context, a

consensus, a set of attitudes - almost whatever you want it to mean," while he regards 'paradigm shift' as "the ultimate in green-tinted jargon, to be avoided whenever possible" (1988, 329).

While this may have an element of truth and wisdom, 'paradigm' is nevertheless a very useful and perhaps irreplaceable concept. Henderson (1993 x), the futurist and 'alternative' economist, for example states:

> In spite of Thomas Kuhn's many cautions to me not to over-generalize or to use his definition of paradigm in a social context, I believe a paradigm is a pair of different spectacles which can reveal a new view of reality, allowing us to re-conceive our situation, re-frame old problems and find new pathways for evolutionary change.

The worldview, or paradigm, is a story about the way the world works (Milbrath 1989). I find Capra's definition of paradigm helpful:

> A constellation of concepts, values, perceptions and practices shared by a community, which forms a particular vision of reality that is the basis of the way the community organises itself.
> (Capra 1986, 11)

Thus, I do not find it particularly useful to make a distinction between the concept of worldview, or *Weltanschauung* (which translates literally as worldview but is sometimes used in preference in English), and paradigm, except that - as Capra (1986,11) points out, a paradigm is necessarily a collective term whilst a worldview can be held by a single person.

The worldview, either at individual or collective level appears to be a necessary part of culture. As noted earlier (Fromm 1976), the worldview/paradigm/frame of reference is an inextricable part of culture and of being human. Thus culture and paradigm/worldview are closely related and co-defining. Vickers, a key systems thinker, sees these as systems of meaning which he terms 'appreciative systems' (1968). Marglin (1990, 24) describes cultures as "knowledge systems" which are defined in terms of four characteristics: epistemology, transmission, innovation and power:

> Each system has its own theory of knowledge (or epistemology), its own rules for sharing knowledge, its own distinctive ways for changing the content of what counts as knowledge, and finally, its own political rules for governing

> relationships both among insiders to any particular knowledge system and between insiders and outsiders.

This helps theorise why and how different paradigms / worldviews / cultures / knowledge systems conflict and how they change. Cotgrove's (1982, 33) study of why sets of protagonists in environmental issues tended to "talk past" each other led him to conclude that:

> Paradigms are not only beliefs about what the world is like and guides to action; they also serve the purpose of legitimating or justifying courses of action. That is to say, they function as ideologies. Hence, conflicts over what constitutes the paradigm by which action should be guided and judged to be reasonable is itself a part of the political process.

Therefore, in order to understand thought, opinion and conflict, Cotgrove suggests, we need to grasp the implicit cultural meanings which underlie dialogue. Pepper similarly, in his history of environmentalism, states that those who wish to influence others' thinking "will have to study the history of how their thinking came to be as it is" (Pepper 1984, 2). Implicit in the notion of paradigm is a state of relative unawareness of deep assumptions. Ideas become shared axioms from which other ideas and actions follow:

> A paradigm is the set of preconceptions we bring from the past to each new situation that we have to deal with. The paradigm is...the lens through which we look at the world and it therefore determines what we perceive. A paradigm is a set of beliefs or assumptions we make about the world, normally beneath the level of awareness and therefore mostly never questioned.
> (Stacey 1996a, 257)

This is echoed by Patton (1990, 37) who notes that paradigms have a normative aspect - they tell people what is important, legitimate and reasonable. According to Patton, herein lies the strength and the weakness of paradigms: "their strength in that they make action possible, and their weakness in that the very reason for action is hidden in the unquestioned assumption of the paradigm".

As noted in Part A, Berman make an important and helpful distinction between between two components of paradigm, the *ethos*, which refers to the affective level and norms, and the *eidos,* which refers to the cognitive or intellectual paradigm. Of these components, it is the ethos - he suggests - which is most hidden from people's awareness. In discussion about 'paradigm shifts', we must wonder how deeply the

influence of the mechanistic ethos reaches in our psyche, and whether intellectual discussion about 'ecological paradigms' and 'holism' actually touches this deeper operational level of thought. As noted in A.1.1 above, Heron (1996), a transpersonal psychologist, whose work has been important to my research, comments on the difference between *understanding* intellectually the world in a more systemic way, but still *perceiving* it in a Cartesian way. He suggests a 'significant minority' is in this transitional state of cultural change.

If, as I shall argue in B.1.5 below, postmodernity is essentially 'double-coded', it seems that many of us (but perhaps only Heron's 'significant minority') reflect and manifest two partly complementary, partly contesting paradigms. This, perhaps, is the cause of much confusion, frustrated dialogue, and contradiction in many fields of endeavour, not least education and environmental education. For the 'significant minority' who are trying to explore and articulate the meaning and implications of the new paradigm, as I am seeking to do in this Thesis, this tension is a constant source of tension and difficulty, as well as inspiration.

The modelling of the two key paradigms - *mechanistic* and *ecological* - is an important step in clarifying the situation, but it is not sufficient in itself if we are to avoid only tinkering with the *eidos.* Another implication is that any education for systemic awareness or wisdom will be superficial if it only addresses the realm of cognition, and that it also needs to engage how we perceive and feel. At this point however, I want to now look further at the role of thought in maintaining and in transcending any paradigm.

1.2 Modes of thinking and thought as a system

Inseparable from worldview is *thought,* both in the noun sense of 'body of belief, opinion and ideas' and the active sense, as in 'the process of thinking'. This being the case, it is important to distinguish between a mechanistic view of thought and an ecological view of thought. As noted above, this Thesis is part founded upon the assumption that current world problems partly stem from a flawed view of reality, one which is no longer adequate.

Following the Einstein and Bateson quotations that head this Thesis, it seems that 'trying to solve problems with the same consciousness that created them' is doomed to lead to repetition, and frustration. The implication of the quotes by these writers -and others referenced here, Laszlo, Meadows, Capra *etc*. - is that a dis-*integrated* worldview will lead to a dis-*integrating* world, and that, because of systemic reality, the

dis-integrating world 'plays back' to us whereupon we tend to apply further dis-integrated thinking to try to fix the dis-integration brought about earlier. In systems terms, this is a positive feedback loop – where the elements in the system are mutually reinforcing . However, for many people, at some point, the dysfunction and contradictions that dis-integrated thinking is manifesting in the world precipitates significant learning through which the presence and nature of their paradigm is realised and questioned, and for others, a further step which involves realising the possibility and nature of a different paradigm. In other words, the problems force realisation of anomalies in the worldview and hence change through learning takes place. For the majority however, the paradigm is self-referential and contains it own circularity, the nature of which is described by Bohm (1992, 3):

> The reason we don't see the source of our problem is that the means by which we try to solve them are the source.

Systems theorist Stafford Beer (1985, xiii) has a similar line:

> One of the main reasons why so many problems are intractable, is that they are formulated in such a way as to defeat any solution. We go on trying the solutions that have always failed in the past.

And, as Bateson said much earlier (1972, 456):

> Epistemological error is often reinforced and therefore self-validating.

Critical to this argument is the dualistic nature of the Western thought system which operates on the basis of negation as regards the relation of binary opposites. Something 'is', therefore something else 'is not', or vice-versa. Thus as Marglin (1990, 103) illustrates, according to this 'system of thought':

> Irrationality is what is *not* rational. Nature is what is *not* culture. Health is the absence of illness, and so forth. Oppositions such as subject/object, nature/culture, and mind/body are fundamental in the dominant currents of Western thought. They underlie and frame the very possibility of discourse; they ground thinking in the very reality of things.

This structure also underlies notions of power and control - in terms of you/me; them/us; cause/ effect. The emerging systems view of the world suggests that this *logocentric* (a term coined by Derrida) system of thought is no longer sufficient, and therefore is becoming destructive. Norgaard (1994, 28) for example, traces this effect and the circularity involved in the dominant worldview in his study of development:

> While a consensus is emerging that modernity is a shambles, most of the designs for its reconstruction rely on many of the same materials, the beliefs of modernism.

To address this problem in a radical way, it appears that we should in some way step outside or go beyond the dominant paradigm, as it affects individual and social levels of thinking. An inclusive and systems view of thinking, according to Bohm, is essential. He therefore sees thinking itself as a system, as a field of connectivity. According to Nichol (1992), Bohm's view is that body, emotion, intellect, reflex and artifact (that is, the physically manifested product of thought, everything from 'knife' to 'city' for example), should be seen *"as one unbroken field of mutually informing thought"* (my italics). These elements interpenetrate to such an extent that we should see thought as a system - concrete as well as abstract, active as well as passive, collective as well as individual (Nichol 1992, xi).

However, according to Bohm, this system displays a systemic fault as much thinking often is not cognisant of what it is doing, of how phenomena result from it, and yet then struggles against these results. Thinking is not fully aware of its own powerfully creative (or destructive) participatory nature – rather, conventional "thinking about thought" is based on a belief of objectivity, a belief that thought reports and describes (what is believed to be, and appears to be) an independent external reality. Rather, says Bohm, *thought co-creates reality*; thought has systemic consequences. This non-recognition of the nature and role of thinking itself, is a systemic fault:

> Now, I say that this system has a fault in it - a *systemic fault*...that is all throughout the system...You may say "I see a problem here, so I will bring my thought to bear on this problem". But "my" thought is part of the system. It has the same fault as the fault I'm trying to look at, or a similar fault...in dealing with it, we use the same kind of fragmentary thought that produced the problem. (Bohm 1992, 18-20. His italics)

This is a critical argument in this Thesis. In systems thinking terms, this state is known as a 'trap' (a term which was used by British systems thinking pioneer Sir Geoffrey Vickers 1972). This trap can only be transcended by an awareness of our thinking, at least 'thinking about thinking', and preferably by 'thinking about thinking about thinking' which relates to Bateson's state of Learning III. Thus, Bohm calls for what he calls '*proprioception'*, meaning self-perception - a state of open learning through which

thinking based on accumulated reflexes may be reordered in favour of the generation of insight, both at individual and collective levels.

> Thought should be able to perceive its own movement, be aware of its own movement. In the process of thought there should be awareness of that movement, of the intention to think and of the result which that thinking produces. By being more attentive, we can be aware of how thought produces a result outside ourselves. And then maybe, we can be aware of how thought produces a result within ourselves.
> (Bohm 1992, 123)

By using a systems view himself then, Bohm is describing - I believe - the need for a thought system to self-reflect and learn in order to be a healthy system. Clearly, a second-order systems view of systems, what Mead (1968, quoted in DiSalvo 1989) terms “a way of pointing to the observer’s inclusion and participation in the system” invokes a logical paradox of self-reference. While in a formal sense there is no logical escape from this paradox, it appears to me that Bohm (and indeed Buddhist and other traditions of awareness) show us we can be aware of our thinking. Whilst he does not use the word ‘emancipate’, Bohm wants people to liberate themselves from conditioned responses and thinking (he uses the terms ‘reflex thinking’, which invokes the notion of reflexivity).

The problem with the mechanistic worldview is that it gives rise to a view of reality which is both self-referent and exclusive. Like the prisoners in Plato’s famous allegory of the cave, those held in the dominant paradigm tend to be unaware of any other reality. As Merchant says:

> So deeply does this way of thinking become that it is presumed to be reality by mainstream society. So powerful is the mystique of reason as instrument in the control of nature and human bodies that it banishes other modes of participating in the world to the periphery of society.
> (Merchant 1994, 4)

To recognise this state and go beyond, we need to reperceive perception, to think about thought, to pay attention to the thought system. We need to see thought and its manifestation, including the body/mind, and society, and perhaps human-related environmental change, as essentially one system. These propositions, which might be seen as revolutionary in the West - and indeed are so as part of the new paradigm - resonate with ancient traditions in Eastern philosophies such as Taoism and Buddhism,

where daily practice seeks to heighten consciousness, partly through observation of ordinary states of awareness, thinking and feeling. Such practice of what is commonly termed ‘mindfulness’ allows insight into how we ordinarily create our own reality in a relatively non-aware way. It allows us to move outside our ordinary thought system. Such practice is a daily reality for millions of individual people, but changing the collective consciousness and culture appears to be a challenge at a different level.

Elgin (1994, 247) points out that the full name for the human species is *homo sapiens sapiens*, sapient meaning wise. Hence, we have the potential to be doubly-wise. Elgin suggests that “our highest potential as a species is our ability to achieve full self-reflective consciousness, or ‘knowing that we know’ ”. This links with the quotations (given in A.2.1 above) from Laszlo (1997) regarding the need for “new ways of perceiving and visioning oursleves, others, nature and the world around us”, and O”Riordan and Voisey”s (1998) suggestion that the sustainability transition requires “new ways of knowing”.

The critical question, if the above argument is valid, is how individually, institutionally and culturally we might become more self-aware and move towards a more complete, more healthy, participatory worldview. This echoes the comments made in A.2.1 above about social learning and the need for conscious acceleration towards sustainability. The next subsection takes this further by looking in more detail at Bateson’s theory of learning levels (introduced in Part A), which appears particularly relevant and promising in helping understand the nature of paradigmatic levels and change.

However, I first want to mention briefly the phenomenon of *non-learning* through fear or denial, at both individual and collective levels. This pertains both to the non-recognition of problems and of ‘incoherence’ in the worldview, and suppression of the ‘dark’ side of personality, which is commonly worked on in psychotherapy. According to Bohm, the non-recognition of the evidence of incoherence is itself evidence of incoherence. This is an area which the growing study of ecopsychology (Roszak *et al.* 1995) has given attention. Despite its very clear importance, I feel this area lies outside the scope of this already wide-ranging study (although I touch on it in B.1.4 below). What I will say is that learning is critical and fundamental to systems health in any living system, and this includes our own thought system. What is at issue, in relation to sustainability, is the nature of the learning that is required and the *level* at which such learning takes place. This is the next topic.

1.3 The nature of paradigm change and Bateson's learning levels

The theory of logical types and of associated learning levels, is very useful in helping understand change, as outlined in Part A.3.5. Much, if not most, discussion of change and learning - including the education for sustainability debate - does not differentiate between levels or qualities of change, and this seems to be a major weakness in progressing debate and practice. This is where Batesonian theory can make a major contribution, but it is little recognised as yet in sustainability education debate.

I am concerned here with deep change both for individuals and wider society (and by implication also institutions, and organisations in society including educational institutions). As we have seen, paradigm change is essentially about *learning* - if there is no learning, there can be no paradigm change. But at the same time, it is clear that perception of paradigm - seeing *through* rather than *with* paradigm and questioning basic assumptions and beliefs - must involve a particular quality of learning. Day to day learning, that goes on within and outside learning institutions, is not of this type. A good deal of learning - for example, how to fix a car, operate a computer, cook a meal, or even pass most exams - does not require examination of personal or societal belief systems. This is 'functional' learning, 'basic' or 'simple' learning, or 'informational' learning - these are all terms describing the nature of learning at this level.

Therefore, we need models which help us understand levels and qualities of learning. Let us first look at some definitions of learning. Curiously, many books and papers that I've consulted often do not attempt to define learning in any depth, but are concerned with how to make 'whatever it is' more effective. As Bateson (1972, 253) suggests, "The word 'learning' undoubtedly denotes *change* of some kind. To say *what kind* of change is a delicate matter". Jarvis, Holford and Griffin (1998, vii) state:

> Learning is as crucial as breathing. Learning is the process through which we become the human beings we are, the process by which we internalize the external world and through which we construct our experiences of that world.

This may be a useful description, but the sort of learning described here might still be conformative rather than transformative. By contrast, Senge (1990, 13-14) suggests the possibility of deeper change in his definition:

> Learning involves…a movement of mind. Real learning gets to the heart of what it means to be human. Through learning we re-create ourselves. Through learning we become able to do something we never were able to do. Through

> learning we reperceive the world and our relationship to it. Through learning we extend our capacity to create, to be part of the generative process of life.

My own definition, based on Batesonian thinking, is that learning may be defined as a 'difference in the learner as a response to difference'. Or to use other words, a change of meaning and a 'correction', as a response to change (or novelty). Without some discernment of difference, there can be no learning (the fish unaware of its watery environment is sometimes given as an example of this idea). This learning is not linear, but a systemic process involving feedback loops between the learner and the environment. If we take Senge's idea that learning is a *movement of mind* - and this seems an apt metaphor from a neuroscience point of view - any learning may result in a smaller or larger movement, involving both *meaning-making* and *correction.* As noted above, much everyday learning does not result in too much 'movement', nor does it need to - such functional learning does not require us to re-examine our beliefs, and everyday life would become impossible if it did.

As stated in Part A, it is possible to discern a number of *levels* or staged orders of learning which help us understand the nature of learning that is associated with paradigm change. Bateson was the first to distinguish these learning levels, which are explained in his 1972 *Steps to an Ecology of Mind,* but were initially suggested in a paper 'The Logical Categories of Learning and Communication' written in 1964 and presented to a 'Conference on Worldviews' in 1968. Interestingly, Bateson did not include 'Learning III' in his theory until 1972, seven years after he had written his first paper on the theory of learning levels. The theory was based on his understanding of Russell and Whitehead's theory of logical types as exemplified in their work *Principia Mathematica* of 1913. This theory states that no *class* of objects can be a *member* of itself. Thus, the class of 'chair', or 'dog', for example, is different from an specific *example* of the class, an actual dog, or chair. This, interestingly, is a distinction that toddlers quickly grasp, yet confusion of logical levels in discourse is common. As Watzlawick, Weakland and Fisch state (1980, 49):

> In all our pursuits, but especially in research, we are constantly faced with the hierarchy of logical levels, so the dangers of level confusions and their puzzling consequences are ubiquitous.

Not least, this applies to discussion of paradigm and paradigm change, where *levels of paradigm* can be (and are) confused.

Applying the theory of logical types to learning, Bateson suggests that, beyond what he terms ‘zero learning’, there are three learning levels.

Learning I

“deals with the narrow fact or action” (Bateson 1980, 168), and “is a correction of errors of choice within a set of alternatives” (Bateson 1972, 293). In Learning I, “the organism is changed without an alteration in learning capacity” (Bateson and Bateson 1988, 168). I interpret this as learning within a given set of alternatives, that is, within paradigm.

Learning II

“deals with contexts and classes of context” (Bateson 1988, 163). It is “a change in the set of alternatives from which choice is made” (Bateson 1972, 298). This is learning the context of Learning I. Berman (whose 1981 book is largely informed by Bateson), suggests Learning II is:

> Understanding the nature of the context in which the problems posed in Learning I exist; learning the rules of the game. Equivalent to paradigm formation.
> (Berman 1981, 346)

So this is a change in the set of alternatives, which I interpret as paradigm change because a new paradigm presents a new set of alternatives. However, Bateson distinguishes between ‘mere replacement’ of premises and ‘facilitation of replacement’ (1972, 302), the latter equating to Learning III. I take ‘mere replacement’ to mean that it is possible to adopt an alternative paradigm without fully understanding it, or its relation to that which it replaces.

Learning III

is “a corrective change in the system of sets of alternatives from which choice is made” (Bateson 1972, 293). This is the ‘context of contexts’, a transparadigmatic state which represents a mastery of paradigm. Berman (1981, 232) suggests it ‘is learning *about* Learning II, about your own character and worldview’. As noted above in A.3.5, Bateson thought that attainment of this level of learning was unlikely for most people.

However, some commentators appear to interpret Learning III as being a little less unattainable than Bateson himself suggested. For example, Reason suggests (citing Skolimowski 1994) that Learning III “implies an experience of self much more fully in

transaction with others and with the environment, a participatory self or participatory mind" (Reason 1995, 3). From my reading of interpretations of Learning III, there appear to be two versions. One is the transpersonal or spiritual (which Bateson himself implies) which appears to be equivalent to the Eastern notion of enlightenment, or the 'Western' peak experience. In Senge's terms, this represents a very significant movement of mind, a *metanoia,* which, as Senge points out (1990, 13), means *meta* - above, or beyond, nous - *mind*. The other interpretation is more pragmatic. This involves *conscious choice* of paradigm, in full recognition of the existence of alternatives. Hawkins (1991) elaborates this important distinction. He recognises that one way of interpreting Learning III is to follow Bateson - that such learning is a state of enlightenment attained by only a few, for example, Zen masters. But he adds:

> The other more useful way of viewing this level is that it provides temporary access to a higher logical level of awareness, where we have the space to become free of our normal perspectives and paradigm and constraints to see through them rather than with them, and thus create the space to change them. (Hawkins 1991, 172)

- Keypoint: The implication here is that Learning III brings us to a full awareness, which (perhaps inevitably) leads us towards a critically aware, systemic, participatory paradigm which reflects 'down' and is made operative *back across* the nesting learning levels of II and I.

To paraphrase Varela, this is a 'new mind', expressing a different epistemology which in turn informs new actions (Varela 1987, 49). In this way, learning and being as a whole is transformed.

It is important to underline that, if we follow the transpersonal interpretation of Learning III, there is some conflict between this interpretation and the logic of other three-level models of learning which see the third level as equating with realisation of and change of epistemology. The conflict arises because Bateson viewed Learning III as rare, while other three-level models view epistemic learning as more practicable and attainable - if still difficult. For this reason, I tend towards a pragmatic view of Learning III which more nearly equates with the models of epistemic learning and educational change that I employ in the Thesis (drawing particularly on Bawden's work). At the same time, I in no way deny the reality of deep spiritual experience which seems to me to be a related but different kind of higher order learning. Roger Packham, previously a colleague of Bawden's at Hawkesbury College, notes that both interpretations of Learning III

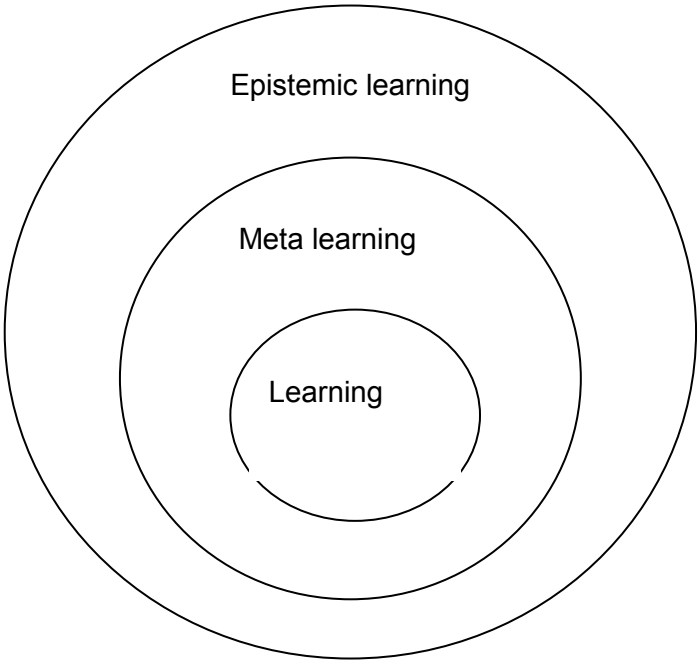
"require the learner to experience the relativity and temporariness of all mindsets" (Packham 1998, 3). I would suggest that experience of Learning III as Bateson saw it would certainly involve a change of epistemology (as he himself stated), but in contrast, Hawkins' pragmatic Learning III involving epistemic change would not *necessarily* lead to the spiritual experience that Bateson implied (though it might).

It is important to state that Bateson's distinction of learning levels was seminal in the development of similar models that later followed. Thus for example, Argyris and Schon (1980) acknowledge the origin of their distinction between single-loop and double-loop learning in Bateson's work on learning levels. Similarly, the staff of the Centre for Systemic Development which was at Hawkesbury, in Sydney, acknowledge that they found Bateson's framework a powerful model for their "understanding of learning and its link to systemic thinking and the ecology of minds" (Bawden and Packham 1993, 6). The Hawkesbury model was also based on the work of cognitive psychologists Kitchener (1983) and Salner (1986) which distinguishes between three levels of cognition - being cognition, metacognition, and epistemic cognition. Bawden and Packham describe these levels thus:

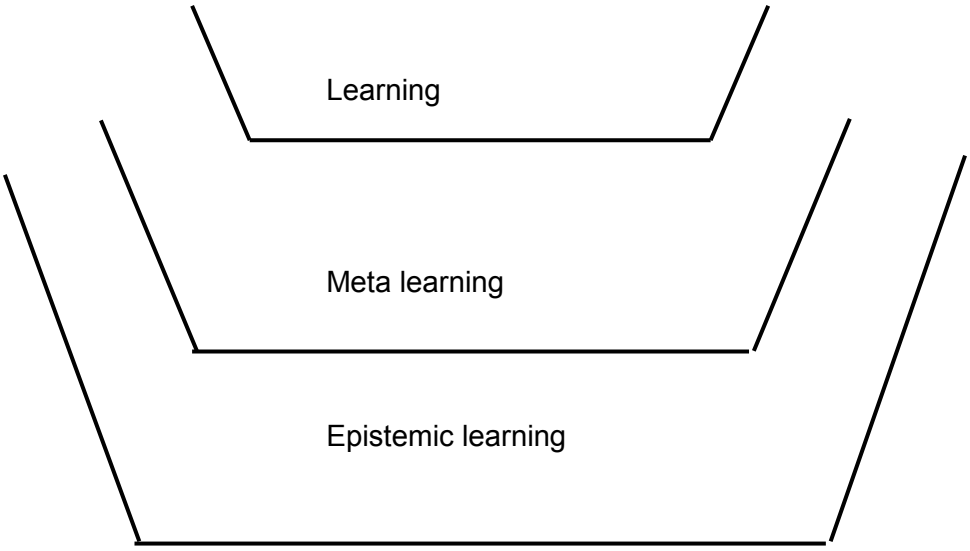
- Level 1 *learning* or cognition. Basic information processing (perceiving, reading, speaking, computing, memorising etc).
- Level 2 *meta-learning* or meta-cognition. This is learning about learning, or knowing about knowing. This is "about the process of learning and what that reveals about what we are learning about the matter to hand at level one" (Bawden 1997a, 27). It is self-reflective evaluation and correction (Packam 1998, 4).
- Level 3 *epistemic learning*, or 'learning about learning about learning'. This involves "thinking about and evaluating the foundations of thought itself" (Bawden and Packham 1993, 6), and is about the "frameworks or worldviews which provide the context or perspective through which we are both learning about learning, and learning about the matter to hand" (Bawden 1997a, 27), that is, at the 'lower' levels. Epistemic learning, they say, "is a crucial proposition with extremely important connotations for education" (Bawden and Packham 1993, 6).

Importantly, the Hawkesbury team do not see these levels as a simple linear progression (as in a ladder where the rung below is 'left behind'), but as nesting systems whereby the higher level subsumes and incorporates the level below, and influences the level below (see Diagram B.1).

Diagram B.1: Learning levels



Alternatively, these levels can be shown as “nests”.



We can now elaborate the learning levels again, by using sets of linked phrases:

Learning I	learning	learning	thinking	knowing
Learning II	meta-learning	learning *about* learning	thinking *about* thinking	knowing *about* knowing
Learning III	epistemic learning	learning *about* learning *about* learning	thinking *about* thinking *about* thinking	knowing *about* knowing *about* knowing

An analogy derived from the common saying that one 'can't see the wood for the trees' perhaps provides a useful metaphor: Learning I might be only 'seeing the trees', or working within the paradigmatic 'wood' (subparadigm level) the existence of which is itself unperceived. Learning II might be stepping out and seeing the wood as a whole, recognising its existence for the first time, and having some idea of the possibility of an alternative wood (paradigm level); Learning III might be the helicopter view, seeing fully that a number of alternative woods or paradigms exist and may be chosen between (metaparadigm level). To continue the analogy, one cannot stay in a helicopter forever, and therefore we need to 'come down' from temporary access to the metaparadigm level to practice at the paradigm and subparadigm level. What these models clearly suggest is that 'lower levels' of learning are less difficult and more everyday in nature. Indeed, theorists make a distinction between basic learning and 'higher order' learning levels. The argument, to which I shall return, is that:

- Keypoint: sustainability requires epistemic or higher order learning in order to transcend the trap of unexamined assumptions that have lead towards or exacerbated conditions of unsustainability.

I will now examine learning levels in more detail, drawing parallels between different writers' interpretations to enrich the discussion. As noted, Argyris and Schon's (1978, 1980) concepts of *single-loop* learning, and *double-loop* learning derive from Bateson's earlier work and use of these terms. Learning I and II also correspond with Schon's idea (1987) of *reflection in action* and *reflection on action* respectively, and with the ideas of *simple (or adaptive) learning* and *generative learning* (O'Connor and

McDermott 1997). Thus, a number of writers/researchers echo Bateson's view of levels of learning, and all differentiate between basic learning and higher order learning.

Bateson also used another terminology, making a distinction between 'first order' learning or change, and 'second order' learning or change, and these concepts also tie in directly with the learning levels. Ison and Russell (2000, 229) define these terms as follows:

> Second-order change is change that is so fundamental that the system itself is changed. In order to achieve (this) it is necessary to step outside the usual frame of reference and take a meta-perspective. First-order change is change within the system, or more of the same.

Thus, first order learning and change is akin to what Clark (1989, 236) calls "change within changelessness", and is often geared towards effectiveness and efficiency - 'doing things better', rather than 'doing better things' (and rather than, at a deeper level still, 'seeing things differently'). Watzlawick, Weakland and Fisch (1980, 50), make the distinction thus: "there are two different types of change: one that occurs within a given system which itself remains unchanged, and one whose occurrence changes the system itself". Clearly then, learning can serve either to keep a system stable or enable it to change to a new state in relation to its environment. While these ideas are often used to describe organisational change, they apply equally to worldview/paradigm change where the worldview is itself seen as a system of thought.

Single-loop learning/adaptive learning/first order learning tends towards stability and maintenance - in fact 'maintenance learning' is another term for this order of learning. This learning does not affect the individuals' or an organisation's or a culture's worldview. For example, in their description of single-loop learning in the context of an organization, Argyris and Schon suggest this learning occurs when members of the organization respond to changes in the internal or external environment by "detecting errors which they then correct so as to maintain the central features of organizational theory-in-use". Strategies and assumptions may be modified but "organizational norms...remain unchanged" (1978, 132). Here the word 'error' means "a match or mismatch of outcome to expectation which confirms or disconfirms organizational theory-in-use". So this is maintenance learning - adjustments or adaptations are made to keep things stable in the face of change. In most cases, this is not a 'bad thing' but a necessary learning response to ensure stability. Bell and Morse (1999, 102) use Maturana and Varela's notion of *autopoesis* in living systems (an important idea of self-

renewal and self-organisation, which I revisit in **Appendix I**) to explain how organisations, or belief systems can act as relatively closed systems in relation to a changing environment. But this becomes a 'bad' thing, or a maladaptation, when a first order change is neither appropriate nor an adequate response to significant change in the environment.

O'Connor and McDermott (1997, 122/123) use simpler language and explain that Level I learning is everyday learning:

> Most of the time we act on feedback. We see whether our decisions and actions have taken us any nearer our goal. If not, we do something else. If so, we do the same again. This all happens in an instant; it takes far longer to describe than do…Single loop learning is a balancing feedback loop and tends towards adaptation and stability. In organizations, it tends towards procedures, institutions, 'the system' of doing things.

So learning which serves stability tends to be characterised by negative feedback loops, which dampen change. Double-loop learning/second-order change, by contrast, is deeper learning where change tends to be characterised by positive feedback loops between the system and its environment, whereby both attain a new state (Banathy, 1992).

The theory of levels of learning is a generic theory that has broad application, in the same way as the theory of logical types from which it derives. It is important then, to state that learning levels can be used to understand *situated learning* - such as 'problem-solving' situations in everyday life, to organisational and group learning, or to change in professional paradigms - which *do not necessarily involve change in cultural worldview.* For example, Watzlawick *et al.* (1980, 49) suggest that psychologists largely talk about first order change, that is change from one behaviour to another within a given way of behaving, whilst psychiatrists are predominantly concerned with second order change, that is, the change from one way of behaving to another. Watzlawick *et al.* add that these professions are not often aware that they are concerned with different levels of change, and that confusions and controversies could be avoided if they were.

My interest here is the use of learning level theory to understand change in individual and shared cultural worldview. So for example, in environmentalism, those who look for solutions within a set of 'light-green' behavioural change responses, such as recycling,

using more public transport and so on might be seen as working at the level of first order change. It has value but the options do not threaten the bases of the existing structural systems or belief systems. Second order change however, questions assumptions and seeks deeper ecological solutions which involve structural change and valuative change. The counter movements associated with anti-globalisation/localisation and the World Social Forum (whose slogan is 'another world is possible') perhaps represents this deeper analysis. This is a distinction between a simple environmentalism and a deeper 'second order' 'ecologism" (Dobson 1990) which is examined further in **Appendix I.**

Learning levels may be seen as a set of nesting systems where "each provides a context for the other levels nested within it" (Brown and Packham, 1999, 10). As noted above, learning involves change. In systems parlance, learning is seen as 'self-correction in response to feedback'. Brown and Packham suggest Bateson's learning levels are "a hierarchic classification of the types of error which are to be corrected in the various learning processes" (1999, 10).

From this view, we can see that progress through the learning levels is a function of learning or correction, when and where a particular level is no longer adequate to meet challenges or problems faced. Yet, as we have also seen, learning can also serve to stabilise or maintain the learner, the group, or belief system. This model illumines the problem with social learning for sustainability. Faced with interrelated problems of immense complexity (such as the 'world problematique' reviewed above), arguably society is doubly constrained - first, with most attention and debate focussed within lower order learning levels and second, within an inadequate cultural paradigm. Current paradigmatic turmoil associated with postmodernism may be seen as a possible precursor of constructive change - that is, corresponding with a second order stepping out and evaluation of the modernist paradigm. But society as a whole has not yet achieved the breakthrough towards an ecological alternative necessary to self-correction - despite the mounting feedback of social, economic and environmental dysfunction revealed in such reports as annual Worldwatch *State of the World* reports, WWF's *Living Planet Index*, or UNEP reports such as the *Global Environmental Outlook* series, and as revealed in our daily newspapers. Indeed, there seems to be a worrying degree of denial or non-learning.

- In sum, where the whole cultural paradigm is at stake, my understanding is that Learning II is a realisation of the limits of a dominant paradigm, and a move

> towards an alternative, even where the basis for that alternative may not be fully understood. This is, I believe, what is happening with the emergence of an ecological worldview. Learning III however, may be seen as mastery of the *class* of paradigms, the 'context of contexts' whereby the sets of alternatives are apparent. It affords an understanding of the choice of paradigm that then might be consciously made at the Learning II level of operative paradigm, which in turn would influence the nature of learning and choices at Learning I levels. This more adequate operative paradigm, as far as we can see or know, appears to be the ecological worldview.

At this point, I want to include a lengthy quote from Watzlawick *et al.* (54, 1980)

> …it is our experience that second-order change appears unpredictable, abrupt, illogical etc only in terms of first-order change, that is, from within the system. Indeed, this must be so, because second-order change is introduced into the system from outside and therefore is not… understandable in terms of the vicissitudes of first-order change…But seen from outside the system, it merely amounts to a change of the premises governing the system *as a whole*…..Any change of *these* premises would then have to be introduced from a yet higher level (i.e. one that is *meta-meta* to the original system and *meta* to the premises governing that system as a whole). However - and this is an eminently practical and crucial point - to effect change within the original system it is sufficient to go only as far as the meta-level.

This has a number of implications:

1. that higher level change cannot be understood from the vantage point of lower levels, (Bateson notes that "no amount of rigorous discourse of a given logical type can 'explain' phenomena of a higher type" 1972, 265),
2. that those experienced at higher levels of change understand change at the levels below and are more likely to be able to induce next level change in a system,
3. that it is not possible (probably) to jump a learning level i.e. from first order to third order change, and it is necessary to experience second order change to achieve third order change. (This *can* be a rapid process however.)

There is another critical point here too. If the emergence of the ecological paradigm is largely a Learning II 'metacognition' phenomenon, then it can be argued that its emergence can only be accelerated (a need articulated by Clark 1989, Brown 2001,

Gardner 2001) if sufficient members of society experience Learning III - at least in 'epistemic terms', if not in 'enlightenment terms'. Hawkins (1991, 178) (in the context of organisational change) puts it like this:

> It is not possible fully to understand a level of learning from within that level… we need some people in organisations to be concerned with and involved in Learning III before we can possibly improve Learning II functioning. An organisation needs not only its doers and operatives (Learning I); its strategists and thinkers (Learning II); but also its men and women of wisdom (Learning III).

Using this model, I would suggest that:

- Keypoint: the ecological worldview is emerging at *both* Learning II level and Learning III levels.

Using Bateson's terms 'replacement' and 'facilitation': at Learning II, it is a partly understood replacement of modernism and mechanism with ecological thinking; at Learning III, it involves a radical reappraisal and evaluation of the influence of dominant paradigms on our thinking and the facilitation and conscious choice of ecological bases as an alternative epistemology, then made operative at the paradigm and subparadigm levels 'below'.

Hawkins (1991, 178) suggests that double-loop/second order/Learning II alone is insufficient. Although it helps us move from 'efficiency thinking' at Learning I level, towards 'effectiveness thinking' at Learning II, "it fails to address the fundamental question: effective for what, or to what end"? Without Learning III, he suggests, there is a danger of creating double-loop learning organisations that "are more effective against short-term economic indicators, but whose very success is disastrous for the planet" (179).

- Keypoint: Learning III, says Hawkins, shifts our attention to the context of planetary survival, and the evolutionary need - a condition of (what he calls, borrowed from Torbert) 'integrative awareness'. Hence, Learning III is associated with epistemological and perceptual change and a transpersonal/transorganisational ethical and participative sensibility.

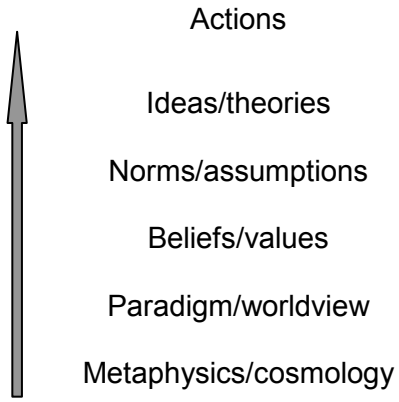
I am aware that such a rationalistic description fails to capture the quality of experience that Learning III appears to entail, the 'recursive vision' and 'aesthetic space' beyond cognition that Harries-Jones (1995, 4) - following Bateson - suggests "is necessary to any ecological perspective and hence to our own survival".

Another implication of the learning levels model, is that those steeped in the mechanistic paradigm at Learning I and II are unlikely to fully understand the ecological critique or alternative. Similarly, reductionists have more trouble understanding holists, than holistic thinkers have understanding and using reductionism where appropriate. This is certainly my experience, and also seems reflected in environmental debate (Cotgrove 1982). Consistent with the theory of learning levels, is the idea of *systemic levels of knowing,* and this is outlined in Box B.1 below.

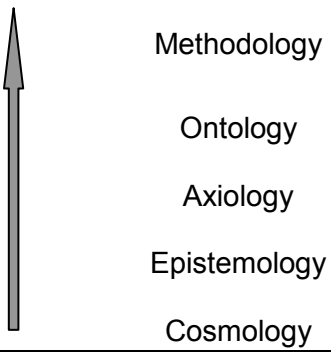
Box B.1: Systemic levels of knowing

This is another use of the nesting systems model which suggests an interrelated hierarchy. I have not found this idea written down simply quite in this way, but have seen it endorsed by the ecophilosopher Henryk Skolimowski in a lecture at Schumacher College held in July 1993. Similar hierarchical models however, include:

- Slaughter's (1995, 151) 'hierarchy of knowledge' (Wisdom, Knowledge, Information, Data)
- Heron's (1992, 20) idea of four modes of the psyche (Affective, Imaginal, Conceptual, Practical) and
- Banathy's hierarchy of learning (Wisdom, Understanding, Knowledge, Information, Data) 1991, 77).



Alternatively, another way of stating this relationship might be:



It is not important and probably not possible to say with certainty that these 'layers' exist in human thinking and in this order. But nevertheless, the model is a very useful way of thinking about how deeper perceptions and conceptions inform everyday thoughts and actions, even when their influence is not recognised. Skolimowski's point was that each level towards the top of this 'iceberg' (my analogy, not his) was a manifestation of the levels below. (To give an illustration: Lawton (1989, 3) suggests, "Every statement that a teacher makes in a classroom is value-laden, connected with ideas about the purpose of education, probably connected with more general values and beliefs, and maybe with the purpose of life. So it is with educational planners and curriculum developers, whether they realise it or not.")

Thus, the more immediate, practical, visible end of knowing is informed - whether we realise it or not - by our deeper individual and shared orientations. The implication is that the reconstruction of Western thinking arguably has to, as far as possible, include the *whole system* of knowing: in other words, epistemic change is necessary.

This model - like the learning levels model above - helps clarify reasons for confusion in debate between parties. To illustrate: not only might two groups of people find it difficult to communicate through speaking from different paradigmatic bases (this is Cotgrove's finding, reported above), but the focus of their consciousness might be at different levels of knowing. For example, there is often a gap in communication between those interested in 'practicalities' and those interested in theory and ideas. Another implication is that the higher up the model, the more divergences exist - rather like the many twigs and branches arising from a common trunk. This means that:

- Keypoint: those who hold different arguments, perspectives and interests at the 'top end' *can still share fundamental beliefs and epistemological and metaphysical premises nearer the foundational end of the system of knowing* (Norgaard 1994).

Thus, it is not uncommon for politicians, for example, to argue over policies yet share beliefs and assumptions at a more fundamental but unarticulated level. Further, they may argue for 'radical change', but a deeper level, such change is still founded on unaltered premises. Similarly, research paradigms in social science or in environmental education may appear in contestation at one level, yet share the same bases at a more fundamental level: this is an important issue I return to in Part C.

In sum, learning level theory provides an extremely helpful insight on different qualities of learning experience which is applicable to the problem of worldview change. It is important to state that I am not suggesting that everybody needs to attain Learning III. Certainly - following Bateson's explanation of this level - such attainment would be impossible. But I am suggesting that significant numbers, particularly in the education community (which is ostensibly responsible for learning policy and provision), need to experience some degree of epistemic learning - through which paradigm change at the operative level of Learning II would be made more effective and widespread.

The next subsection looks briefly at how the dominant epistemology came to be.

1.4 The bases of the Western worldview

Many writers, writing from a broadly ecological perspective (Koestler 1959, Berman 1981, Capra 1982, Ponting 1991, Marshall 1992, Tarnas 1991, Spretnak 1997, to name a few), have critically traced the development of the modernist Western worldview, rooting it in Greek thought or earlier, but seeing its flowering mainly occurring in the Scientific Revolution of - mainly - the 17th century. Others, for example, Eisler (1990) see the current dominant worldview and its alternative having a lineage that goes back to Western prehistory. Eisler's study distinguishes between what she terms 'dominator' and 'partnership' models of social organisation, and suggests that "the original direction in the mainstream of our cultural evolution was toward partnership but that, following a period of chaos and almost total cultural disruption, there occurred a fundamental social shift….to a dominator model" and, at that time in prehistory, "the cultural evolution of societies that worshipped the life-generating and nurturing powers of the universe - in our time still symbolised by the ancient chalice or grail - was interrupted." In Eisler's view, technologies "designed to destroy and dominate" and symbolised by the Blade, replaced those designed "to sustain and enhance life" and it is this continuation of the dominance of the Blade form of technologies up to the present "rather than technology per se, that today threatens all life on our globe" (1990, xvii/xx).

Other writers view the changes wrought by the Scientific Revolution as key to understanding the current crises of late modernity or postmodernity. This history is well documented and there is no need to elaborate it here, other than try to elucidate its epistemological aspects. In essence, a fundamental shift in worldview took place between around 1500 and 1700 away from the relatively ordered world of medieval Christendom, to the new post-Renaissance age of (what historians later called) the

Scientific Revolution. The word ‘revolution’ is appropriate because there was an almost complete change in ontology and epistemology. While it is important to acknowledge the complexity involved in the history of paradigmatic change, which is reflected in a study by Koestler (1959), Koestler is nevertheless able to write:

> If one had to sum up the history of scientific ideas about the universe in a single sentence, one could only say that up to the seventeenth century our vision was Aristotelian, after that Newtonian.
> (1959, 497)

A series of developments in thinking and discoveries had a cumulative and synergistic effect over a period of around two centuries, undermining the old order and building the platform of ideas, beliefs, values and assumptions on which the modern age was built. The geocentric view of Ptolemy and the Bible, was displaced by the astronomy and physics of Copernicus, Galileo and later, Isaac Newton (1643-1727). Science became revisioned particularly through the work of Francis Bacon (1595-1626) in developing empiricism and inductive reasoning, and the analytic reasoning propounded by Rene Descartes (1595-1650). According to Berman, whilst Bacon never performed a single experiment, his legacy was the rethinking of science as experiment, of science as utility, and “the questioning of nature under duress” (Berman 1981, 31). Descartes made the seminal distinction between the mind - *res cognitans* ‘the thinking thing’ and matter - *res extensa* ‘the extended thing’. This separation between mind and body, subject and object, observer and observed, people and nature, ushered in the dualism and binary thinking that consequently became perhaps the most fundamental characteristic of the modern worldview. Descartes may be seen as the father of reductive thinking, of atomism, where a seemingly mechanical world was understood by mechanical reasoning, whereby problems were broken down into component parts: the whole was no more than the sum of its parts.

Whilst there was some tension between the empiricism of Bacon and the rationalism of Descartes, the two approaches complemented each other as tools in the functioning of a new emergent worldview based on separation and the primary reality of the material world. At the same time, the dominant metaphor of the world and universe changed from a theocentric organic whole where God made order, to the machine, where God was outside from the system he created, rather than seen as immanent within it.

While Newton subsequently disproved many of Descartes’ theories about the natural world, his work endorsed and validated the ‘world as machine’ metaphor. The sense of

dis-enchantment, of separation, combined with powerful new tools of investigation, that resulted from this period were essential to the great flowering of scientific enquiry that followed from the seventeenth century. And it also enabled utility, the use and control of science and nature, through the employment of instrumental rationality. Thus the scientific revolution overcame the continuity of the worldview stretching from Aristotle through Thomas Aquinas upto the medieval view that equated truth and goodness: in the Cartesian view, fact and value are unrelated.

Thus the cultural inheritance of the Scientific Revolution was an ontology which emphasised a mechanistic cosmology, which was primarily determinist, and materialist; and an epistemology that was objectivist, positivist, reductivist, and dualist. It spawned a mutually informing nexus of ideas, assumptions, and methodologies that became the expressions of the modern cultural paradigm. Social Darwinism in economic and social patterns, behaviourism in the social sciences, logical positivism in philosophy and ethics, scientism in policy debate, materialism in popular culture - all were, and largely, still are in perhaps more sophisticated forms - parts of the architecture of the modernist paradigm and the myth of progress. The mutually reinforcing nature of these aspects of the paradigm discourages awareness and questioning of the paradigm itself, because reality and norms are defined and constantly reiterated (not least by the media). Thus as Norgaard comments with respect to the promise of progress and development for all in the 20th century:

> Modernism betrayed progress by leading us into, preventing us from seeing and keeping us from addressing interwoven environmental, organisational,and cultural problems.
> (Norgaard 1994, 2)

Norgaard (1994, 63) acknowledges the underpinning beliefs of the modernist Western paradigm have been “extremely productive for both Western science and other institutions” but they are “embedded in our public discourse to the exclusion of other metaphysical and epistemological premises which are more appropriate for understanding the complexities of environmental systems and which are more supportive of cultural pluralism”.

Arguably, the essence of the modern worldview was (and still is) the perception of ‘discontinuities’ between subject/object, mind/body, people/nature and other poles. In other words, the Western mind shifted from some sense of identity with ‘the Other’ in pre 1500 worldviews to a profound sense of, as well as intellectual belief in,

separateness. Here then, seems to be the origin of what Bateson later described as our 'epistemological error'.

For Berman, modernity is a distortion which contains the seeds of its own demise. He argues that the modern epoch contained 'an inherent instability' that meant it could not last for a more than a few centuries. He argues (1981, 23) that this relates to the denial or suppression of parts of reality, and the separation of humans and nature:

> For more than 99 percent of human history, the world was enchanted and man saw himself as an integral part of it. The complete reversal of this perception in a mere four hundred years or so has destroyed the continuity of the human experience and the integrity of the human psyche. It has very nearly wrecked the planet as well.

This is echoed in the novel *The Chymical Wedding* where a character says*:*

> Materialism has freed us to do many ingenious things, but now the bill is presented. Apart from the manifold horrors we perpetrate upon ourselves, forests die, even the seas are fouled, we can no longer trust the air....By its careful inventory of the multiplicity of things it has succeeded only in creating a schizophrenic world, powerful but fissive. It should be no surprise therefore that - unless we wake up - its most characteristic achievement may soon tear the planet apart in a final clash of unreconciled opposites.
> (Clarke 1989, 173)

Or - according to Berman:

> Western life seems to be drifting toward increasing entropy, economic and technological chaos, ecological disaster, and ultimately, psychic dismemberment and disintegration.
> (Berman 1981, 15)

Whether this is 'true' or not is less an issue here, as to whether the dis-integrative qualities of our shared worldview are the main agent of our contemporary crises. Berman's ontological argument centres on loss of connection and meaning. It appears that, in a sort of double-bind, separation has rendered us less able to see the consequences of separation. The relationship with nature changed from one of co-definition, co-arising, co-evolution, to alienation. To borrow the distinction made (in 1937) by Buber, we have moved from an 'I/Thou' relation of relative dynamic harmony,

to a ‘I/It’ relation that is not only one of separation, but inevitably involves devaluation of Other.

This separation is characteristic of our external relationships with people and nature, but also our ‘internal relationships’ as evidenced in the field of psychotherapy (Laing 1965). Seen systemically, dysfunctions in our internal and external worlds are intimately related. Thus Heron (1992, 12) points to the separation of “intellect from affect” from the ancient Greeks onwards, leading to an “internal psychological abuse” which he says, leads to myriad forms of exploitation in the external world. As many writers have pointed out, separation - whether internal, or people from nature and from each other - allows domination and exploitation, through lack of any sense of identification.

According to Metzner (1995, 65) separation is reinforced through our institutions:

> Individuals feel unable to respond to the natural world appropriately, because the political, economic, and educational institutions in which we are all involved all have this dissociation built into them. Dissociative alienation has been a feature of Western culture for centuries.

Similarly, Wilber makes an important distinction between ‘differentiation’ and ‘dissociation’. As he suggests, it is one thing to *differentiate* between culture and nature, for example, but quite another to *dissociate* them: “One of the most prevalent forms of evolutionary pathology occurs when differentiation goes too far into dissociation” (Wilber 1997, 73). Yet, dissociation appears to be endemic - one might say systemically endemic - in Western society, worldview, epistemology, language and thought.

The triadic model that I have outlined in the Thesis, suggests that we can represent three dimensions of *human experience/knowing* as epistemology, ontology and methodology, mutually informed by parallel components of paradigm which I have referred to as *ethos, eidos* and *praxis.* My view is that this ‘whole systems model’ allows us to summarise and represent the ecological critique of Western culture, of Western ways of seeing/knowing/doing, as well as indicating an integrative ecological alternative.

For example, Marglin (1990, 24) reflects a common view in critical literature thus:

> The distinguishing and pathological feature of Western knowledge systems is the subordination of the personal to the impersonal.

In other words, Marglin is pointing to the imbalance between the first and second dimensions of knowing within the Western 'knowledge system' (his phrase). So the perceptual/personal/intuitive knowing dimension is undervalued (as 'subjective') and underecognised, as against the cognitive/impersonal/theoretical dimension. Similarly, Heron suggests that:

> the intellect exploits and abuses its affective base by controlling, and not acknowledging its origin in, affect; by denigrating and misrepresenting the nature of affect; by inflating its separatist power by leaching the formidable energy of affect while denying the fact.
> (Heron, 1992, 12)

Similarly, as Bawden (2000, 7) points out, by virtue of its own epistemological, ontological and axiological foundations, the dominant paradigm 'cannot be self-critical'. While this has profound costs in itself, the cultural dominance of the Western knowledge system imposes costs on other ways of knowing - often more integrative ways which bring together the three dimensions of knowing and experience. So Marglin (1990, 24) goes on to describe the exclusive character of Western scientific management, typified:

> not only by impersonality, by its insistence on logical deduction from self-evident axioms as the only basis for knowledge, but also by its emphasis on analysis, its claim that knowledge must be articulate in order to exist, its pretence to universality, its cerebral nature, its orientation to theory and empirical verification of theory, and its…hierarchical superiority *vis-à-vis* outsiders.

This said, it is important to acknowledge that Western thought is of course in a state of evolutionary change, and the current historic state appears to be one of late modernity, or postmodernity. This has been accompanied by challenge to modernist thinking both by postmodern deconstructionism and by ecological thought. The significance of such movement is that it provides evidence of reflexivity and social learning which to a degree transcends the trap of self-reference that characterises the dominant worldview.

- Key point. Both postmodern theory and much ecological thought may be seen as second-order thinking which goes beyond the first order thinking of the dominant modernist worldview.

At this point, I will look at these currents of thought in more detail.

1.5 The postmodern condition, deconstructionism and revisionary postmodernism

An increasing number of writers over recent years have held that we are moving into a postmodern society characterised by fragmentation, pluralism and individualism, and by a postmodern culture. Cultural change and associated thought is described as 'postmodernism' while the age is one of 'postmodernity'. Examination of these writers reveals much difference in intepretation and meaning attached to these terms, while some writers dispute the terms' usefulness and relevance given this lack of consensus. Others argue that we live not in a postmodern age, but one of late modernity, while also pointing to the fact that modernisation is still very much alive in the Second and Third Worlds. Thus Kumar (1997,109) suggests that, "the main drama on the world stage is still modernity, and it is destined to hold its place for as long as we can see". Others, however, see our current conditon as a state of transition. Jencks (1992, 11) gives an insightful analysis which clarifies without simplification the state of postmodernism:

> Postmodernism means the end of a single world view and, by extension, 'a war on totality', a resistance to single explanations, a respect for difference and a celebration of the regional, local and particular. Yet in its suffix 'modern', it still carries the burden of a process which is international and in some senses universal. In this sense, it has a permanent tension and is always hybrid, mixed, ambiguous, or what I have called 'doubly-coded'. Post-*Modernism* means the continuation of Modernism *and* its transcendence, a double activity that acknowledges our complex relationship to the preceding paradigm and worldview.

Jencks sees postmodernism not as a total rejection of the modern paradigm, but as a "restructuring of modernist assumptions with something larger, fuller, more true". Modernist theories are not so much overturned or abandoned as "transformed into parts of a larger framework where they still keep their identity" (1992,11). This is a critical point (first mentioned in the Preamble and A.3.1 above), and involves a loosening of the Kuhnian sense of incommensurable paradigms, in favour of evolutionary change whereby the earlier worldview is incorporated and transformed by the new.

Jencks argues against the production of bi-polar oppositional lists of characteristics with columns headed ‘ modern’ and ‘postmodern’ on the grounds that this represents the binary thinking associated with the modernist view. The postmodern view instead is associated with pattern and fuzziness, and so although Jencks finds himself necessarily drawing up two columns, he insists that it should be read as a hybridisation, a double coding: the important thing is the pattern, not the individual items.

According to *this view* of postmodernism then, it does not entail a total rejection of modernist assumptions and theories, but their incorporation, transformation and transcendence. But this view is what Griffin (1992), Spretnak (1997), and Jencks have called *revisionary* or ‘constructive’, or ‘ecological’ postmodernism, and it is important to distinguish this from the *deconstructive* postmodernism normally meant when the word ‘postmodernism’ is used.

Revisionary postmodernism seeks to transcend the modern worldview - going beyond questioning the validity of its assumptions and concepts (which is an essential aspect of the deconstructionist project) by *re-visioning* them. Yet, because deconstructive postmodernism denies the possibility of revisionary postmodernism and of an ecological worldview, it is important to examine this debate further, not least to help defend the validity claims of the Thesis as a whole. Yet I will also argue that deconstructionism is, or has been, an important if ultimately limited step in progressing paradigmatic change beyond the confines of modernism; further that revisionary postmodernism is only possible because of the contribution of the deconstructionists.

The recent birth of poststructural theory and postmodern deconstructionism is associated with French thinkers such as Foucault, Derrida, Lyotard and Baudrillard although arguably, there were antecedent currents of thought in the work of Nietzsche, Heidegger, and Wittgenstein on which the French philosophers drew. It is arguable how far this theoretical field has coherence as it includes many diverse strands in accordance with its emphasis on plurality, yet it has had a major influence on Western intellectual thought since around the mid-twentieth century. In essence, deconstructionism questions the certainties of modernism, of its associated science and philosophy and claims to universality, and its myth of progress. There is an emphasis, particularly through the work of Foucault and Derrida, on the centrality of language and text both in the construction of meaning and as the proper locus of any attempt to understand meaning and validity. Foucault pointed to power as a key

ingredient of all conceptions of knowledge and truth, introducing the dyadic term ‘power/knowledge’ (1980) to show that each is implicated in the other, and thus exposing the claims of rationalist and scientific knowledge to universal validity and neutrality, and undermining the possibility of any tenable ‘grand narrative’ - such as the Enlightenment or Marxist analysis - through what Lyotard (1984, xxiv) termed ‘incredulity towards metanarratives’. Through the work of deconstructionists we are enabled to perceive the myth of disinterested knowledge and question the modernist search for objectivist knowledge. Rather, deeper questions concerning ‘whose knowledge?’ and ‘for what purposes?’ become the central concern. Similarly, feminist epistemology has questioned the supposed value-neutrality and objectivity of mainstream epistemologies, suggesting that behind this mask lies a “complex power structure of vested interest, dominance and subjugation” (Dancy and Sosa 1993). Deconstructionism builds on the ‘language turn’ which was manifest in the social sciences in the latter half of the twentieth century, challenging the foundational certainties, objectivist epistemologies and methodologies, and particularly the materialist ontology of the positivist and empirical paradigm hitherto dominant. Essentially, the ‘language turn’ in the social sciences - the origin of which is often attributed to Wittgenstein and the ensuing schools of analytical and linguistic philosophy (Skolimowski 1981) - disputes the view of language as *representation* of an objective reality giving rise to objective knowledge, and instead stresses the role of language as *interpretation,* and moreover, its critical and unavoidable role in our *construction* of reality. The language turn then, represents a significant shift of ontology from realism towards idealism. Deconstructionism takes this constructivist argument another step. If there is no way of knowing reality behind or beyond language and discourse - if ‘all is text’ - then there can be no appeal or approximation to truth other than through deconstruction of our assumptions. Reality as text is subject to multiple interpretations and readings, and these can have no universal validity.

In sum, postmodern deconstructionists has effected a valuable and significant shift in thinking, a ‘second order’ challenge to the unexamined assumptions of modernism. From this perspective, it is clear that perception and values are inextricably bound up with knowledge-making and the use of knowledge. Further, that there is inevitably, a ‘politics of knowledge’, whereby the forms, control of, and uses of knowledge are contested as expressions of power. Hence discourse and politics, knowledge and power are ‘indissoluble’ (Apple 1991, vii), and this has been pursued through extensive work on analyses of dominant hegemonies from oppositional gender, class and race orientations. Applied to the worldview argument pursued in the Thesis,

deconstructionism helps us to both be critically aware of and analyse the assumptions, the use of language, and the forms and control of knowledge characterised within the modernist paradigm and legitimated by the powerful and by established institutions in society.

Clearly the critical discourse of deconstructionism has been liberating: it has shed scales from modernist eyes, and borrowing Hawkins' term (1991), has, at least to some degree, allowed us to see 'through' rather than 'with' the modernist perspective. Further, by undercutting the notion of one truth, it has arguably 'set us free' to explore new and alternative paths. But this new freedom comes at a price - according to deconstructionism, there can be no direction, no truth, and no grounding for action. It leaves a vacuum as regards purpose, direction and ethics. Further, as the critical realist Huckle states, "the grounds for common agreement together with the emancipatory power of social criticism and critical pedagogy are undermined" (Huckle, in press). Further, deconstructionist thought is very anthropocentric.

- Key point: Paradoxically, and from an ecological point of view, deconstructionism has taken us forward by opening up the space for an ecological worldview, but at the same time, it holds us back by denying its possibility.

The postmodern deconstructivist stance is often accused of ontological and moral relativism: because belief, truth or assertion is seen as relative to the social and cultural environment and there is no objective knowledge independent of the knower, then there cannot be any basis for evaluating between truth claims. Rorty (1999) addresses the accusation of relativism by questioning the distinction that allows the accusation to be made. As a pragmatist, he hopes to "replace the reality-appearance distinction with distinction between the more useful and the less useful" (1999, xxii). I see this as a helpful first step towards the kind of integrative thought that revisonary postmodernism seeks to articulate. Yet there are problems with Rorty's pragmatism. Not least, as Stables (another pragmatist) suggests in relation to Rorty's work, human responsibility must extend beyond the narrowly human concerns exhibited in the political and educational philosophies that have dominated modernity (2003, 9). Further, Rorty does not seem aware of the "epistemological error" argument underlying much ecological thought and indeed invokes Maturana's work on the biology of cognition to suggest that "no organism, human or non-human, is ever more or less in touch with reality than any other" (1999, xxiii) an argument that may work on the cognitive level that Maturana described, but seems to omit the affective domain altogether. An understanding of a

participative, co-evolutionary world seems absent. Rorty suggests, “the question ‘are we describing it as it really is’? is one we need never ask. All we need to know is whether some competing description might be more useful for some of our purposes” (xxvi, 1999). In relation to the environment, Rorty states, “our task is to master it, or to adapt ourselves to it, rather than to represent or correspond to it” (1999, 269). If we accept Batesons’ view that the ecological crisis is causally linked to an inadequate reading of reality, Rorty’s position seems self-limiting, even accepting that there will always be limits to our knowing.

With regard to the realism-idealism issue, I find critical realism a more convincing position than Rorty’s pragmatism, and one that in some ways brings us closer to the ecological worldview. Before continuing discussion on deconstructive and revisionary postmodernism, I will look at critical realism below.

Critical realism, a position which was first set out by R.W. Sellars in his *Critical Realism* of 1916, rejects naive realism (which suggests our perception of the material world to be immediate or direct) and also, according to Flew (1979) is the historical successor to idealism. As Parker (2001, 91) states, “critical realism asserts the reality of structures in the world but the *critical* dimension recognises that all structures can only be known under some socially mediated and hence historically contingent form of description”. Therefore, in common with the ecological, participatory worldview, it maintains the ontological assumption of a material world, but acknowledges that this can only be known through the mediation of perception, language and thought. Further, criticial realism echoes systemic thought as, according to Parker, it opposes reductive materialism in recognising emergence and complexity and can “facilitate a holism that can still welcome analysis” (2001, 105). Huckle and Martin suggest that critical realism represents an approach to knowledge that lies between modernity and postmodernity, in upholding that there can still be criteria for deciding what is true or right, that there can still be general theories whilst accepting plurality, and that a “realistic utopianism” is still worth upholding (2001, 39). To this extent, there is clearly much common ground between critical realism and the postmodern ecological worldview. The differences lie elsewhere. Critical realism appears an essentially rationalist philosophy, whereas ecological thought attempts to weave a broader integrative framework which attempts to go beyond the limits of rationalism and dualism. Critical realism may illuminate some of the ground leading towards a fully developed ecological framework, but does not itself constitute alternative paradigm to the mainstream.

Yet the postmodern turn leaves a hiatus which urgently requires such an alternative. As Reason and Bradbury (2001, 6) point out, “while postmodern / poststructuralist perspectives help us immensely in seeing through the myth of the modernist world, they do not help us move beyond the problems it has created”. At this time of planetary crisis, there is no constructive alternative offered or indeed, possible. According to Griffin, a major writer on revisionary thought, (1992, ii), deconstructionism seeks to overcome the modern worldview through an ‘anti-worldview’ which:

> Deconstructs or eliminates the ingredients necessary for a worldview, such as God, self, purpose, meaning, a real world and truth as correspondence

The problem, according to Spretnak is that deconstructionism is not as *post* modern as it believes itself to be. According to Griffin (1992), it can be seen as ‘ultramodernism’ because it carries modern premises to their logical conclusions. It is popular with intellectuals and academics, Spretnak says (1997, 66) because:

> It stays comfortably within the essential parameters of the modern worldview by failing to challenge the core discontinuities imposed, or intensified by that worldview: between humans and nature, body and mind, and the self and the rest of the world.

She suggests that deconstructionists have been educated in the “scientistic-humanist worldview” and are therefore still influenced by its assumptions. If we were alienated from the world and each other by Cartesian dualism, then we are even more adrift in the relativist sea that deconstructionism presents. Reason and Bradbury are concerned that, at a time of ecological crisis, deconstructionism does not help us in the area of ‘knowledge in action’: they suggest that it may make worse rather than heal the modern crisis of rootlessness and meaninglessness (2001, 6). We are left rudderless with what Spretnak terms the “ideology of denial” (1997, 69).Yet deconstructionist ideas have had wide influence. Spretnak suggests that even people who would not identify with this label, nevertheless hold that:

> Human interaction with nature is a one-way projection, and that beliefs and values are merely relative and have no validity other than their own invention. (1997, 69)

The problem is not with the useful and perfectly valid idea that conceptualisations are culturally constructed, says Spretnak (1991, 5), but with the leap that is then taken that there is “*nothing but* cultural construction in human experience”(her italics). This is a

key point. Spretnak's case, outlined in her *Resurgence of the Real* (1997), is that deconstructionism ignores the common human experience of "the Real" being, *body, nature* and *place.* (She illustrates this by recounting a discussion with a young 'deconstructionist' about whether all life needed water irrespective of what discourse about water might be invented (1991)). The problem is, she says, deconstructionism does not accord with everyday human experience of 'the real'.

Reason and Bradbury echo a further common criticism of deconstructionism – that for all its critique of metanarratives, it too - inevitably - reflects a worldview, and one based on the metaphor of 'world as text'. Instead, they argue - as I also do here - that what is needed instead is a metaphor that respects the truth of cultural construction but also the truth of "deeper structures of reality" and suggest that a "creative and constructive worldview can be based on the metaphor of participation" (2001, 6).

Wilber's criticism of deconstructionism adds another dimension, and turns on the systemic idea of holons. (This key idea is explicated below in B.1.6.) While, Wilber says, deconstructionists are foes of any systematic theory or 'grand narrative' and therefore might be expected to object to a theory of holons, their own work is:

> …driven precisely by a conception of holons within holons within holons, of texts within texts within texts, (or contexts within contexts within contexts) and it is this sliding play of texts within texts that forms the 'foundationless' platform from which they launch their attacks.
> (Wilber 1997, 100)

Wilber agrees with the deconstructionists (1997, 102) that "meaning is context bound, but context is boundless", but goes on to state that this does *not* mean there is no meaning anywhere (his italics):

> That the system is sliding does not mean that meaning can't be established, that truth doesn't exist, or that contexts won't hold still long enough to make a simple point.

Wilber turns the deconstructionists' position on its head (he uses the analogy of a photographic negative), saying that reality consists not of "nested deceptions" but "nested truths".

Does this mean the revisionary movement contradicts Lyotard's premise of deconstructive postmodernism, that there can be no 'grand narrative', no total

explanation? The emerging 'ecological paradigm' appears to be an alternative and oppositional view which in some ways makes big claims, yet it also carries with it a large measure of uncertainty, of questioning and searching, not least as it is still in the making. Thus, Spretnak (1997, 223) refers to it in the future, rather than the present tense:

> A truly postmodern alternative would counter the modern ideological flight from body, nature, and place. It would be a grounded, deeply ecological, and spiritual postmodernism.

Flood adds that systemic thinking, which I argue here is intrinsic in some form to revisionary postmodernism, takes issue with grand narratives, because it accepts that we will always have a restricted understanding of what is going on around us (1999, 2). From ecological point of view, the critical struggle is to surmount and transcend both modernism *and* deconstructive postmodernism, through the emergence of a postmodern ecological paradigm, that recognises the achievements and limits of both. As noted in A.2.3 above, the not infrequent representation and perception of the ecological paradigm as the simple antithesis of the modern paradigm, or of deconstructionism, is a dualistic oversimplification. Whilst useful and easily understood, it gives the false impression that the 'new' is appearing in some conceptual vacuum, and that it is in some sense complete by virtue of being the antithesis of the 'old', rather than emerging from the old as a 'messy' cultural and historic process. By contrast, my understanding is that emerging postmodern ecological paradigm is:

- partly *reaffirmative* (of earlier alternative ideas and philosophies both in ancient and modern times).
- partly *oppositional* and critical (where modernist or deconstructionist ideas appear destructive, dangerous, or 'wrong'),
- partly *hybridising* or transforming (where modernist or deconstructionist ideas are still useful or appropriate but inadequate),
- partly *alternative*, (where modernist or deconstructionist ideas are no longer appropriate)
- partly *innovative* (where modernist or deconstructionist ideas have little or nothing to say).

In terms of the realist/idealist schism and debate, the ecological worldview acknowledges and brings both positions into relationship, a third position I call *relationalism*. Here again, we can invoke the model of learning levels to make an

important point. I am suggesting that this relationalism equates to third order learning and change, which builds from and acknowledges the 'first moment' of positivism and realism as first order thinking, and the 'second moment' of constructivism and idealism as second order thinking. The importance of this point is that second order argument alone, whether expressed in deconstructionism or second order systems thinking, has an inherent danger of underplaying material reality, as a reaction to objectivism and positivism. The flaw in this position - as important as it is in emphasising our inevitably constructive epistemology - is that can allow environmental degradation and associated crises to worsen by default, through failing to recognise our fundamental embeddness in the wider ecology.

- Keypoint: Taking the 'whole sytems' inclusive logic of the learning levels model, *there can be no second order thinking without a first order reality, and indeed, no third order thinking without second order thinking.*

Wilbers' view on the development of worldviews is insightful here (1996, 67):

> As the higher stages in consciousness emerge and develop, they themselves include the basic components of the earlier worldview, then add their own new and more differentiated perceptions. They transcend and include. Because they are more inclusive, they are more adequate.
>
> So it's not that the earlier worldview is totally wrong and the new worldview is totally right. The old one was adequate, the new one is more adequate.

This persuasive idea is also echoed by Tarnas (1991, 438) who says "we can see why the same paradigm…is perceived as a liberation at one time and then a constriction, a prison, at another". But there is a further dimension here too, which Wilber's insight does not fully capture either, and that is the tension throughout the period of modern history between organicist and non-organicist traditions within Western culture and also between Western and non-Western cultures. At the end of his extensive review of 'the ideas that have shaped our worldview' from the Greeks onwards, Tarnas notes (1991, 433) that the organicist alternative tradition, founded upon "the fundamental conviction that the relation of the human mind to the world was ultimately not dualistic but participatory". This he suggests, did not "oppose the Kantian epistemology but rather went beyond it, subsuming it in a larger and subtler understanding of human knowledge". This organicist tradition is reviewed further in **Appendix I**, section 1.3. Ultimately, ecological thinking does no more than claim to be 'more adequate' and is

more interested in integrating partial truths rather than picking one and ‘disproving’ others - an integrative methodology which (as noted above) Wilber claims to follow in his writing.

The postmodern ecological worldview, does not offer a final ‘grand narrative’ but an emerging nexus of thinking across a number of fields including natural sciences, psychology, ethics and philosophy. It stresses such ideas as the participative universe and ‘participative consciousness’ which throw deeply into question ideas of the knowable and determinist world, and yet which affirm the reality of a given and more-than-human but ever-changing and creative cosmos.

In a paper on the ecological worldview, Cobb notes that the materialist-mechanistic worldview has always been accompanied by oppositional, alternative and counter movements. He cites the Romantic movement, vitalism in biology, existentialists and counterculturalists, and occultism. Yet he suggests these ‘reactions’ functioned chiefly ‘negatively’ and were “accepting the modern worldview for the most part”. By contrast Cobb suggests, ecological thinking is qualitatively different. “It is not a mistake” he says, “to single out the ecological movement as of particular importance in helping break the hold of the modern worldview on scientific thinking and common sense” as it has “the essential ingredients for a postmodern worldview” (Cobb 1988, 104).

Postmodernism - of both kinds - has partly arisen from a growing critique of modernist assumptions, but revisionary postmodernism has emerged from a realisation of the inadequacy of deconstructionism in accounting for or addressing increasingly evident social, environmental, and economic, and spiritual problems. Thus, dis-illusion with, or *from*, modernist assumptions and deconstructionist ideas has arisen partly from the recognition of connectivity - of links and patterns between seemingly disparate and disassociated issues and phenomena. It has also arisen from an awareness that we live in paradoxical times: despite the pluralistic ideas of postmodernism, economic and cultural globalisation is leading to ‘global homogenisation with local fragmentation’ rather than ‘global diversity with local cultural coherence’, and that this unsustainable dynamic requires an intellectual as well as a practical response.

In the next section, I begin to look more closely at the nature of the ecological worldview that is at the heart of revisionary postmodernism. It is difficult to capture the essence of something that is ‘in the air’ - an ecological *zeitgeist* - and attempts to do so probably reduce the complexity and richness of what it is or may be. This follows

because it is emergent or arising, and may not be adequately understood until seen from a retrospective viewpoint much later in the century. However, it is possible to map out some of the ground.

1.6 The postmodern ecological worldview - looking at essential ideas

In this subsection I attempt to lay out some of the key ideas and perspectives which, taken together, weave a 'theory of relationship' which underpins the postmodern ecological worldview. In **Appendix I**, some of the intellectual and philosophic foundations which support these ideas are elaborated.

Recognising the Other

According to Berman (1981, 23) we neither can - nor probably would we want to - return to the organicist views of alchemy or animism, but nor do we have to follow the logical outcome of increasing separation and engineering offered by the technocentric and technocratic worldview. There is then, a need to articulate more deeply and clearly, the nature of the ecological worldview which promises a constructive alternative to these directions, whilst acknowledging the simultaneous impulses that - the Western psyche at least - appears to experiencing, of both separateness *and* belonging, both division *and* unity (Colegrave 1979). As I have noted, *relationship* is key here. Buber's model of the 'I-Thou' relationship is one useful way of articulating this essence.

By contrast with the prevailing 'I-It' relation of objectification, the ecological paradigm emphasises an I-Thou relationship, where reality for both is seen as a co-creation of both. Heron comments, "reality, presentness, wholeness exist only in so far as this relation of meeting exists - (Buber) thus stresses *the primacy of relation for attuning to the real*" (Heron 1992, 35, my italics). Similarly, the noted ecophilospher Arne Naess (1995) expounds the notion of 'the ecological self', which involves a broadening and deepening of the self, or self-realisation through identification. (Naess' lecture was given in 1986.) This emphasis on relation, and the *quality* of relation, is at the heart of new paradigm thinking - and is reflected in calls for an education which acknowledges, reflects and gives primacy to the importance of relation (Orr 1992, Smith 1992). This what Laura and Cotton (1999) term 'empathetic education', Eisler (2000) calls 'partnership education', and what I have called 'sustainable education' (Sterling 2001).

I-Thou is a third way, a median way between alienation on the one extreme and union on the other. The dominant relational mode, I-It, is one of separation and alienation, both from each other and from the environment. In extreme, it is *non*relational. This

dualistic separation is reflected even in the structure of the English language, which separates subject and object. In contrast, union means complete identification with the Other, so that consciousness of separate self no longer exists. This is no longer I-Thou, but One, and is exemplified by the 'peak experience' that some people have, or by the extreme identification with prey practised by some indigenous hunters, and by Buddhist philosophy which sees self as ultimately illusory. Heron argues against the Buddhist perspective, saying there is a difference between 'distinctness of being', which he upholds, and an egotistical 'separateness of being' which Buddhism seeks to dissolve.

Heron then, views reality as the One and the Many, the many being differentiated but not separate. This view is increasingly echoed by holistic science, which notes the dynamic connection at physical and non-physical levels between differentiated systems. For example, Macy (both a systems and Buddhist scholar) (1995, 254) talks of life forms as 'patterns' in the flow of energy, matter and information:

> Sustained by these currents, open systems evolve in complexity and responsiveness to their environment. Interacting, they weave relationships that shape the environment itself. Every system, be it a cell, a tree, or a mind, is like a transformer, changing the very stuff that flows through it. Flows of matter and energy create physical bodies, flows of information make minds. Both kinds of flow generate interdependencies weaving each into the larger ecology, the web of life.

Interestingly, Macy appears not to be recognising interrelation between mind and matter, and it may be too simplistic to suppose that ‘just’ flows of information make minds (see “Panexperientialism’ heading below). This reveals, to some extent, a problem with language and our thinking (or language/thinking for these are also intimately connected) which tend as we have seen to reify dissociation. Let's take an important phrase from Briggs and Peat’s (1985) book on holistic science (which otherwise echoes Macy's point). Quoting Bohm’s views on the ‘mind-body’ problem, and the ‘observer and the observed’ relationship, Briggs and Peat (1985, 138) state they ,*“are neither separate, nor the same”*. This statement ‘jumped from the page’ when I first read it. It is a perception that defies logocentric, that is, binary 'either/or' logic - which insists that things are *either* separate, *or* the same, and thereby interferes with understanding dynamic relation. Kidner, similarly, invokes the idea of ‘resonance’ which “respects and recognises the structure of the other”, and he suggests that ‘resonance’ is “an alternative way of envisioning our superficially paradoxical separateness-from and relatedness-to nature” (Kidner 2001, 294, 295). To understand

that organisms, or for that matter people and nature, are 'neither separate nor the same', takes a *gestalt* switch of thinking to appreciate - as opposed to reductive thought which finds it difficult to accommodate. The following tale is illustrative here.

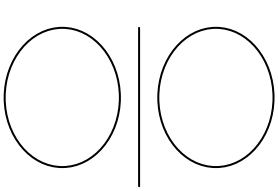
Box B.2: 'Not One, Not Two'
This illustration comes from De Mello's 'One Minute Wisdom' (Dych 1999, 73)

'How does one seek union with God?'
'The harder you seek, the more distance you create between Him and you.'
'So what does one do about the distance?'
'Understand it isn't there.'
'Does that mean that God and I are one?'
'Not one. Not two.'
'How is that possible?'
'The sun and its light, the ocean and the wave, the singer and his song – not one. Not two.'

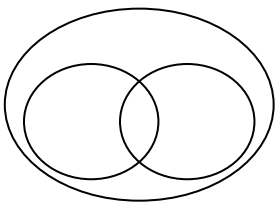
Systems thinking can sometimes facilitate such a gestalt switch, from separation to interrelation and recursion - and this in itself can be a 'paradigm change', a re-cognition. As Meadows suggests (1997, 84), sometimes, "all it takes is click in the mind, a new way of seeing".

The following diagram is a representation of the difference between 'I-It' and 'I-Thou' perceptions of relation.

Diagram B.2: Representing 'I-It' and 'I-Thou' relationships



I-It : decontextual separation



I-Thou: co-creation in context

Thus, I-Thou is much more than *valuing* the Other, the case for which has been the stuff of environmental ethicist's efforts for some years. While valuing is very important, arguments for say, environmental protection, tend to turn on axiological argument

which rather ignore the qualitative dynamics of relation. Ethics of value tend to turn on notions of duty, of 'ought' - a dualistic view - rather than arising from awareness of co-creation or co-evolution. Something of the deeper quality of I-Thou is reflected in Illich's observations which suggest that the Other is always more than we bring to it.

> The I-Thou relationship is always surprising because that which is real, strong, beautiful and good in my discovery of you is not what I could foresee.
> (Illich 1995, 15)

Illich suggests that by seeing more, we in turn are enriched by the Other. To no small degree we are constituted and defined by experience of the Other, in mutually participative, co-creative, interpenetrating relation. As Gibson (1979, 25) has said, "To perceive the world is to co-perceive oneself". Even the words 'I-Thou' then may imply a static distinction which is not really tenable. (These ideas are taken further in **Appendix I** section 3.1 below, on perception.)

From a systems view, an assertion of I-Thou relationship and the total system that the relationship forms, requires a form of thinking that recognises, affirms, and works with this mutuality. It suggests a more whole sensibility, and therefore the additional employment of 'other ways of knowing'. It implies the rediscovery and cultivation of what Bateson called 'analogue' knowledge which includes all affective communication and perception such as art, fantasy, body language, rather than only 'digital' knowledge which is verbal-rational and abstract (Berman, 1981, 341). In contrast, the prevalent I-It relation is almost inevitably one of domination, based on a belief in separateness: I win because you lose, you lose because I win. The alternative, according to Bateson and Bateson (in the last book that Gregory Bateson would write, with his daughter) requires:

> a shift of our ways of seeing that would affirm the complexities and mutual integration of *both* sides of any interface.....What will it take to react to interfaces in more complex ways? At the very least, it requires ways of seeing that affirm our own complexity and the systemic complexity of the other and that propose the possibility that they might together constitute an inclusive system...
> (Bateson and Bateson 1988, 176)

It is this inclusive thinking that lies in at the root of appeals, for example, for what are termed 'win-win' strategies, designs and scenarios (for example, as advocated by radical ecological economist Hazel Henderson 1996), and in the emerging field of ecological design. Further, it is at the heart of ecological ethics and a moral sense

which lies “in a deep appreciation of, and profound respect for, one’s relations with others” (Bawden 2002a, 10).

From ‘holism’ to ‘Holism’

The 'bothness' of this view, is I believe an essential characteristic of systemic and ecological thinking, and a step towards systemic wisdom. However, it is frequently misconstrued. The ancient Chinese Taoist philosophy of yin-yang polar principles (Colegrave 1979), which I take to be entirely consistent with the Batesons’ view above, is illustrative here. A strong and vital part of the ecological worldview movement seeks to assert the suppressed or oppressed 'Other' whether it is women, nature, spirituality or other manifestation of 'softer' values. Those opposing the self-assertive excesses of a 'yang' culture, stress the need for 'yin' integrative tendencies to restore balance (Capra 1996). For example, ecofeminists assert feminine values and intuition in the face of patriarchy and rationalism. Deep ecologists assert nature in the face of domination by mankind. New Agers tend to assert the spirit and consciousness in the face of a strongly material consumerist culture. In yin-yang terms, the reassertion of soft 'yin' values to balance hard dominant 'yang' values appears strongly necessary. But, at the same time, those who assert yin qualities by seeking to *deny* or *suppress* yang qualities altogether tend to fall into the trap of advocating an alternative one-sidedness, albeit perhaps a preferable dualistic imbalance to the present one. In trying to assert a worldview - even a systemic one - that transcends the old, there is a danger noted by Wilber (1996, 67), it “might not just transcend and include, it might transcend and repress, exclude, alienate, dissociate”. In other words, the old dualistic see-saw of competing or negating opposites remains, even if the balance has changed.

The same problem arises in discussion of holism, when attention to 'the whole' can mean devaluation of 'the part' (for example concern to protect ecosystems rather than individual organisms), rather than seeing 'parts' as 'wholes within wholes'. The trap here is one of ‘reductionistic holism’. Arguably, the 'true holists' are those who recognise the need for reassertion of yin qualities within the interplay of a large number of presently distorted polarities, but also recognise that ultimately harmony lies in their co-definitional and recursive relation. This distinction, between what might be called 'holism' (re-assertion of 'soft' poles) and 'Holism' (integration and balance of polarities), perhaps clarifies some of the tensions within the new paradigm. Such Holism is not a dissolution of duality into a homogenous monism, but what Heron (1992, 186) has usefully called a 'dipolar unity' or 'non-separatist dualism', a duality as opposed to the separatist dualism of Cartesian thought. Or, as Watts (1975, 26) (a prolific interpreter of

Eastern philosophy) notes, “the yin-yang principle is not what we would ordinarily call a dualism, but rather an explicit duality expressing an implicit unity”. This is a dialectic which encourages us to “continuously re-connect dismembered dualisms” (Ison and Russell 2000, 25) - a shift (in Diagram B.2 above) from the I-It figure to the I-Thou figure.

In practical terms, it is not a matter of looking either for consensus, “or trade-offs between apparently politicised positions, but an analysis of the patterns that emerge when the reasons for the distinctions between them are explored as if they were different faces of the same reality” (Bawden, 1991, 2366). This is a profoundly different approach, and (though I don’t particularly like the term), different ‘mindset’ than is the norm. Mechanism proceeds from an assumption of fragmentation and dissociation (to use Wilber’s term); ecological systemisism proceeds from an assumption of essential unity and connectivity.

- Keypoint: The former position gives rise to the deep-seated belief that the wellbeing of the isolated part is won in struggle against other parts: the latter position gives rise to the conviction that the well being of the part depends on the wellbeing of the whole, and vice-versa.

The above discussion, reflected in Chinese model of interplay between yin-yang forces, is also echoed in the important systems notion of interplay between towards autonomic and integrative tendencies. This, I believe, is a further essential concept at the heart of ecological thinking. But while a number of writers make reference to this dynamic (Capra 1982, Heron 1992) it is rarely developed. In my view, this apparently simple model affords great potential insight into system behaviour, social relations, 'environmental problems', ecodesign, sustainability, and also, importantly, affords a sense of 'transpersonal' ethics. It is perhaps also a keystone concept of systemic thinking.

Autonomy and integration

The idea of the autonomy/integration dynamic, arose from the development of holistic thinking, and particularly Koestler’s proposition regarding the ‘holon’. Koestler coined the term ‘holon’ (1989) following on from Jan Smuts (1926) original work on holism (although Koestler's book - first published in 1967 - does not acknowledge Smuts). The 'Holism' which I have described above, which transcends the 'reductionism'/'holism' divide and debate, might better be called 'holonism' though I am not aware that this

term has been used elsewhere. In inventing the neologism 'holon', Koestler comments (1989, 49) “it is worth the risk, because it fills a genuine need.”

The need is communicating a sense of 'bothness' rather than 'either/or' to our sense of parts and wholes. The latter sense is what Koestler calls the “two-term part-whole paradigm which is deeply engrained in our unconscious habits of thought”. As Koestler correctly states, “parts and wholes in an absolute sense do not exist in the domain of life” (341) - reminding us perhaps, that words themselves are limited conceptual models, and that identifcation of ‘a system’ depends on the identifier. Thus, Feibleman, in his 1954 paper on a ‘theory of integrative levels’, notes that the question of ‘which are parts’ and ‘which are wholes’ depends on the level looked at by the observer “for there is some level at which every organisation is a part of some whole and another level at which it is a whole to its parts” (Feibleman 1954, 59).

Koestler suggests the concept of holon “to reconcile the atomistic and holistic approaches”. The holonic model suggests that all biological and social systems exhibit both self-assertive and integrative tendencies. This applies to all living systems - organisms, ecosystems, and social systems. But, according to Wilber (1996) it can also apply to symbols, ideas and parts of language. Koestler (1989, 56) explains the dynamic thus:

> the self-assertive tendency is the dynamic expression of the holon's wholeness, the integrative tendency, the dynamic expression of its partness.
> (Koestler 1989, 56)

In healthy systems, states Capra (1982, 27), whether an individual, a society, or an ecosystem, “there is balance between integration and self-assertion. This balance is not static but consists of a dynamic interplay between the complementary tendencies, which makes the whole system flexible and open to change”. Similarly, Heron (1992, 15) - referring to persons - talks of the basic polarity between individuating and participatory tendencies.

While the balance between these tendencies is always in a state of flux, as in the yin-yang model, disorder arises when the subsystem is able to exert *too much* autonomy, meaning that the meta-system is disturbed, or when the meta-system exerts *too much* integration on the sub-system, meaning that the homeostasis and identity of the subsystem is impaired or diminished. (This becomes clearer when one thinks of a family, or classroom, or organisation.) Thus the health, nature, and state of being of

any system then is partly the product of the dynamic balance between these tendencies at all levels (subsystems and metasystems) of the system.

It is important to state that systems appear to nest hierarchically. Koestler invented the alternative term 'holarchy' to describe the relation of holons. As Wilber (1996, 28) says, this is:

> simply an order of increasing wholeness, such as: particles to atoms to cells to organisms, or letters to words to sentences to paragraphs. The whole of one level becomes a part of the whole of the next.

Thus, holarchy is a way of describing what appears to be the fundamental pattern of relation. But a confusion arises when people muddle what Wilber terms 'normal hierarchy' with 'pathological or dominator hierarchy'. He argues that some ecofeminists and ecophilosophers, who see themselves as representative of new paradigm thinking, are mistaken when they identify *all* notion of hierarchy and order with the 'old paradigm' or patriarchal worldview. For example, Kirkpatrick Sale, who is one of the leaders of the bioregional movement, in a bipolar diagram comparing the 'industrial scientific paradigm' with the 'bioregional paradigm' puts 'hierarchy' in the first column, and 'complementarity' in the second (Sale 1991, 50). Similarly, Capra dislikes the use of the word ‘hierarchy’ in connection with biological systems stating that hierarchy “…is a human projection. In nature, there is no ‘above’, nor ‘below’, and there are no hierarchies. There are only networks nestling within other networks” (1996, 35) (as if, I would suggest, ‘network’ is not another human projection). Others prefer use of the term ‘heterarchy’.

Wilber suggests such labels avoid the ‘reality’ of holarchy - rather he says, we need to “tease apart *normal* holarchies from *pathological* or *dominator* holarchies” (1996, 29). While Capra is right to remind us that any model is just that - a model - the idea of holarchy permits the articulation of a generic pattern that seems to apply to both human and non-human aspects of reality. For example, Wilber gives some extreme examples of pathological holarchies, including a cancerous cell invading the body, a fascist dictator dominating the social system, or a repressive ego dominating the organism. For Koestler, too much self-assertion in a holon (in the social sphere) leads to aggressiveness “whether the holon is an individual, or a social class, or a whole nation” (1989, 57). On the other hand, too much integration leads to overdependence at a ‘lower’ level on ‘higher’ holonic levels and loss of autonomy and identity at the lower

level. Here, an example might be the decline of local economies and local economic cycles as economic globalisation proceeds.

Wilber (1996, 29) suggests that pathological or dominator holarchies result when holons “want to be only a whole, and not also a part”. Degeneration of 'normal' holarchies to 'dominator holarchies' leads to “illness, pathology, disease - whether physical, emotional, social, cultural, or spiritual”. Given this model, there is a pattern of dysfunction that can be discerned in dominator holarchies, most notably perhaps - in relation to sustainability - the failure of the human economic system to fit within the larger biospheric metasystem (Meadows 1992, Daly 1996, Brown 2001). According to Wilber (1996, 30), we need to attack these dysfunctional patterns, not to get rid of hierarchies, but to “allow the normal or natural hierarchy to emerge in its place and continue its healthy growth and development”. So for me, the notions of holon and holarchy allow us to think about ‘systems health’ and sustainability.

- Keypoint: the ideas of balance between autonomic and integrative tendencies in systems allow us to consider the conditions that encourage healthy holarchies.

Whole system models

The ideas of balance between autonomy and integration are not enough in themselves to help us appreciate and maintain healthy relationships and holarchies. What is also needed are whole systems models which allow some understanding of the relationship between holonic levels. According to Wilber (1996, 72), most of the ‘maps’ of reality that have been offered from ancient to modern times are holarchic “for the simple reason that holarchies and holons are impossible to avoid”. Wilber offers his own ‘four quadrants’ model which attempts to map what he sees as the four essential and interrelated holarchies of the world, being the intentional, behavioural, social and cultural (his terms). These can be restated as the perceptional, material/objective/individual, social organisation, and collective worldview aspects or systems. Whilst I find Wilber’s model very rich, it is almost too overarching to make it usable or easily comprehensible. On these criteria, I prefer Daly’s ‘means-ends spectrum’ first published in 1977, or Wilden’s similar ‘dependent hierarchy of nature-culture relations’ model (1990) (I am grateful to Paul Maiteny for bringing this to my attention.)

Daly’s model maps a ‘total ecology’ including physical and non-physical aspects. It situates the human economy within a hierarchy/holarchy resting on a basis of nature or

natural resources, seen as '*ultimate means'*, and reaching to the top which is the location of '*ultimate ends'*. Daly's model may be found in the **Appendix II** Part B.1.6, labelled Diagram B.3. The ultimate means is *natural capital*, "on which all life and all economic transactions are built and sustained…(including)…the matter of the planet, the sun's energy, the biogeochemical cycles, the ecosystems and the genetic information they bear and the human being as an organism" (Meadows 1999b, 367). Technology transforms these materials to '*intermediate means'* which are *built capital, human capital* and raw material, which are valued, distributed, maintained through the political economy. These are the means by which governments and economies can deliver '*intermediate ends*' - goods, health, wealth, education, transport, communications etc. Everybody wants these things but they are not sufficient in themselves, as there is a higher level, that of 'ultimate ends' relating to well-being, fulfilment, peace, identity, individuation and so on (in this regard, Daly's model echoes Maslow's hierarchy of needs). Whilst the model has weaknesses (Meadow's chapter discusses anthropocentrism, and the difficulty of being clear about 'ultimate ends'), it nevertheless is a powerful whole system representation which inspires some key insights. Not least it affords a much fuller picture than a good deal of environmentalism which tends to focus on the bottom part of the spectrum.

For Clark, (commenting on Daly's model), by concentrating on the central regions of the entire spectrum of human concerns, "the Western worldview endangers both the environment, the ultimate means that supports and nurtures us, and our own spiritual need for meaning, the ultimate end of conscious existence" (1989, 326). For Meadows (1999, 368), the significance of the model is that it shows that the realisation of human ends depends on "healthy, functioning natural and economic and social systems" in other words, systems health at any level depends on systems health at sub- and supra-system levels.

The important point then, is the relationship between the nesting levels. As Feibleman (1954, 59) says, in such a relationship, "the higher level depends upon its continuance upon the lower levels", and this bears out as a general rule in systems thinking. Wilden's model, which echoes Daly's, makes a similar point: society and economy depend on nature and cannot survive its extinction. But if society and economy extinguish themselves then nature will continue. This of course, is one of the critical implications of Lovelock's Gaia theory. At the other end of the Daly's spectrum, if we make ourselves extinct, we substantially weaken if not destroy Teilhard de Chardin's 'noosphere' and in some sense, perhaps slow up evolution. Ecological or whole

systems thinking then, encompasses and is concerned with the 'ecology' of the whole system represented by Daly's model.

These powerful ideas of holonic and systemic relation suggest a dynamic and organismic order against which notions of pathological hierarchic order, domination and dependency (based on mechanistic, dualistic and social Darwinist ideas), appear simplistic, unjust and dysfunctional. In my view, these holonic ideas are deeply radical, empowering and liberating, but not in any absolute or prescriptive sense. The ideas of healthy holarchy are, of course, no more than another model, but my argument is that they comprise an insightul way of seeing the world, and help us us construct a more fully developed ecological paradigm.

Co-evolution

Another complementary part of the conceptual framework of the ecological worldview is the theory of *co-evolution,* an idea developed by Jantsch drawing on Prigogine's dissipative structures theory and von Bertalanffy's systems theory. It was popularised by Brand (a student of Bateson's) in his *CoEvolution Quarterly,* and notably developed as a theory by Norgaard (1994). According to Darwinian theory, the organism and its environment are fundamentally separate entities, and the organism adapts to changes in its environment, especially through the mechanisms of its genetic makeup and of natural selection. In the co-evolutionary view, organisms and their environment affect each other and change together in systemic relationship. According to Harman (1994, 385), organisms as complex adaptive systems "both make and are made by the environment and are thus actors in their own evolutionary history". Lovelock's Gaia theory has been particularly influential in expressing and advancing co-evolutionary theory.

Co-evolutionary thinking underlines the notion of the world as a systemic, participatory place and refutes separateness and simple causality. Briggs and Peat (1985, 207) note that the co-evolutionary view makes no distinction between micro and macro-evolution: "They cause each other simultaneously. In effect there are no levels at all", while later they state, "Co-evolution is a description of holistic unfolding, not an interaction of separate parts". If we see things from such whole systems perspectives, as Bateson hoped, then in a real sense there is no 'outside intervention', *but a change in the whole in which we are a part*. As Jackson (1991,152) notes:

> The dialectical or ecological approach acknowledges that our every act is involved in creating the world. It is inescapable for us to operate in our daily lives and not create the world that everyone must live in.

This raises the important issue of how far the concept of 'the environment' is valid. Whilst it may be useful in an everyday context, it reinforces the dualistic notion of people-environment; of our essential separateness.

- Keypoint: a simple environmentalism perpetuates the idea of an external, manageable and controllable 'thing' rather, whilst the postmodern ecological worldview subscribes to a more process-based, co-evolutionary ontology whereby we are embedded in a wider ecology.

This is an important difference of view which I discuss further in **Appendix I** (subsection 1.3), while co-evolution is discussed in relation to complexity theory in Appendix I (subsection 1.4)**.**

There is an important corollary here, and that is the shift from certainty and determinism that ecological thinking suggests. Conventional mechanistic science believed that in principle everything was knowable, and predictable; a stance which reflected a belief in a kind of omniscience and prescience, and resulting in a universalism in approaches to and the use of knowledge. Holistic science and systems thinking tells us something quite different: that not only do we know little, but there are limits to what we can know, particularly as regards prediction. This brings us back to the argument that we have to replace the illusion of absolute knowledge and control with the possibility of what Flood (1999) calls knowing and "learning within the unknowable" - and the reality of participative knowing.

Panexperientialism

Closely associated with the theory of co-evolution is panexperientialism (or 'panpsychism'), the ontological position that matter and consciousness are not separate, as Cartesian dualism suggests, but profoundly complementary and co-arising. This view, which echoes pre-modern animistic views of nature, is notably associated in modern times with the process philosophy of AN Whitehead and CH Waddington, and was further developed by Bateson in his extensive work on an ecology of mind (1972, 1980). The panexperientialist position addresses the Cartesian mind-body problem that has dogged Western philosophy and thinking into the present. Thus, Griffin suggests that the difference between the ontological positions of materialism and dualism is more apparent than real inasmuch as materialism accepts

the Cartesian dualistic analysis of the meaning of ‘physical’ and ‘mental’ (1998, 77). Further, almost all authors, says Griffin, write as if materialism and dualism are the only realistic options, and therefore perpetuate the problem (1998, 79). Through panexperientialism, we attribute “the two basic features that we associate with mind - experience and spontaniety - to all units of nature” (Griffin, 1998, 78). This philosophical position has been endorsed by cognitive science, and particularly by Maturana and Varela’s theory of cognition (1987). According to this theory, mind or more accurately mental activity is immanent in matter at all levels of life, whether or not a brain or nervous system is present (Capra 2003, 30). Mind and matter should not be seen as separate things as in Cartesianism, but as “complementary aspects of the phenomenon of life - process and structure” (Capra 2003, 33). This ‘biology of cognition’ has endorsed Bateson’s view that mind is immanent in nature, and in so doing, helps address the issue of the ‘epistemological error’ that he identified. In other words, panexperiential ontology - underpinned by cognitive science - gives grounding for the relational, participative, ecological epistemology that Bateson believed necessary.

Further, this view affords a sense of the numinous and sacred, where ‘man is not the measure of all things’, but part of a greater ineffable whole. It supports an empathetic and transpersonal ethical sensibility, and a sense of compassion.

A summary - thinking and knowing differently

These key ideas imply a necessary shift of consciousness. Put simply, it is from one whereby:

- we believe that in principle everything can be known (and therefore controlled)
- we think we know - through observation and measurement
- we don’t know that we ‘don’t know’

to one whereby:

- we know that everything can’t be known (and therefore ‘appreciation’ is vital)
- we know our knowing, being participative, is inevitably limited
- we know that we ‘don’t know’.

This shift, from certainty to uncertainty or approximation, from control to participation, has been underway for a long time - and can be traced through the influence of von Bertalanffy’s work, of quantum physics and Heisenberg at the micro scale, and now the ‘new science’ of chaos and complexity. But this awareness, beyond science and in the

realms of cultural worldview, in social and economic policy and in what constitutes 'progress' has, as we have seen, been much slower to take hold. Meadows, co-author of the influential *Limits to Growth* study of 1972, wrote after working for ten years with global modelling:

> We know very much less than we think we know. I mean this profoundly....we have learned the severe limitations of the human mind to understand the behavior of any system with more than three species in it, or more than two interacting economic markets, or more than one renewable resource. In short, our minds are unable to simulate any systems we are really interested in. And the computer, while it can help, can still not encompass the full complexity of the real world.
> (Meadows 1982b, 4)

Brundtland (1987,139), the former chairman of the World Commission on Environment and Development, has characterised the four dominant beliefs of the industrialised West which now "must be called into question":

> that people dominate the earth; that they are masters of their destiny; that the world is vast and unlimited; and that history is a process of advancement with every problem solvable.

In short, there appears to be a slow but growing realisation of the need for deep change in our beliefs, attitudes and thinking, and this is the topic of the subsection (1.7) below.

We can now summarise some of the key ideas and beliefs underpinning the postmodern ecological worldview. These include change:

- of *perception* from 'I-it' to 'I-thou' relationships
- of *assumption* from the separateness of mind and matter, to a panexperientialist view of their co-evolutionary relationship
- of *conception* of an essentially dead and inert world, to an animate, dynamic and ultimately sacred world
- of *idea* of separate material 'environment', to a view of our embeddedness in a wider ecology which is both physical and non-material
- of *focus* from external physical world, to the relation between our inner and outer worlds and the acceptance of multiple realities
- of *models of order* from pathological hierarchy to healthy holarchy

- of *disposition* from control to participation
- of *agency* from outside intervenor to co-creator of reality and environment
- of *belief* in certainty and intervention to uncertainty and appreciation
- of *view of evolution* from mechanism to co-evolution
- of *view of knowledge* from a mono-universalism to diversity and contextualism.

Such ideas and beliefs imply and are expressed through a changed set of *thinking assumptions or habits* - a shift away from reductionism, dualism, determinism *et cetera,* towards whole systems thinking. Such changes are introduced and discussed below in section B.2.2. The ideas above also give rise to or affirm a set of *values* which reflect a sense of mutuality, of belonging and meaning in life, and may be seen as underpinning sustainability. Such values are suggested below (Box B.3).

Box B.3: Ecological values

- Sufficiency
- Conservation
- Equity / justice
- Community
- Respect for and appreciation of the Other
- Diversity
- Inclusion
- Democracy
- Subsidiarity
- Self-reliance
- Self-organisation and autonomy-in-relation
- Participation
- Futurity and trusteeship
- Resilience and durability
- System health and viability

I summarise the necessary qualities of change that underpin the emergence of the postmodern ecological worldview by employing the triadic model of paradigm, knowing and experience introduced earlier. These qualities can be identified as:

- *re-perception* - achieved by ‘extension’ in the Seeing domain
- *re-cognition* - achieved by ‘connection’ in the Knowing domain
- *realisation* - achieved by ‘integration’ in the Doing domain.

The nature of this shift is discussed in detail in **Appendix I** section 2. Meanwhile, an explanatory summary of this change follows (Box B.4)

Box B.4: Fundamental shifts towards an ecological paradigm

Seeing domain - Extension: the ethical need to widen and deepen our boundaries of concern, and recognise broader contexts in time and space. In an age of individualism and materialism, we are not encouraged to consider 'the Other' in our thinking and experience, whether this be the neighbour or community, let alone distant environments, peoples, and non-human species, or 'the needs of future generations'. So this is an inclusive rather than exclusive view, which recognises that all systems (and people) are in some way co-dependent and co-determining. As well as the outer dimension of extension, this empathetic disposition also suggest an inner 'deepening' process, which values all aspects of personhood, particularly intuitive knowing, and becomes aware of our individual and shared needs and worldviews. In systems terminology, the concern here is with context, meaning, and value, and shift in boundaries. The key quality here is greater 'compassion' or empathy which hinges on the 'quality of our assumptions' and involves *re-perception.*

Knowing domain - Connection*:* the disposition and ability to recognise and understand links and patterns of behaviour and influence between often seemingly disparate factors in all areas of life, to recognise systemic consequences of actions, and to value different insights and ways of knowing brought by others. The intellectual ability to know the world in a more ecological or relational way is more likely to give rise to respect in understanding and wisdom in action. In systems terms, the concern here is with dynamics and interrelationships, recognising and thinking in terms of flows and pattern rather than distinct entities . The key quality here is better 'understanding' which hinges on the 'quality of our distinctions' and involves *re-cognition.*

Doing domain - Integration: a purposeful disposition and capability to seek healthy relationships between parts and wholes, recognising that the whole is greater than the sum of the parts; to seek positive synergies and anticipate the systemic consequence of actions. Emergent properties in any system may always surprise us, but they are more likely to do so in positive rather than negative ways if we think, design, and act integratively and inclusively. In systems terms, the concern here is with self-organisation, systemic coherence, integrity and healthy emergence. The key quality

here is greater ‘wisdom’, which hinges on the ‘quality of our intentions/actions’ and leads to *realisation.*

In summary, I argue that

- extension/compassion,
- connection/understanding and
- integration/wisdom

are - respectively - needed to heal the *narrowness of perception*, *disconnective thinking,* and *dis-integrative practice* so often manifested both in education and society, and that this model summarises the essence of the ecological worldview.

1.7 Evidence of the postmodern ecological worldview in cultural change

In this subsection, I review evidence as to whether some form of ecological worldview is indeed arising - that is, whether the kind of ideas outlined above have any grounding and resonance in real change in society and culture.

As discussed above, the essence of the ecological worldview is *connection,* that is, concern with the meaning and implication of relation, and the quality of relation. This theme is central to virtually all writing which seeks to explicate aspects of this view, and it always concerns an expanded and deepened perception of connection than that which the writers deem to be generally prevalent in society. For example, this worldview, says Spretnak (1991, 19) “encourages us to expand the gestalt, our perception of the whole, in every situation so that we no longer collaborate in the modern project of fragmentation”.

This idea is also reflected in popular environmental culture. Much of the rhetoric of the environmental and New Age movements, abounds with phrases like ‘one world’, ‘we are all interconnected’, ‘only connect’ (a phrase which originated with EM Forster), ‘we need to think holistically’, and so on. These phrases indicate a popular feeling, as evidenced by the worldwide take up of Chief Seattle’s ‘All things are connected’ speech (which was later shown to be largely the work of a screenwriter in 1970). However, whilst perhaps reflecting an intuitive sense of relation, their popular expression do not give much guidance on how discourse and action can proceed. Superficially interpreted, and emphasising value change rather than structural change, they can lead to a rosy complacency which ignores suffering and injustice. Thus David Pepper, an ecosocialist, writes (1996, 300), “The problem about the whole approach is that in

its enthusiasm for value changes through mysticism and spiritualism it can largely ignore the material dimension of environmental problems".

Further, the New Age emphasis on the integration of 'mind, body and spirit', has often been interpreted on a highly individualistic basis which is blind to the needs of wider society. Satish Kumar, editor of a leading journal on ecological perspectives, *Resurgence,* responded to critics who equated (wrongly, is his view) his periodical with New Age-ism, by suggesting a new - more inclusive - trinity being 'Soil, Soul and Society'. Kumar's reponse reflects evidence that ecological thought is taking hold in some sections of society. Willis Harman, writing in 1988, states that evidence from survey data, social movements, book sales, Green political parties, "and numerous other social indicators" suggest what he terms a "*reperception*" which he believes "has been spreading around the world for at least the past twenty years" (1988, 118). He summarises its characteristics thus: "a search for wholeness, search for community and relationship, search for identity, search for meaning, and a sense of empowerment". Similarly, Milbrath reported - on the basis of survey - that a significant minority in the United States subscribed to values and beliefs that he termed the "New Environmental Paradigm" (Milbrath 1989).

A recent Worldwatch Report (Brown 2001) describes a further American study by Ray and Anderson published in 2000, which reports that some 26 per cent of Americans have adopted a new worldview in the past 40 years that is largely consistent with the values of sustainability. Gardner (in Brown 2001, 194) says that these people are characterized by:

> a concern for the environment, desire for meaningful personal relationships, commitment to spirituality and psychological development, disaffection with the large institutions of life, and rejection of materialism and status….and are likely to be active in their communities, to choose work consistent with their values, and to value healthy living.

Elgin (1997) quotes an earlier study by Ray which in 1995 numbers these so-called 'cultural creatives' (those seeking to create a new culture) at about 24 per cent of the US population. Thus, there has been roughly a 2 per cent increase in around four years. Elgin also quotes a large-scale 'World Values Survey' conducted in 1990-91, which represented almost 70 per cent of the world's population. In some dozen developed countries of the forty-three countries surveyed, the report concluded that a

shift towards postmodern values seems to be taking place. This includes loss of confidence in hierarchical institutions including government, and in science and technology to solve problems, more trust in own judgement, more interest in subjective wellbeing, purpose, and meaningful work, and greater tolerance for differences. At the same time, Elgin (1997, 14) recognises that there are powerful "countervailing trends":

> As postmodern values are emerging in the world, they are coming up against the stark reality of economic inequities, violence against women, and gender and racial discrimination.

This poses, says Elgin, "a major test of our emotional and evolutionary intelligence". Whether such trends can be said to indicate with certainty the emergence of a coherent ecologiical worldview is a matter of interpretation, but there is at least a discernable pattern here which indicates a break from the individualistic and material values associated with modernity.

In the sphere of intellectual discourse, Spretnak (1997, 223) remarks that in the recent past, those advancing the ideas of revisionary postmodernism "were vastly outnumbered by the deconstructionists", but detects a loss of adherents to the latter position in the 1990s as its limits became apparent - not least to those seeking to advance social justice or environmental quality. Thus she detects a growing shift of attention debate towards the revisionary intellectual landscape. To some extent, this is borne out by current research paradigm discourse, and this is explored in more detail in Part C.

I now want to look at the deeper patterns of evolutionary change in culture that might be occurring. Elgin (1994) suggests that two views - *'materialism'* and '*transcendentalism'* are currently dominant, but that an emerging *'co-evolutionary'* view integrates both. The first equates with the dominant paradigm, where material reality is considered prime, and evolutionary progress is seen in terms of material achievement - for example in science, technology, living standards and so on. Material growth, power and status are valued. In the 'transcendentalist' view - which New Age followers tend to espouse - matter is believed to arise from consciousness, so this is seen as the prime reality and evolutionary progress is seen as journey from the material world to the spiritual world. As noted above, Pepper (1996, 300) has pointed out that this transcendentalist stance can lead to over concern with 'self-knowledge', with little attention to the social context and the real-world environmental problems.

In the third position, the co-evolutionary view, “reality is seen as being comprised equally of matter and consciousness” which in turn (according to Elgin) are generated by “an infinitely deep life-force”. This integrative paradigm, Elgin suggests (1994, 246), “fosters a sustainable, planetary civilisation and a global wisdom culture” that brings together the “consciousness” approach of the Eastern traditions, and the “material” approach of the Western traditions and achieves a balancing and creative synergy. This integrative view logically implies, as I have suggested in several places above, that some characteristics of the dominant view are not entirely abandoned in the new ecological paradigm, but are (or would be) transformed through integration.

Both Elgin and Capra, as writers interested in current cultural change towards an ecological worldview, attempt to view things from a larger system level to gauge the pattern of long-term cultural change. As Capra (1982, 7) remarks:

> To understand our multifaceted cultural crisis, we need to adopt an extremely broad view, and see our situation in the context of human cultural evolution.

Both writers follow the earlier work of Toynbee on cultural change and the rise and fall of civilizations. Elgin suggests a pattern of cultural development beginning with hunter-gatherers some 35,000 years ago and projecting into the future. He suggests that humanity has come through three “beginning stages of awakening” wherein we separated ourselves from nature, developed our sense of autonomy, and discovered our abilities to rebuild the world in accordance with our designs. In the stages to come, he suggests, we will “re-integrate ourselves with nature, explore our deep bonding with one another and the cosmos, and develop our capacity to act in conscious harmony with the universe” (Elgin 1994, 239). This is equivalent to what Thomas Berry (2000) calls the ‘Ecozoic’ era. While Elgin is hopeful that this will come about in the longer-term future of humanity, he admits that “realism demands acknowledgement of the great uncertainty about the decades just ahead”. He foresees in this more immediate time-scale three alternative scenarios. These are summarised below:

1. *Collapse and rebuild from a devastated base.* This is based on an inability to respond to the current challenges such as ozone depletion, climate change, population growth, and others, perhaps leading to increased conflicts over resources, civil unrest and economic breakdown.
2. *Dynamic stagnation.* This is a stressful scenario based on making adjustments which would keep existing systems just about working, but with little or no overall system improvement.

3. *Mutually assured development.* Based on increased communication, learning, and cooperation leading to a restoration of ecoystems, a narrowing of the gap between rich and poor, and respect for diversity.

Which scenario is likely to prevail, Elgin says, depends on the choices made in the next few decades. But such choices depend in part, as many of the 'ecological' writers already referred to maintain, on the ability to envision alternatives. Elgin again (1994, 243):

> We cannot build a future consciously that we have not first imagined. Many people can visualize a future of worsening crisis - with ecological destruction, famines, civil unrest, and material limitation - but few have a positive vision of the world.

Capra (1982) believes that many of the negative social indicators that characterise current society such as increases in alienation, mental illness, and crime are part of the pattern of crisis and eventual transformation that characterises societies and cultures that are in the midst of profound change. Yet, as noted above, there is a strong case for *accelerating* our cultural evolution - to consciously try to attain something like Elgin's third scenario, before severe damage is done to natural and indeed human systems. This is the clear message of global environmental reports such as WWF's annual *The Living Planet Index (*Loh 2002*),* or of UNEP/UNDP/World Bank/World Resources Institute's report *World Resources 2000-2001: People and ecosystems, the fraying web of life*, (2000), or of the Worldwatch Institute's annual reports on the State of the Planet. In particular, the 2001 issue of the Worldwatch report, cited above, states that, "the most difficult challenge the world faces is how to build an environmentally sustainable economy before we do permanent damage to the natural systems that support our global civilisation (Brown 2001, jacket)".

A critical point here is that the visioning and imaging that this requires needs to occur, as far as possible, at *all systemic levels of knowing* (see Box B.1 above). Calls such as O'Riordan and Voisey's (1998, 3) for 'new ways of knowing' and Laszlo's (1989, 29) for 'redesigning our thinking' imply that technical or material 'solutions' can only ever be *part* of the answer. This is not to belittle them: the ideas of, for example, *Factor Four* (Weizsäcker, Lovins and Lovins, 1997) which seek to double wealth on half the resources through *efficiency* gains are extremely important in the struggle to realise sustainability, but they apply primarily at the material, visible, practical end of the systems hierarchy of knowing. They do not extend to fundamentally re-thinking the

beliefs which have brought about the sustainability crisis in the first place. For example, little is said by those advocating technological sustainability about *sufficiency* or *equity*.

My argument here is that, taking a whole systems view of human knowing, we need to envision the meaning and implications of ecological thinking at *all* levels, from metaphysical to practical manifestation, from deep to everyday. This indeed is what an increasing number of 'ecological' writers/thinkers have been attempting in the last twenty or so years. To indicate this ground and further exemplify thinking about the postmodern ecological worldview, I have included ten various paradigm tables that have been presented by different authors, and these can be found in the **Appendix II,** under Part B.1.7 and labelled 'Tables B.1 to B.10'.

With the *systemic levels of knowing* model in mind, I have ordered these tables into three groups (1-3, 4-6, 7-10) from the deeper levels (at the bottom of the list e.g. Skolimowski) towards the more immediate and practical (at the top e.g. Korten). This is a rough ordering, because some writers attempt to span different system levels. The authors are as follows:

1 Van der Ryn and Cowan (1996) - ecological design
2 Costanza, Daly and Bartholomew (1991) - ecological economics
3 Korten (1993) - competing development visions

4 Harman (1994) - a science of wholeness
5 Elgin (1997) - contrasting (cultural) paradigms
6 Slaughter (1995) - ideas in decline, resurgent ideas

7 Spretnak (1997) - modern, postmodern and ecological descriptors
8 Norgaard (1994) - development premises
9 Berman, after Bateson (1981) - Cartesian and Batesonian worldviews
10 Skolimowski (1981) - present and eco-philosophy

There are a number of points to be made about these tables:

- that the tables are all written from an ecological point of view, and therefore are arguably skewed towards a sympathetic, and perhaps uncritical, view of the ecological paradigm but a critical view of the modernist worldview.

- that the presentation of two-column models is inevitably simplistic. No doubt the writers would want the tables to be read in the context of the books from which they are taken.
- that the notion that the ecological worldview incorporates and subsumes aspects of modernity, rather than rejects/replaces them, is not always evident in these tables - although this might be part of the weakness of the structure of two column models.

As noted several times in this Thesis, much discussion of paradigms tends to present them as necessarily oppositional, and incommensurable in the Kuhnian sense, leaving little sense of how the much debated 'paradigm shift', can be understood in terms of dynamic cultural change. The familiar bi-polar model of opposing paradigms - as presented by these writers tends to oversimplify median positions, and subparadigms: this is a criticism made by Routley (1983). Yet as a model, I find these tables to be very helpful tools for thought, as long as we bear in mind that the actuality is less simple than the bi-polar model presents. For example, I have suggested a set of six possible relationships between 'the old' and 'the new' (oppositional, alternative, hybridising etc.) in subsection B.1.5 above.

As regards consistency between the models, what matters here - I believe - is not the differences between the versions of ecological thinking presented, but the commonalities between them and progression shown between the systemic levels of knowledge. In other words, the question is whether there is overall systemic coherence here within and between the versions shown. Whether this is the case or not, is in the end a matter of judgement. My view is that ecological thinking is showing an increasing level of systemic coherence which helps validate its paradigmatic claims.

The next subsection looks at how far such thinking is apparent in the sustainability debate - how far integrative thinking is beginning to challenge mainstream fragmentary thinking in the social and institutional response to the sustainability question.

1.8 The manifestation of the postmodern ecological worldview in the sustainability debate

We can at the outset note that the whole sustainable development debate has turned - at least *in part* - on the growing realisation that thinking and action needs to be more *integrative* than that which has normally characterised the past. This has been an increasing trend, and is one of the main themes and findings of a recent survey of the

politics of sustainable development in nine developed countries (plus the European Union) (Lafferty and Meadowcroft 2000).

These authors review a number of accounts of sustainable development both before and after the Earth Summit conference of 1992 and the associated discourse, and conclude that, while allowing for a "conceptual-political" range of views:

> sustainable development indicates an interdependent concern with: promoting human welfare; satisfying basic needs; protecting the environment; considering the fate of future generations; achieving equity between rich and poor; and participating on a broad basis in development decision making.
> (2000,19)

Further, they point out that the concept has provided a framework whereby ideas and interests which were hitherto seen as *separate* or oppositional might be reconciled, and they list 'economy and environment', 'conservation and progress', 'efficiency and equity', and the pre-occupations of North and South.

Going back some thirty years, an integrative view was strongly advanced by the influential *Limits to Growth* study (Meadows, Meadows and Randers 1972), which recognised the reality of what was later termed by the Club of Rome "the world problematique" (Peccei 1982, King and Schneider 1992). This 'problematique' is the set of closely interconnected problems - political, economic, social, cultural, psychological, technological and environmental - that characterise the modern age and which, because of their systemic nature, fail to respond to non-systemic approaches. The Limits to Growth study was essentially based on a systems view of the world and has been influential in subsequent work that has linked systems approaches and sustainability.

Going back some twenty-plus years, an integrative view was also reflected by the World Conservation Strategy (IUCN, UNEP, WWF 1980) which considered together 'conservation' and 'development'. Instead of being seen as implacably opposed forces, the Strategy was the first internationally endorsed document to argue that they were interdependent. The Strategy had considerable influence on debate and thinking about environment and development, and one might argue that this was due to its bold challenge to conventional assumptions. Hence, it required all those involved in development to recognise environmental imperatives and factors, and all those involved in conservation to consider people and the need for economic activity and

development. Thus, in the eighties, in the evolution of environmental thought, a transition took place between a general perception of separate and relatively contained environmental issues, towards a more integrated view of environment and development, emerging - most notably and influentially in the Brundtland Report (WCED 1987) - as ‘sustainable development’.

Sustainable development was not a new theme; the British philosopher John Stuart Mill had alluded to it many years earlier, and it also was the key theme of *The Ecologist* influential study *Blueprint for Survival* of 1972. In 1981, Lester Brown of the Worldwatch Institute published an influential study *Building a Sustainable Society* which set out the issues and pathways to a more sustainable society. In 1987, the Brundtland Report tried to take an holistic view of environment and development issues and also implied that some of the problem lay in our use of language, (which in turn relates to Western epistemology and perception):

> Until recently, the planet was a large world in which human activities and their effects were neatly compartmentalised within nations, within sectors (energy, agriculture, trade), and within broad areas of concern (environmental, social). These compartments have begun to dissolve. This applies in particular to the various global “crises” that have seized public concern...These are not separate crises: an environmental crisis, a development crisis, an energy crisis. They are all one.
> (WCED, 1987, 4)

While on the next page we read, “Ecology and economy are becoming ever more interwoven - locally, regionally, nationally, and globally - into a seamless net of causes and effects”. It can be said then that the Brundtland report took a relatively holistic and systemic view of environment and development issues. Yet, *only to a point.* The ecological economist Daly for example, points out the ‘glaring contradiction’ of a world economy growing by a factor of 5 or 10 whilst purportedly respecting ecological limits (quoted in Skirbekk 1994, 49).

The concept of sustainable development launched upon the world by the report (and subsequently reaffirmed by the consequent United Nations Conference on Environment and Development, UNCED), was at first quickly taken up with equal enthusiasm by all groups, including non-governmental organisations, academics, governments and industry. As David Orr noted (1992, 23), “the word ‘sustainable’ pacifies environmentalists, while ‘development’ has a similar effect on businessmen

and bankers". However, in the ensuing debate, large cracks in the consensus began to appear. By the time of the Rio UNCED conference in 1992, the debate had moved on. The basic division was between those advocating growth-centered 'technological sustainability' (sustainable growth), and those advocating people/environment centered 'ecological sustainability' (sustainable development) - complicated by the fact that those using the term 'sustainable development' often meant 'sustainable growth'. Orr (1992, 24) sums up the situation thus:

> These two perspectives are partly complementary, but their practitioners tend to have very different views about the extent of our plight, technology, centralised power, economics and economic growth, social change and how it occurs, the role of public participation, the importance of value changes, and ultimately very different visions of a sustainable society.

The sustainability debate then, is characterised by a basic rift, which can be seen as rooted in different paradigms. This suggests the situation is a simple contestation between two, perhaps equally valid, views. But this would be understating the complexity of the situation. Lafferty and Meadowcroft state that on the ground, their research suggested the situation is "fluid, contradictory, chaotic, and fragmentary" and that there are, "many orientations, priorities, and visions of the future jostling for influence" (2000, 453/454). But in their concluding remarks, they ask how far governments are taking sustainable development seriously as, "a *different* idea, goal and agenda for change: different from conservation, different from environmental clean-up and protection; different from ecological modernization, narrowly conceived" (458, their italics). Thus, while there are many views of what sustainable development means, there are also - the authors imply - different *levels* of perception and understanding operating.

Here we can look again at the model of learning levels, as outlined in B.1.3 above. What I shall argue is that an ecological consciousness is arising from a struggle to realise epistemic learning - and that this consciousness recognises the need for reconstruction and learning *throughout* the learning levels and system levels of knowing. The mainstream position, which Orr characterises as 'technological sustainability' and which is rooted in what has been called here the dominant paradigm, is arguably largely rooted in the first-order learning position and finds it difficult to progress beyond the measures associated with this stance (such as ecoefficiency and clean-up) without undergoing paradigm change i.e. deep or transformative learning. At the same time, Lafferty and Meadowcroft indicate that a gradual shift or learning

process has taken place on the part of policymakers since Rio, (although they themselves make little specific mention of 'learning' as such). They find for example, that "in the historically short span of three decades":

> The complexity, interconnectedness, and uncertainty surrounding environmental issues has become better appreciated, as has the intimate contact between environmental policy and other spheres of government and social policy.
> (2000, 443)

Perhaps then, there are signs of a dawning second order learning - an incipient realisation of paradigm. This idea of gradual shift ties in with O'Riordan and Voisey's helpful idea of the 'sustainability transition', (first introduced in A.1.1). In a major study, *The Politics of Agenda 21 in Europe* (1998) funded by DGXII of the European Commission, these authors suggest that a four-stage shift in the transition to sustainability is necessary, from 'very weak sustainability' to 'very strong sustainability', characterised by changes in environmental and economic policies, in degrees of public awareness and in types of public awareness, with the last phase involving:

- much closer integration between environmental and economic policy,
- a cultural shift in public awareness (partly facilitated through change in education), and a
- renewal of emphasis on local democracy and activity.

Their thinking is summarised in table B.1 below.

Table B.1: The transition to sustainability

Sustainability	Environmental Policy	Economic Policy	Public Awareness	Public Discourse
Stage 1 ***Very weak***	Token policy integration	Minor change to economic instruments	Dim awareness, little media coverage	Corporatist discussion and consultation
Stage 2 ***Weak***	Formal policy integration and specific targets	Substantial restructuring of economic instruments	Wider public education	Roundtables, and stakeholder group participation
Stage 3 ***Strong***	Binding policy integration and strong international agreements	Full valuation of cost of living and green accounting	Curriculum integration and local educational initiatives to strengthen community	Community involvement together with North-South initiatives
Stage 4 ***Very strong***	Strong international conventions and national statutory and cultural support	Formal shift to sustainability accounting at all levels	Comprehensive cultural shift	Community-led initiatives are the norm

Adapted from *The Politics of Agenda 21 in Europe*, Tim O'Riordan and Heather Voisey,

Later in the Thesis, (C.2.4) I make a direct parallel between *learning responses to sustainability* both in society (as above) and in education. These learning responses can be illuminated through the systems idea of 'orders of change' - which is closely associated with that of learning levels. This idea is outlined above in B.1.3. Using this theory, it is possible to suggest that the mainstream response to sustainability is essentially one of maintenance and adaptation i.e. a response which, although taking on board some aspects of sustainability, essentially still maintains the stability of the system (and its political, economic and social subsystems). Again, taking a systems viewpoint on what appears to be happening: the challenge of sustainability (or the highlighting of unsustainable patterns) may be interpreted as an outside perturbation or disturbance to existing systems, including belief systems. The initial learning response (equating with 'very weak sustainability', which is at least a step beyond ignorance or outright denial) is to adapt just sufficiently to *accommodate* this disturbance, without fundamentally changing the whole system. Bell and Morse (1999, 103) suggest that Maturana and Varela's work on *autopoesis* in living systems - which sees such systems as essentially self-referential - helps explain why organisations can be "progressive and inclusive, or narrow and blinkered". Disturbingly, O'Riordan and Voisey (1998, 2) suggest that many of the institutions "that need to be readjusted in order to embrace the sustainability transition" actually thrive in a non-sustainable world:

> The innate logic of these institutions encourages them to vary marginally the status quo, though never more than is suboptimally tolerable…..No wonder

> sustainable development is taking time to be credibly articulated in policy and day-to-day behaviour.

First order change then, is associated with making adjustments in the existing system, with 'more of the same', with increasing efficiency and effectiveness to meet identified goals: this sometimes called 'doing things better' (Ison and Russell 2000, Banathy 1991). Thus, for example, we have the whole green auditing movement including ISO 14001, EMAS, and ecoefficiency in production. This is not to denigrate such change, but to try to account for why change often stops at these more immediate levels. In relation to the systems 'levels of knowing model', we can say that first order change involves change at the more immediate levels of behaviour, without change at deeper levels of knowing. If these models and arguments are valid, they help provide an explanation of:

- why weak sustainability is a likely and pervasive mainstream response at all system levels (individual, community, organisation, national and international policy *etc.*)
- why integrative thinking and integrated policy in the mainstream (including educational policy and practice) only goes 'so far'
- why rational argument alone, or warnings of crisis, are not sufficient to invoke deep change.

A first order response to sustainability tends to be that of attempting to grasp, contain and control it, as if it were an external 'thing'. This reminds me of Whitehead's 'fallacy of misplaced concreteness', the mistake of rendering abstractions as concrete 'things' - rather than seeing sustainability as an emergent quality. Bell and Morse's (1999) book *Sustainability Indicators – Measuring the Immeasurable* is of particular interest here. Writing from a systems background and perspective, the authors are critical of the burgeoning attempts over the last few years to tie down sustainability through trying to arrive at 'exact measures':

> Although many have tried to quantify sustainability - with all the jargon and apparent rigour of the objective and reductionist mindset of much of the academic community - when looked at more closely the approaches do not seem to work.
> (1999, xii)

Instead, the authors attempt to set out "a more holistic, realistic, participative and systemic approach to gauging sustainability". As their chapter 4 'Paradigms and

Professionals' shows, the fundamental argument again, is between operative paradigms. The tension, they suggest, is between the scientism, objectivism and reductionism of the dominant paradigm, and an emerging paradigm which the authors describe as systemic, holistic and participative. The former approach, say Bell and Morse, sees sustainability as a 'thing' that can be identified, and through scientifically inspired methodology, can be quantitatively measured. But sustainability is not a single or fixed thing, say the authors, and the quantitative approach tends to both oversimplify the complexity of sustainability and reduce "a variety of relevant and legitimate views and understandings to the dominant mindset of the scientist" (1999, 100). Similarly, even with respect to physical aspects of sustainability, which at first sight appear amenable to conventional scientific analysis and measurement, O'Riordan and Voisey (1998,11) suggest:

> scientists remain very vulnerable to immense uncertainty when trying to assess survival thresholds or capacities of tolerable resource depletion. What, for example, would be the true indicators of the ecological health of the North Sea? Since keystone and indicator species alter so frequently in their ecological roles, we are left with the uncomfortable conclusion that we may have to impose our own political discourse on ecosystem processes and critical loads.

Thus, Bell and Morse emphasise the importance of context, of local knowledge and perspectives, and of multiple views (of which the objectivist view, they say, might be one). Further, the authors equate sustainability with the quality of wholeness, with the "perception of systemic wholeness" and "the sustainability of wholeness" (101). The authors also make the distinction between first order and second order change, and suggest the problem of sustainability indicators requires recognition of our own participation in making meaning of and interpreting sustainability. Bell and Morse's thinking is in line with my own - but yet I feel it doesn't go far enough. What is missing, is any strong sense of what I am calling here the ecological worldview, and yet the ecological worldview is implied. As the authors recognise, sustainability raises epistemological, ontological and methodological issues, and while they are strong on the methodological implications of a systems approach to sustainability, they are weaker on the other two key aspects which are necessary to challenge the overly scientistic approach which they critique.

A different position on sustainability is what might be called a deconstructionist position. This rejects the suspect certainty of the technological/objectivist sustainability approach, and further, does not recognise the validity of the ecological position.

However, the deconstructionist position and ecological position are agreed that we do not know and cannot prescribe any blueprint for approaching or achieving sustainability. They are also agreed that there are, and need to be, multiple views of sustainability. But from this point there is a very significant departure. First, because the ecological view sees a need for multiple views of a complex reality or problem to provide a richness of perspectives that may together provide new insight. Thus Bell and Morse state (1999, 80) that "Alternative views or even multiple views of reality are encouraged in a truly systems approach". So this is a revisionary view, rather than a deconstructionist view, which is essentially relativist.

Second, the ecological view differs markedly because it asserts that *there are* principles and values which must be part of any movement towards sustainability. As O'Riordan and Voisey suggest, while there is "no template for the transition to sustainability...*there is a direction and there are principles*..." (1998, xv, my italics). This is a vital point, not least as in my experience, a significant part of environmental education debate (particularly in academic circles) tends to be influenced by the deconstructionist position - for the best of reasons - which denies the possibility of such principles.

Outlining these principles, O'Riordan and Voisey suggest that three conditions should underpin "any serious analysis of sustainable development" and which are mutually necessary and co-dependent (1998, xiv):

- continuation, durability and reliability of economic performance
- stewardship, trusteeship and a duty of care towards vulnerable ecosystems and peoples, and to future generations
- localism, democratic innovation, and greater self-reliance in communities.

Similarly, such principles as democracy, community, localism, participation, durability, diversity, self-reliance, sufficiency, efficiency, and equity are common themes in what might be termed ecological perspectives on sustainability, and are reflected in such on the ground schemes as Local Agenda 21 initiatives, but - and this is key - if sustainable development is allowed to flourish, it will produce "a huge variety of outcomes at many levels" (O'Riordan and Voisey1998, xv). So the ecological view *does not* provide prescriptive solutions or blueprints, but it *does* indicate directions - which need to be translated and adapted according to specific contexts. Critically, from an alternative paradigm at the level of third order change - that is, a different way of looking at the

world - different sets of actions at the first order level become available. The guiding star here is not ‘doing things better’ (as mentioned above in connection with first order change) but ‘seeing things differently’ which in turn leads to ‘doing better things’.

One of the key ideas which expresses the ecological paradigm is self-organisation. O’Riordan and Voisey acknowledge this (and indicate their own position) by stating (1998, 6): “at the heart of sustainability is self-generation - of the soul as well as of economy, polity and society” and they align this idea directly with the Gaian view of the Earth as a self-regulating organism. Thus at conceptual level, the ecological view of sustainability is expressed through such principles as self-organisation and autopoesis which underpin a coherent ‘living systems’ view of reality. (This is looked at in more detail in **Appendix I**.) These concepts are implicit in many of the ideas that surround the sustainability debate from ecopolitics to ecodesign, but at deep level they challenge the assumptions of the dominant paradigm to do with determinism, reductionism and control.

From an ecological point of view, sustainability (in all its aspects, social, economic, political, environmental) appears to require what might be termed a ‘double-shift’ in thinking. In other words, first, a vertical or deepening shift which involves epistemic learning about the limits of modern and deconstructionist positions, and second, a horizontal shift through time towards a larger gestalt which the ecological worldview appears to promise. In terms of analogy, it is not just a matter of escaping the prevailing cage, or ‘trap’ to use Vickers’ term, but also finding an alternative platform. (This is represented by Diagram A.1a in Part A.). Meantime however, the response of the mainstream political, economic, and social culture to sustainability largely remains one of accommodation or at best limited reformation, rather than deeper transformation (Christie and Warburton, 2001). As noted above, paradigm change theory and learning levels theory helps explain this limited learning response.

In sum, there are some signs of an ecological view in the social and institutional response to sustainability, but these are limited. Systems thinking might be reasonably seen as a means of developing a more fully-fledged ecological response, but this depends on how far systems thinking is part of, or apart from, the ecological paradigmatic shift. This is the next topic.

2 SYSTEMS THINKING IN CHANGE

The theme in this second section of Part B is evolutionary change in the field of systems thinking. I examine how far it is embracing - and indeed, can help articulate - the postmodern ecological worldview, and I further explicate the nature of whole systems thinking which, I argue, requires an expanded sense of systems. This requires greater convergence between systems thinking and ecological thought. (At this point, it will be useful to bear in mind the use of terms as summarised in Box A.2 'Clarifying terms', in Part A.1.1.)

2.1 Evolutionary change in systems thinking

Systems thinking, like any other field, is in a state of change. As we shall see, there is definitely a perceptible move within the field of 'systems as discipline' towards (what I am calling here) whole systems thinking, based on the 'living systems' view of the world, and on the new sciences of complexity (Capra 2003). As ecological thinking is also increasingly referring to these bases, the potential for more convergence between (some schools of) systems thinking, and ecological thought - around a commonly understood *whole systems thinking* – appears great.

I want to first trace a little background and history of systems thinking. It is not necessary to trace this in any detail - it is already well documented (Checkland 1981, Capra 1996, Flood 1999, Flood 2001), and there is little point in writing it out again. What matters here is the fundamental pattern of change in systems approaches over time.

Systems thinking as a recognisable discipline, that is, as identified and distinguished from its evolutionary roots and influences, is relatively young (Checkland 1992), emerging in the twentieth century as a response to and critique of the prevailing reductionism (Flood 2001). Most writers in the field point to modern systems thinking as developing from two main directions and sources, being engineering and biology. The engineering roots began in the 1940s, notably with Weiner's work on cybernetics, which is usually understood as concerned with control and communication. The biological roots were drawn as early as the 1920s, particularly through von Bertalanffy's work on open systems, and later, his 'General Systems Theory'. This made a further critically important contribution which has since had seminal influence in the field (von Bertalanffy 1968). In the decades since, 'systems as discipline' has developed considerably "from a number of different traditions which may not inform each other" (Ison, Maiteny and Carr 1997,258).

Thus, despite its ostensibly holistic nature, systems thinking has emerged from its two main sources, and divided into a number of emphases, methodologies and applications. Ison's 'influence diagram' (Diagram B.4 in **Appendix II**) maps the main traditions in systems thinking. Despite the variety of schools or traditions, most of them place emphasis on methodology, and particularly on problem-solving. It is these schools that I am collectively calling 'systems as discipline'. This is on the grounds that: systems scholars themselves regard systems as a discipline, there are academic departments devoted to their advancement, there is a fairly large literature devoted to systems ideas, methodologies and tools, and there are national and international systems societies. Further, very largely, most other disciplines and the 'man in the street' know little or nothing about systems thinking as a discipline, which, in a rather ironic way, confirms that systems thinking as a diverse field is nevertheless relatively contained within the boundaries of a discipline. It is ironic because a critical aspect of systems approaches is to question the perception, location and meaning of boundaries (Blackmore and Ison, 1998).

Of course, by using this term 'systems as discipline', I have used a boundary to group together a number of approaches and methodologies, some of which have had little to do with each other, or even been in some conflict for some time. The fundamental tension is between the more mechanistically based, more objectivity oriented, 'hard system', or 'closed system' approaches - reflected in systems engineering, systems analysis and operational research - and the more organicist, constructionist, 'soft system' approaches. The first is concerned with problem-solving, control and feedback, the second with understanding and influencing change; the first with being an observer and manager, the second with being more a participant and actor. Checkland (1980) explains that hard systems thinking derives from the engineering tradition where the problem is definable and defined, and the task is to select and provide an efficient means of achieving the desired end or stated objectives. This approach, "looks at 'how to do it' when 'what to do' is already defined" (Checkland and Scholes 1990, 17).

Chambers notes that Checkland developed soft systems methodology (SSM) at Lancaster University when he found that the problem-solving approach derived from systems engineering failed when applied to messy, ill-defined problems. That is, situations where "the notions of a 'problem' and a 'solution' are inappropriate, and what makes more sense is a process of learning which is never-ending" (Chambers, 1997, 196). What is needed in this - often more prevalent - situation according to Checkland

and Scholes is “a system of enquiry” (1990, 18), and this is what soft systems methodology attempts to be, stressing the centrality of our interpretation rather than independent and contained problems ‘out there’.

This development in systems thinking can be seen as a shift of emphasis from concern with first order change to second order change (as described above in B.1.3). As Ison, Maiteny and Carr state (1997, 258):

> Recent systems scholarship has moved beyond many of the concerns of ‘first-order cybernetics’ (or ‘hard’ systems methods) to those of second-order (or ‘soft’ systems).

Philosophically, the critical difference between these approaches is the assumption in hard systems methodology that there really are systems ‘out there’: by contrast, the soft systems approach sees systems or holons as useful metaphors for understanding a complex reality and change. Checkland’s concern is that too often, systems people fail to “make this intellectual distinction between real-world happenings and the epistemological device which may help to make sense of them” (1992, 1029), that is, they fail to distinguish between ontology and epistemology. In the (soft) systems field, Checkland continues, “we are concerned with the attempt to map the concept of wholes onto what we perceive as complex happenings in the real world”. This links with my comments above on Bell and Morse’s work on sustainability and indicators, where they reject the ‘hard’ approach, in favour of a soft systems methodology. But as I noted there, what is missing is a sense of the ecological worldview. Checkland’s work also misses this, and any real sense of the need for greater social justice and ecological sustainability.

For example, Flood’s criticism is that SSM, “barely touches upon the notion of knowledge-power and social transformation” (1999, 60), that is, the role of politics in what counts as valid knowledge. It is a criticism that Flood also make of Senge’s work. Further, Checkland’s reference to ‘worldview’ in his well-known SSM mnemonic CATWOE (Customers, Actors, Transformation, Worldview, Owners, Environment) (Checkland and Scholes 1990) often refers to a subparadigmatic level of worldview, while his reference to ‘transformation’ can mean any form or level of change, and does not imply any liberatory or emancipatory process. These uses are perfectly valid, but do not address the larger context of the need for deep change in cultural worldview or transformation that has been discussed in this Thesis. Whilst ‘soft systems’ approaches, particularly as developed by Checkland, have made a seminal

contribution to the systems thinking field, they may be said to be 'necessary but not sufficient' in the articulation of whole systems thinking.

I want to quote further from Checkland to illustrate this point. It is clear that he is most opposed to any idea that smacks of systems thinking being 'ideological', and comments very critically on a reference that suggests that systems approaches are 'intrinsically emancipatory'. He gives a graphic example, saying that systems engineers would have been able to make the Nazi's holocaust more efficacious, and more efficient. He regrets "much writing in the systems field which would import ideological concepts into (systems) epistemology, where they have no proper place" (Checkland, 1992, 1029). In a sense, I think he is right - but only if systems approaches are regarded purely as a methodology, which can be employed within *any* valuative framework . But I am arguing that the larger cultural context in which this methodology is being employed is changing, and there is evidence of the emergence of an ecological worldview which suggests a deeper shift of epistemology, than the level that Checkland is addressing here. To summarise quite simply, the emergence of SSM maybe said to be evidence of second order change in systems thinking, whereas whole systems thinking (WST) derives from or aspires to third order learning.

In recent years, a significant part of systems scholarship has moved in the direction of exploring the implications of complexity theory, holistic science and recent theories of living systems, which are opening up debate and thinking about the need for a more participatory worldview, and particularly in relation to sustainability (see for example, Capra 1996, Capra 2003). It is this that takes the field of systems thinking into significant new territory.

- Keypoint: It is a foundational argument of this Thesis that this territory is of *equal interest* to *systems as discipline* and to *ecological thinking*, thus there is a *convergence of interest* here (Capra 1996), which I am calling whole systems thinking, or systems as worldview.

However, it must be said that the perception among some ecological thinkers is that *all* systems thinking is 'part of the problem', that it never fulfilled its early promise, and that it has been co-opted. For example, the ecophilosopher Skolimowski (1994, 171) comments:

> Systems thinking and cybernetic thinking have been 'objectivized' and then co-opted. In the process their potential novelty as *new* forms of thinking has been

> diminished. They have become status quo forms of thinking. Every big corporation and every big government uses systems thinking and cybernetic thinking. Are we better off as a species and as individuals for this reason?

Similarly, Joanna Macy (1990, 41) a systems scholar, states:

> The systems view of the world, unfortunately, has not characterized or informed the uses our society has made of systems science. The advances permitted by its perceptions of pattern and its models of circuitry have been mainly employed to further values and goals inherited from a mechanistic, reductionistic interpretation of reality.

Similarly, Berman (1989, 305-306), an advocate of Batesonian holism, warns strongly against what he terms ‘cybernetic holism’, and the ‘co-optation’ of the holistic worldview by advanced mechanism. He is equally concerned by a ‘systems view of life’ not wedded to “real presence, real bodily engagement with the world”. This it seems, is additional fuel to my argument that systems as discipline is not sufficient in itself to address the epistemological crisis that writers such as Berman, Bateson and Skolimowski point to.

During the last century, systems as discipline was influenced and (arguably) constrained by the broader prevailing social, scientific and cultural paradigms within which it operated - perhaps more than its progenitors anticipated. Thus, Ackoff, a leading systems writer, suggested in 1974 that the 1940s marked “the beginning of the end of the machine age and the beginning of the systems age” (in Lockett and Spear 1980, 26). Yet the ‘systems age’ arguably - and certainly as seen by Skolimowski and others - has until recently been accommodated as part of the mechanistic paradigm rather than the other way round.

Thus, the identification by some environmentalists of all systems approaches with the mechanistic paradigm, whether or not deserved, has often led either to narrow interpretation and restricted application of systems thinking in environmental education, or the rejection of systems thinking as a means of working towards sustainability (Gough 1991, 1993). According to Gough, “Systems models perpetuate Newton’s ‘world machine’ by reinforcing the view that environmental systems are metaphorically equivalent to mechanical or cybernetic systems”. This criticism is echoed by Wilber (1996, 116) who accuses systems theorists of “subtle reductionism” and providing

another “reductionist nightmare”. Similarly, the social ecologist, Bookchin (quoted in Button, 1988), notes that the language of cybernetics - born of wartime research into missile guidance - has replaced living terms with the language of ‘feedback’, ‘inputs’, ’information’ and so on.

I would go less far in criticising ‘systems as discipline’. Nevertheless, while systems methodology ostensibly implies epistemological and ontological orientations which challenge those of the dominant paradigm, systems approaches have often been little more than tools for problem-solving within the values and outlook of that paradigm. Yet a key argument of this Thesis is that ecological thinkers and practitioners, and educators, who dismiss systems thinking are ignoring a powerful mode of thinking which would, at least, enrich their discourse, and moreover, enable their work to be more effective in understanding and perhaps addressing the essentially systemic issues with which they are concerned .

Thus, I want to defend systems thinking, but I recognise that to address the criticisms and dangers touched on above, it is necessary to articulate an expanded or deepened sense of systems thinking, one that is commensurate with (and indeed is, I would argue, embodied in) the emergent postmodern ecological paradigm. This is why I have used the term ‘whole systems thinking’, which can be realised by ‘reinventing’ and ‘reinvesting’ our view of systems thinking. To some extent, the rejection of systems approaches by some in the ecological movement reflects a problem of language, or more precisely, language-as-model. By itself, the word ‘systems’ in ordinary usage does not necessarily convey the levels of meaning that I attach to it (in fact, my experience is that it rarely does). It may be that I (or we) should be talking about *‘holonic’* thinking, and ‘holonic’ education, echoing Koestler’s term, but to most people, this would convey even less. Holonic relationships are an important concept in elaborating whole systems thinking however, and one to which I return in **Appendix I.** In the same book as he voices rejection of systems thinking, Skolimowski (1994) identifies what he terms *‘participatory thinking’* which largely equates, in my view, with systemic thinking as it is expressed within the postmodern ecological paradigm.

The distinctions at play in this area increase the difficulty of clarifying what is meant by whom, and of communicating meaningfully. As such terms as ‘systems thinking’, ‘holistic thinking’, ‘participatory thinking’, ‘ecological thinking’ and so on are not concisely defined or agreed, it is important to be careful in their use (see my definitions

in Box A.2 in section Part A.1.1). I would place all the following uses as consistent with my understanding of whole systems thinking:

- ecosystemic thinking (van der Hoorn 1995)
- organic systems view (Pepper 1984)
- ecorelational thinking (Engwicht 1992)
- reflective living-systems thinking (Elgin 1997)
- whole systems thinking (Korten 1995)

As noted above, systems thinking is rejected by a number of writers who come from an ecological perspective. It is reasonable to suppose that they represent a significant part of the 'ecological paradigm' community. But another reaction, which I have noticed from my own involvement and experience in the field, is the ignorance of many about systems thinking. For example, arguably everything that Schumacher College - 'an international centre for ecological studies' - does, is systemic (Sterling and Baines 2002). It is grounded in exploring and enacting how relationships of all kinds can be bettered and made more whole. Yet, a number of conversations I've had with course participants and staff otherwise steeped in aspects of ecological thought and practice, indicate a common lack of awareness and knowledge of the field or discipline of systems thinking.

Yet, as noted above, I would argue that there is a *gradual convergence* taking place, which adds credence to the notion that a postmodern ecological worldview is becoming more strongly recognised and expressed. While 'systems as discipline' is increasingly reflecting the ideas of living systems and complexity theory, ecological thinking and practice is also increasingly informed and inspired by the same perspectives and emerging field of enquiry. In addition, there is a perceptible - and I think very significant - convergence at the deeper levels of philosophy. Thus, in his review of the main systems thinking 'schools of thought', Flood (1999, 83) writes on "the essence of systemic thinking" and states:

> Systemic thinking is not something that can be explained easily and understood comprehensively. It is not recommended to rush into rationalisation of this sort…Systemic thinking begins with an intuitive grasp of existence.

Thus, this deeper view of systems thinking is turning away from the idea that it is 'only' a methodology concerned with such things as systems efficiency and effectiveness, and towards the idea that deep existential questions turn on what and how we know.

2.2 Towards whole systems thinking

Ackoff's belief, stated in 1974, in the ascendancy of the 'systems age' incorporating rather than being incorporated by the mechanistic age, may yet be broadly proved right. The current interest in systems thinking circles in living systems theory and complexity theory together with an awareness that systems thinking has an important place to play in addressing what are increasingly complex, systemic issues which affect living today (Capra 1996, Ison and Stowell 2000, Capra 2003), indicates a potentially much bigger role in the future. This evolution in the development of systems thinking lends strength to the notion that it can provide an important *bridge* and a means of going beyond the influence of mechanistic and positivist paradigms in our thinking towards something much more holistic - *particularly* if it can link more overtly with the ecological worldview, to synergistically give rise to 'whole systems thinking': further, if this is accessible and understandable rather than contained within the confines of an esoteric discipline.

This potential role of systems thinking - as a transformative bridge - remains a key assumption of this Thesis, which is not tested empirically here, but would be an important basis of further research. I am assuming then, that an educational paradigm based on a whole systems approach, would help lead not only to a systemic awareness and competence amongst all those involved in the education process, but also to a deeper ecological sensibility and orientation. What such a paradigm might look like is explored further in Parts C and D.

To help clarify the meaning of 'whole systems thinking' and address the problem of the narrow interpretation or use of systems approaches, as noted by critics quoted above, I use the words 'reinventing' and 'reinvesting' systems. Reinvention recognises - very importantly - that the systems view of the world is indeed a view, a metaphor, a representation, and often a tool; it is not reality itself; thus this view can be revised, changed and *expanded.* As reviewed briefly in the subsection above, such change in systems thinking has indeed been in progress. Whole systems thinking is a dynamic approximation, an abstraction, which I am suggesting, is a 'truer' – i.e. more adequate, and therefore, more useful - model than the still predominantly mechanistic paradigm which informs much of our individual and collective thinking.

My thesis is that the emerging view of whole systems thinking draws from, and could further draw from, at least four main sources (as noted in section A.3.3) which are elaborated in **Appendix I:**

1. the development of systems thinking and systems science, from the early 20th century onwards
2. ancient wisdom and indigenous worldviews
3. the organicist tradition in Western science and philosophy
4. holistic science, particularly complexity theory

In essence, the idea of 'system' is a metaphor, which may even be replaced by a better one in the future. One of the progenitors of the whole, organicist, sense of systems is Whitehead (introduced earlier in A.3.4), who described paradigms as a 'groove of abstractions' (Whitehead 1927). The question then, is whether a reinvented, expanded, deepened sense of systems allows us to climb out of such grooves (paradigms), and whether this sense of systems, as another set of abstractions, is a more complete if still ultimately limited way of comprehension.

'Reinvesting' means recognising and encompassing meaning and value within systems thinking. Whole systems thinking is not therefore just a practical tool, but a 'total' systems view, that does not seek to keep outside its boundary the affective world; and admits a more expansive and deeper reality than the dominant ontological view permits. It provides an alternative to what Norgaard (1994, 74) has described as:

> …our excessive reliance on particular metaphysical and epistemological premises which are inappropriate for understanding complex systems, especially systems with the 'understander' inside of them.

The 'understander inside' is a critical part of whole systems thinking, which recognises our participatory role in co-creating reality. But in using words like 'total' and 'whole' systems approaches, I mean to convey the importance of an expanded and integrative view, rather than their literal sense which in practice is impossible. As Wilber warns (1997, 59):

> We cannot make a statement about the whole of Reality, because any conceivable statement is itself merely part of that Reality.

This realisation stands in contrast to the modernist epistemology which holds that in principle everything is knowable, and therefore, by implication, can be controlled and managed.

Whole systems thinking subscribes to the possibility of what Flood (1999, 83) calls "learning within the unknowable". He goes on:

> Balancing mystery with mastery means living somewhere between the hopelessness of the belief that we are unable to understand anything and, at the other extreme, the naivety of the belief that we can know everything.

This implies a profound revision of some key assumptions, stemming from long-held traditions associated with the modern Western worldview. They may be stated as follows:

1.'To every problem, there's a solution'
(belief in the power of problem-solving approaches)
2. We can understand something by breaking it down into its component parts'
(believing a complex whole can be understood by looking at the detail)
3. 'The whole (of something) is no more than the sum of its parts'
(there are no emergent properties)
4. 'Most processes are linear and characterised by cause and effect'
(events and phenomena have a identifiable beginning and finishing point)
5. 'Most issues and events are fundamentally discrete or may be regarded as such, and may be dealt with adequately in a segregated way'
(most issues are essentially unrelated)
6. 'It is ethically acceptable to draw your circle of attention or concern quite tightly, as in "that's not my concern"'
(our system of concern is restricted - we do not need to look beyond our immediate concerns as an individual, a householder, a consumer, a businessman etc.)
7. 'Objectivity is both possible and necessary to understand issues'
(it is important to exclude our feelings and values in our analysis and judgement)
8. 'We can define or value something by distinguishing it from what it is not, or from its opposite'
(a belief that economics is separate from ecology, people are separate from nature, *facts are separate from values, etc – putting boundaries around that which we value)*

9. ‘We can understand things best through a rational response. Any other approach is irrational’
(we need to downplay our intuition and non-rational knowing)
10. ‘If we know what the state of something is now, we can usually predict future outcomes’
(a belief in certainty, prediction, and the possibility of control)

These ten assumptions can be re-stated as basic habits of thought or tendencies which characterise modernist thinking, in the same order and as follows:

1. problem-solving
2. analysis
3. reductionism
4. cause-effect
5. atomism
6. narrow boundaries
7. objectivism
8. dualism
9. rationalism
10. determinism

Whilst such words “sound abstract and remote, the concepts (they) represent have touched us at the centre of our being” (Zohar and Marshall 2000, 26). Importantly, each of these ten assumptions and habits of thought are questioned by second-order systems thinking and the ecological movement as a whole. From a systems point of view, it is well known that complex and living systems require a very different sort of intervention and relationship than mechanistic systems. It is this distinction which lies behind the emergence of ‘soft systems’ approaches, when it was discovered that ‘hard systems’ approaches, based on mechanical systems did not work when applied to complex systems (see Bell and Morse 1999, 109).

Brian Goodwin, (a former professor of biology at the Open University), in discussing environmental and health issues, clarifies this point (1999, 5).

> The new sciences of complexity suggest that (emergent problems) may arise because we are failing to grasp a basic property of the complex processes that are involved in maintaining healthy environments, healthy bodies and healthy communities. Those cannot be manipulated and controlled in the ways that work for mechanical systems such as cars, computers, radios, and television

> sets. Their complexity is such that we cannot predict the consequences of what appear to be scientifically reasonable actions…Commercial interests encourage the adoption of reductionist principles because they seem to promise control over complex systems…But (these) function in terms of emergent, holistic properties, that we are only beginning to understand; and they require us to adopt a different pattern of relationships from the manipulative, exploitative style of interaction that we have learned from our science of quantities.

The issue here is not only the nature of the problem involved - whether, using Ackoff's terms (1980) the problem is a contained 'difficulty' amenable to technical 'problem-solving' or a complex 'mess' which is not. At a deeper level the issue is the fundamental ontological metaphor that we employ: whether we see the world primarily in terms of mechanistic systems, or in terms of organic or living systems. This is a critical distinction.

- Keypoint: it is the inappropriate application of mechanistic systems thinking and approaches to non-linear and complex systems that compounds problems.

Here, I would include education, people, and environmental and sustainability issues as phenomena that can be distinguished as 'complex systems' and which require us to engage differently.

A summary of the difference between mechanistic and whole systems thiinking is suggested in the next table.

Table B.2: Suggested differences between 'hard' and whole systems thinking

Hard systems thinking (mechanistic)	**Whole systems thinking (ecological)**
Primarily a methodlogy or tool	Primarily a sensibility and worldview
Seeking an equilibrium or end state (goal)	Recognises dynamic learning process through self organisation
Objectivist	Realist / constructivist / participative
Intervention from outside system (observer)	Participation with / within system (actor)
Descriptive ('as is'); analytical emphasis	Metaphorical ('map'); normative emphasis
Systems models as ontologies	Systems models as epistemologies

Essentially 'neutral'	Ethical, with wholeness and sustainability at core
Problem-solving	Problematising/ 'situation improvement'
Primarily intellectual, rational	Also engaging non-rational thinking and experience
Often specialised, technical, expert-led	Accessible, participatory, welcoming multiple perspectives
Reductive methodology	Holistic methodology
Focussing on material reality	Admitting different realities
Ethos of control	Ethos of appreciation, self-organisation, emergence
More a part of reductive than of ecological paradigm	Part of ecological paradigm
Learning for controlling change	Learning as change
Learning about systems	Transformative learning as systemic development and change
Purposive	Purposeful

Interestingly, soft systems methodology - which developed as a necessary response to hard systems thinking - may be seen as occupying a space somewhere between these modes, but with more in common with the right hand than the left.

In terms of the 'thinking habits' suggested above, a whole systems/ecological approach suggests a necessary shift of emphasis from the dominant descriptors (on the left) towards a new set of bases for thought (on the right), as follows:

Table B.3 Shifting our modes of thought

Dominant modes of thought	**Holistic / ecological modes of thought**
Problem-solving	Appreciation / problematising / situation improvement
Analysis	Synthesis
Reductionism	Holism
Closed cause-effect	Multiple influences through time and space
Atomism / segregative	Integrative

Narrow boundaries	Extension of boundaries
Objectivism	Critical subjectivity
Dualism	Monism / pluralism / duality
Rationalism	Rational / non-rational ways of knowing
Determinism	Uncertainty, tolerance of ambiguity

Again, it is important to state that the ecological worldview does not consign the left hand modes to history, even if this were possible. Instead, we are - in ecological thought - more reflexively aware of them, allowing their *appropriate* employment within an *extended* epistemology.

The essential distinguishing characteristics of the emerging sense of 'whole systems thinking' (noted briefly above in A.2.2) can be summarised thus - that it:

- articulates an ecological, participative worldview or *epistemology*
- recognises a co-evolutionary *ontology*
- manifests a systemic, integrative *methodology*

Importantly, this *expanded* sense of systems, building on sources such as ecological philosophy and complexity theory, stresses the idea of interrelating *self-organising systems* as an ontological description, as a theory of learning, and a normative orientation which underpins self-realisation, radical democracy and ecological integrity, and what might be termed a creative, non-deterministic evolutionary process. This contrasts with the more objectivist, mechanistic systems approach which stresses separation, control, problem-solving, linearity, determinism, a transmissive conception of learning, and which stays within the limits of first-order change - and therefore does not recognise the need for transformative change in relation to the sustainability transition.

This new sense of systems then, implies a changed epistemology, ontology, and methodology, where *wholeness* is the 'guiding star' of perception, conception, and practice. I would also add that it implies a teleological and spiritual dimension, through which we might regain our sense of participation with the rest of creation that was lost through the dominance of mechanism, materialism and dualism in our thinking and psyche (Berman 1981).

The bases and nature of whole systems thinking are explored in more detail in **Appendix I,** and this is summarised in the triadic model of paradigm and of human knowing/experience (as introduced above in A.3.1). The implications for theory and practice in education are the subject of Parts C and D, but prior to that, I now examine the influence of changing worldviews on education.

Summary

In section 1 above, I have looked at the nature of the postmodern ecological worldview, and suggested that its emergence, albeit fragile, indicates evidence of deep cultural change and learning. In section 2, I discussed further the nature of whole systems thinking (WST), and actual and potential movement towards WST in the systems field. In the final two sections of Part B, I look at related change in the field of education. The focus is how far education and environmental education are influenced by the context of changing worldviews, and how far they are in a position to assist transformative learning towards ecological thinking. This sets a context for discussion of paradigm theory in education in Part C, and the possibility of paradigm change through a whole systems approach.

Following nesting systems logic, the level of 'education as a whole' is examined at first (section 3), and then the sublevel of environmental education, (in section 4).

3 EDUCATION AND CHANGE

In this section 3, I reiterate and further explain the critical distinction between 'education for change' and 'education in change', arguing that the possibility of transformative education depends on the latter, that is, on change in educational thinking and policy. I then look at the 'ecology' of education, seen as a subsystem of society, at the effect of restructuring on education, and how far this has limited the transformative potential of education as a change agent.

Before proceeding further, I will take stock of progress to this point.

Box B.5 Taking stock

The Thesis attempts to build towards a theory - or set of theories - which (reiterated from A.1.1):

- help explain the lack of fundamental change in educational paradigm, (that is, the relative inability of the prevailing educational culture as a system of thought to change through learning),
- help construct a theory of transformation that might assist such fundamental change - which would in turn…
- enable a transformed educational paradigm to support a quality of transformative learning necessary to societal movement towards sustainability.

The foundational ideas and models outlined so far in Part A and Part B, which build towards such a theory, include:

- the idea of epistemological 'error' or inadequacy
- learning levels and orders of change
- systemic levels of knowing
- the 'sustainability transition'
- paradigm theory and the three dimensions of paradigms
- modernism, postmodernism, and revisionary postmodernism
- the nature of the ecological worldview
- whole systems thinking

Additional theories/models, outlined below, include:

- education 'in' change and education 'for' change (B.3.1)
- the 'ecology' of educational systems (B.3.2)
- intrinsic and instrumental values in education (B.3.3)

3.1 Education 'in' and 'for' change

At this point, I want to reiterate and elaborate the important distinction made in the Preamble and Part A.3.1 between 'change in education', and 'education for change'. Practitioners and policymakers in environmental and sustainability education often focus on the latter, and thereby stress the need to change *provision* in education, particularly curriculum, to develop an appropriate 'education for change'. I argue, rather, that prior attention needs to be given to power of the underlying *paradigm* which shapes the purposes, policy and provision that are dominant and the changes that are

deemed possible. Hence, the need, as stated above for 'learning *within* education' or change in education, as a necessary precursor to adequate learning *through* education or education for change.

Education for change focuses on the role of education in bringing about change in the person, group or society. It is about purposeful change sought or achieved through educational practice. *Education in change* (or change in education) refers to change in educational rationale, policy, theory and practice that affect and may facilitate (or hinder) education for change. Having made the distinction between these categories of change, we can then make a further distinction between fundamental methodologies, which might apply to either types of educational change, as follows*:*

Table B.3: Types of educational change and methodology

	TRANSMISSIVE Methodology	**TRANSFORMATIVE** Methodology
EDUCATION *FOR* CHANGE (practice)	INSTRUCTIVE	CONSTRUCTIVE
CHANGE *IN* EDUCATION (policy)	IMPOSED	PARTICIPATIVE

I would argue, that essentially, all education can be seen as being expressed through either a broadly 'transmissive' or 'transformative' methodology:

- Within a transmissive methodology, 'education for change' is *instructive* - i.e. associated with the transfer of information, while 'change in education' tends to be imposed through direction.
- Within a transformative methodology, 'education for change' is *constructive* - i.e. engages the learner in constructing and owning meaning, while 'change in education' is participative and collaborative.

'Imposed' and 'participative' describe the style of policy change and management, and apply to any level of the education system. Importantly, 'education for change' and 'change in education' are necessary to each other: the former cannot be achieved

without sympathetic change in the latter, and vice-versa. A further point here is that in practice, both categories of change are usually matched, reflecting either a transmissive or transformative style.

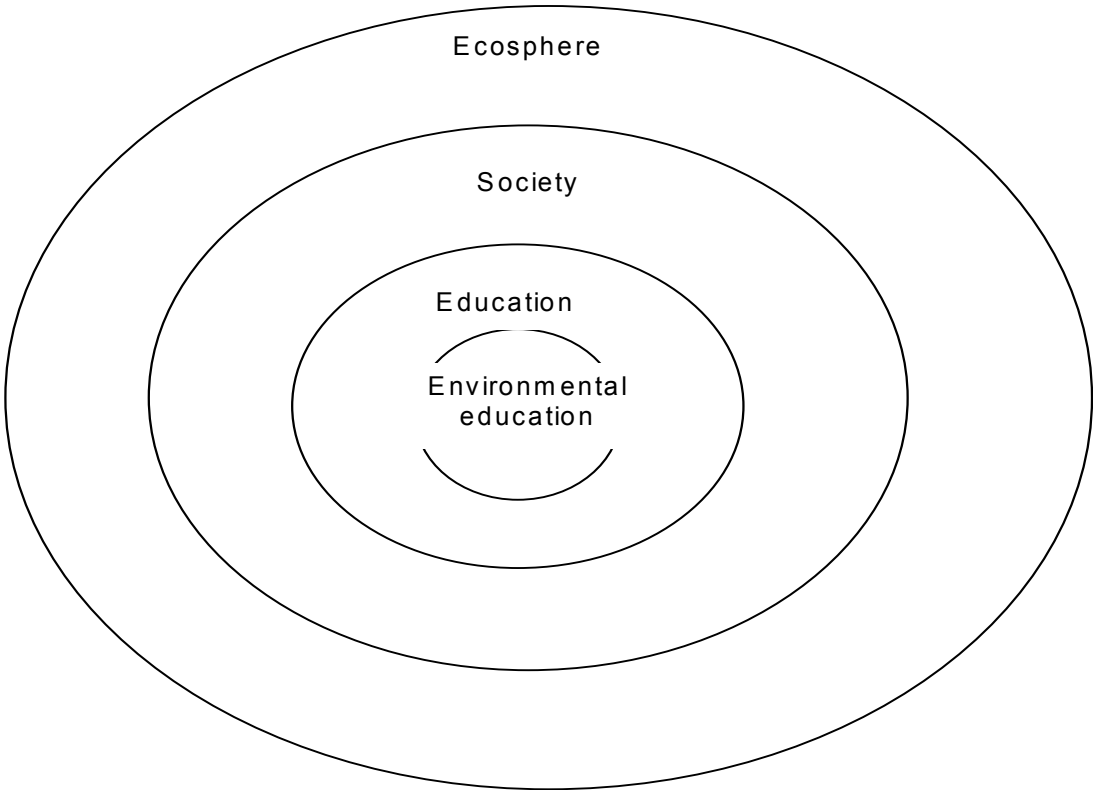
My argument, which is developed in detail below and in subsequent Parts, is that an ecological, holistic 'sustainable education' paradigm is essentially transformative, constructive, and participatory/democratic. By contrast, the dominant model is fundamentally transmissive (or informative), instructive, and non-participatory or less democratic (Sterling 1996b, Sterling 2001). Of course, reality is not as simple as this, and - following the paradigmatic argument above - there is an important point about the transformative subsuming rather than negating the transmissive orientation in any sustainable education paradigm. But for now, the model seeks to clarify basic patterns and orientations, and these are illustrated further, below.

3.2 The 'ecology' of educational systems

Another useful model employs (again) the concept of nesting systems. Thus we can describe an 'ecology' of educational systems to clarify the existence of different interacting system levels (Banathy 1992). Clearly, it is possible to regard to identify a set of related components including policies, institutions, curricula, actors *et cetera* as 'an educational system', and further identify that system as a *subsystem* of wider society: on the grounds that it is organised by, financed by, and mandated by this society. It is predominantly shaped and oriented by the needs, policies, values and norms of the social context which it serves - rather than the other way round.

At a lower system level, environmental education or other movements for educational change can be seen as subsystems of the larger or mainstream formal educational system: they are manifested and operate within this larger political, cultural, and organisational context, which influences both discourse and practice. These relationships can be simply represented, as in Diagram B.5.

Diagram B.5: The ecology of education systems



If we now jump up a step in the hierarchy, the larger socio-economic and cultural systems may be regarded as subsystems of the planet as a whole, in the sense that they are entirely dependent upon the functioning of the biophysical world. Indeed, as Meadows et al. (1992), Daly (1996), Clayton and Radcliffe (1996), Brown (2001) and The Natural Step programme point out, socio-economic systems must be regarded as subsystems of the encompassing biophysical or ecospheric system, and the fact that the economic system is often seen as independent of or encompassing the biophysical system is partly the root cause of our current crisis. This is a critical point to do with where and how boundaries to our individual, social and corporate concerns are seen and drawn, and may be said to be a fundamental starting point for most ecological thinking.

This model is a simple one - Banathy (1992) for example, distinguishes six levels of systems, which substantiates the point that the distinction of system boundaries depend on the observer. For my purposes, I think the four levels distinguished here are sufficient and helpful. A number of ideas are suggested by this model, including that:

- in the dynamics of the three levels of the human systems, top-down influence (which seeks to integrate the levels below) is stronger in sum than bottom-up influences (which seek to affect the higher levels)
- any 'education for change' movement which seeks to affect society, also needs to look at change in the educational context in which it operates, that is, also pay attention to the next system level, as well as the higher contextual level.
- education for change is never a one-way linear process.

This model indicates that the central question that has been occupying environmental educators for decades is misplaced or at least, over-optimistic: 'how can environmental education change people's regard for and behaviour towards the environment?' This instrumental and linear idea (which still retains currency although much less so than in the 1970s and 80s), that more environmental education would change people, and thereby would change society, ignores at least three realities:

- radical education for change is often outweighed by the larger educational system which enacts vocational and socialising roles and purposes, and can both constrain and 'cancel out' such educational endeavour,
- the larger-still social system affects and shapes the educational system more than the other way round, although they are in a recursive relationship, and,
- in an age of mass communication, the socio-cultural milieu arguably affects people and influences values more than formal education programmes do.

These dynamics do not mean that environmental education or other education for change movements cannot be effective, but that they are always limited by factors beyond their influence.

I have suggested (Sterling 2000a), and above in Part A, that the systems perspective - which recognises recursive rather than linear relationships - encourages a change of question, to 'How can education and society change together in a *mutually affirming* way, towards more *sustainable patterns* for both?' The challenge here is to work for a relationship of positive feedback, where changes towards sustainability in wider society support what I have called a paradigm of 'sustainable education' (Sterling 2001), which support changes in wider society, and so on. As stated in Part A.1.1, this takes us from a model of education as one of social reproduction and maintenance, towards a vision of continuous re-creation or co-evolution where both education and society are engaged in a relationship of mutual transformation (Banathy 1991,129). I believe

environmental and sustainability education has an important role in catalysing this process.

The possibility of such whole system paradigm change is explored in Part C. At this point, however, it is necessary to look again at recent and current change in educational policy, thinking and practice and make an initial assessment as to how far ecological thinking is informing, or is constrained by such change. (This builds on the introductory discussion in A.3.6).

3.3 The restructuring of education in the postmodern world

Since the mid-eighties, educational systems in Western societies have undergone 'restructuring', informed by neo-liberal and neo-conservative values and ideas. This process, as Torres points out, involves altering the "purposes, assumptions and methods of school systems rather than merely transforming the efficiency of existing systems" (Torres, 446 in Marshall and Peters 1999). The shift of the centre-ground has been from neo-classical and liberal views of education - that is, the academic and individualist views which have informed educational debate and practice for much of the last century - towards neo-liberal and neo-conservative views of the role and nature of education.

A very managerialist, instrumental view of education has come to dominate, modelled on economic change and the perceived 'demands' of a globalised economy and increasingly, globalised culture. This change is not peculiar to the field of education, but 'marketisation' and 'modernisation' has infiltrated virtually all areas of public life including sport, health, the penal system, policing and local government (Marshall and Peters 1999). A number of writers suggest the change in education is well represented by a changing language. Robertson (in Goodson and Hargreaves 1996, 26) for example, writes:

> Notions such as inputs, equity, centralized bureaucracy, mass education, seniority and unionization which defined post-world war mass schooling have been replaced by a new language: outputs, performance, added-value, choice, markets, quality, competencies, excellence, flexibility, deregulation, and school-business partnerships.

Further, a new language relating to the actors in education has become commonplace, inducing a changed personal and professional perception of identity, and defining a new set of relationships which have undermined older understandings and tacit

agreements. Thus “teachers are constructed as ‘providers’, principals as ‘managers’, parents as ‘employers’, and students as ‘consumers’” (Smyth and Shacklock 1998, 97).

It is important to review the main features of this shift, not least as the change is exerting a profound effect on educational thinking and practice, arguably to the exclusion of other educational models. A further reason for this inquiry is that environmental education and education for sustainability discourse tends to weigh the relative merits of educational paradigms - such as positivism, interpretivism, critical theory, and post-structuralism - with little or no reference to the nature of the dominant operational cultural and educational metaparadigm within which these orientations fare more or less strongly. This appears a curious omission, where educational movements that seek to affect social change often do not address directly the overriding context which they seek to influence. This argument - which relates to the ‘ecology of educational systems’ model above, and the influence of paradigms - is touched on again in B.4.1 below, and is revisited in greater depth in Parts C and D.

Further, this inquiry is made because some aspects of the neo-liberal/neo-conservative model of education appear at first glance to support more holistic or systemic models of education and learning, for example, with regard to encouraging life-long learning and decentralised self-management. However, closer examination shows that significant differences remain - although I will suggest that at least some of the new changes perhaps open doors for more systemic approaches. Overall, however, the currently dominant educational model - seen from my interpretation of a systemic view - is largely a dysfunctional and inappropriate model for our times. Indeed, in many respects, I would argue that it is headed in the wrong direction, away from what I have termed ‘sustainable education’: thus it is possible to contrast the mechanistic paradigm underlying the neo-liberal conception of education against an ecological educational paradigm (Sterling 2001). (This discussion is also revisited in more detail in Part C).

Whilst this is a brief examination, I will try to resist the temptation to oversimplify. Certainly, it is not possible to isolate a single factor that has changed the dominant educational paradigm in the last twenty or so years. Political, economic, cultural and intellectual change all have played some part, leading to a current situation of some complexity. These changes can be very briefly summarised thus:

Political

A shift of the locus of political thinking from liberal and social democracy, and the Keynesian welfare state, towards the Right thus giving neo-liberal and neo-conservative thinking ascendancy.

Economic

A shift from 'Fordist' to 'post-Fordist' economic organisation, or from 'organised' capitalism to 'disorganised' capitalism, and global 'economic restructuring' which favours 'free' movement of capital, investment and goods, and seeks a supply of 'human capital' with flexible skills.

Cultural

Late modernism and postmodernism, implying preference for plurality and diversity, but also leading to individualism and moral relativism.

Intellectual

Poststructuralism - rejection of all 'grand narratives'. The dimensions of deconstructive postmodernism and poststructuralism add to the paradox of our current situation. Whilst they possess the intellectual argument to oppose modernism and central organising principles, and instead celebrate diversity and multiple realities, they offer little critique of a monocultural and homogenising globalised economy, and no constructive alternative. Further, the idea of a 'sustainable future', central to sustainability education movements, is undermined.

The combined effect of these changes have been widespread and profound. In education, changes have affected everything from the purposes of education, to curriculum, funding, management, the role of schools and teachers, and even the overall ethos of education. The emphasis has shifted from *educational* values to do with developing potential and autonomy in students, and *social* values relating to equality of opportunity and social cohesion, towards *economic* values which education is required to serve much more closely. Whilst education has always had some economic function, in the recent past this has been balanced through it being seen as one of several co-existing functions. Recently however, as Marshall and Peters (1999, xvii), paraphrasing Lyotard, suggest, education:

> …has been turned into a strategic factor in the efficiency of national economic policies…education is no longer concerned with the pursuit of ideals such as that of personal autonomy, emancipation or leadership…but instead with the

> means, techniques or skills that both contribute to the efficient operation of the state in the world market and contribute to the maintenance of an internal cohesion and legitimation of the state.

Or as Maguire and Ball suggest (1994, 14), "…schooling is no longer being articulated as a public service but rather as a state regulated private good".

However, the new model cannot be simply characterised. In 1990, when Thatcherism was making its mark on British education, Ball (1990, 213) wrote:

> The neo-liberal influence emphasises an orientation to the future, constant adaptation to new circumstances and an absence of state controls; the neo-conservative influence stresses an orientation to the past, traditional values and collective loyalties. Education is thus contested in terms of its role in both restoring authority and responding to the contemporary logic of capitalist development. The internal culture and ideological dynamics of these struggles serve to underline Williams (1962) point that 'An educational curriculum…expresses a compromise between an inherited selection of interests and the emphasis of new interests'. The pattern and outcome of these compromises are different at different historical moments.

The current compromise under 'Blairism' has arguably shifted towards the neo-liberal, but neo-conservative elements remain. Meanwhile, in common with patterns of change in other Western education systems (Marshall and Peters 1999), long-established liberal ideas of the purposes of education have been overshadowed. Australian academics Smyth and Shacklock (1998, 11) for example, argue:

> Schools as sites of comprehensive intellectual growth, as places that foster and value the wider social good compared with self-interested individualism, and that sustain and maintain local discourses about social justice, are decidedly unfashionable at the moment and are tending to be relegated to the interstices, the cracks and the crevices of discussion, rather than firing the wider public imagination of what schools exist for.

Whilst many educators have reeled at the effects of the managerialist revolution in education, it is doubtful that it should be seen as constituting a "new educational paradigm". Smyth and Shacklock (1998, 135) opine:

> It is not clear that the changes currently being inflicted upon schools actually amount to a paradigm shift - but they certainly represent the replacement of a

> set of discourses about the educational and social utility of schooling, to ones that are driven by narrow vocationalist, managerial and economistic agenda.

Certainly, taking the effect as a whole, the change is 'new' and many aspects would be unrecognisable to teachers and educators some twenty years ago. But if we take given definitions of paradigm visited elsewhere in this Thesis such as Capra's (1986), "a society's dominant belief structure that organizes the way people perceive and interpret the functioning of the world around them" - it more likely represents a subparadigm located within the project of late modernity, one organised around what might be termed economism. This educational 'subparadigm' is still underpinned by a deeper paradigm embracing positivistic, behaviouristic and technocratic thinking, and founded on a mechanistic view of the world.

The analogy with the factory is telling: children and qualifications are produced, there are precise goals and targets, the curriculum provides directives for each stage of production, teachers are technicians and are therefore substitutable, there is uniform monitoring, 'quality control' and standardisation through testing and inspection, and so on (Smyth and Shacklock 1998, 49). And I would add, neither teachers nor the taught are really required to think critically or creatively.

At the same time, however, the move to 'modernise' and create 'the learning society' has led to a certain opening up of the educational landscape, and arguably, some aspects of these have positive potential seen from a sustainability perspective. These changes include more emphasis on:

- learning than teaching
- life skills and 'life-long learning'
- hybrid and multidisciplinary subjects
- information technology as learning and 'delivery' tool
- distance and open learning
- 'the learning organisation', and
- recognition of the transitory nature of much knowledge

(Jarvis, Holford and Griffin 1998, Bentley 1998)

Meantime there have been a number of reports that seek to speed up this process of change (Bayliss 1999, Bentley 1998). The discourse is about the need for more

flexibility in learning and schooling, about getting ready for the information revolution, about life-long learning, about learning to learn, and so on. The current changes are largely about moving education suited to the modern industrial age to one appropriate to the postmodern information age. As in many ways formal education is still largely based on the 19th century factory model, some of these changes might appear welcome. But without asking deeper questions concerning *ethos*, and posing the sustainability context, they may exacerbate rather than contribute to the sustainability issue. Ideas of 'the knowledge society', 'the information economy', 'the information society', and 'the learning society' often hide questions about what sorts of knowledge, controlled by whom, for whom, and for what purposes.

- Keypoint: In such emphases as the 'knowledge society' and 'learning society', there is an assumption that learning is self-evidently a good in itself: whereas from an ecological point of view, the purpose and context of learning often implies an ethical dimension.

I can, for example, equally learn how to rob a bank, as look after sick children. Without an ecological understanding, there is some danger of creating post-modern learning institutions, whose graduates are able to exploit others and the environment more efficiently and effectively than their predecessors.

In other words, we can argue that the changes that the late-modernist agenda have wrought, however far-reaching they appear to their progenitors or bearers, are largely within the bounds of the existing paradigm: what Clark (1989, 236) calls "change within changelessness" (as noted above in B.1.3), that is, first order change. This, as noted above, is only concerned with *doing things better* i.e. with efficiency, efficacy and improvement. But, as Ackoff has said, "It is better to do the right thing wrong, than the wrong thing better and better" (1995), the latter being a danger with first order change.

Thus, we can make the following distinctions (based on Banathy 1991):

Box B.6: Orders of change in educational systems

Making adjustments in the existing system (first order change)

Education and school/college improvement - doing more of the same, but 'doing it better'. Emphasis on efficiency.

Education restructuring - re-organising components and responsibilities in the education system. Emphasis on effectiveness.

Changing the educational paradigm (second/third order change)
Redesign of education system and institutions - achieving awareness of the nature and limits of prevailing education paradigm, and re-thinking, on a participative basis, whole systems according to insights of systems thinking, ecological democracy and complexity theory.

As noted in B.1.3 above, second order and third order systemic change are concerned respectively with *doing better things,* and with *seeing things differently.* Thus, Weil (1999, 171) argues for a shift away from "systematic control" which is characteristic of the neo-liberal revolution, to "systemic learning and inquiry" which (in my terms) represents an ecological change model.

The former approach reflects mechanistic beliefs in determinism, and predictability, and therefore the possibility of control. This is manifested, for example, in the emphasis on outcomes and standards - if we know what the inputs are and process is, we can say with certainty what the outputs should be, and can judge success and failure on the basis of how far predetermined outputs are achieved. Viewed this way, the concern with standards is arguably more about *standardisation* than quality of learning.

- Keypoint: The mechanistic way of thinking about education and learning has become part of the shared psyche and culture, ousting previous and perhaps more valid and truthful ways of perceiving education and learning, and narrowing perceptions of what constitutes worthwhile knowledge and enquiry.

"Outcomes rhetoric", according to Smyth and Shacklock (1998, 49), "has apparently become the discourse of a normal and natural approach to the provision of education, an approach which has largely reduced, marginalized and rendered other discourses irrelevant."

In terms of the analogy I suggested above (section A.3.3) it seems, is an example of the imposition of a 'square peg consciousness' on a 'round reality'. The non-recognition by policy makers that humans and human systems are characterised by complexity, emergence and difference, is a major flaw. The idea of emergence is a crucial one

here. If complex systems are not seen from a whole systems perspective and treated with a commensurate awareness, then emergent properties are likely to be negative rather than positive. Emergence is sometimes referred to as 'surprise', that is, what happens beyond the scope of the intention or goal. The negative emergent properties apparent in the UK are now less of a genuine surprise, as they are well known and documented. But it would be interesting to know how far policy makers associate negative emergent properties (such as those in the second list block below) with recent policies. The following are indicated by Smyth and Shacklock 1998, and I have arranged them into 'policies' and 'effects' in two blocks as follows:

Policies

- a narrowing of what counts as achievement to that which can be measured
- emphasis on targets and performance indicators
- a shift towards traditional pedagogies
- a promotion of competition rather than collaboration within and between institutions

Effects

- intensification of teachers' and lecturers' work
- stress amongst teachers and a feeling of being 'squeezed dry'
- a breakdown of a sense of sociability and collegiality within institutions
- a general decline in vitality and creativity of teaching.

Bassnett, a university pro-vice chancellor, argues strongly that the obsession with 'quality' is leading to the opposite, a loss of quality if a wider set of quality criteria is taken into account. The amount of energy and time that goes into bureaucracy and administration to "prove you have demonstrable quality learning outputs" she argues, has led to loss of good teaching and research, loss of tutor-student contact and the growth "a whole new cadre of university bureaucrats living comfortably off the quality industry".

> What is happening in higher education is a dumbing down of the whole system, under the pretext of improving quality for all.
> (Bassnett 1998, ii)

Laurillard, of the Open University in the UK, points out that none of the assessment processes that HE now has to follow enable the HE sector to *itself learn:* "they merely describe, and at a level of description that does nothing to help us understand whether we are actually serving our students better" (Laurillard 1999, 119). Yet the insistence

on measuring, on accountability is everywhere in formal education systems. Tate (a former chief executive of the Qualifications and Curriculum Authority) states, “As a society we are preoccupied with assessment. Never before have so many been tested, for so long, and under such scrutiny” (Tate 2000,3).

There appears to an increasing irony in this whole story. Whilst the restructuring of education has it seems been driven by an economic rationale, the business world that education now mimics has, in some quarters at least, moved on. At the same time, there is criticism that the performance-driven model foisted onto education has driven out the space for developing the creativity, and self-reliance that such business quarters actually require educational systems to nurture (Jupp, Fairley and Bentley, 2001).

The application of complexity theory - which is about how complex natural and human systems work - is leading to a new language in business management which is questioning the validity of long term planning and outcomes, of heavy top-down management and control. The emerging language is about seeing organisations as living machines, or as organic wholes, and the application of new thinking from the complexity sciences is displacing mechanistic metaphors. Roberts (1998, 5), in an issue of a newsletter of a leading management training institute comments on the implications of complexity theory:

> Leaders and managers should aim to develop conditions in the organisation which allow self-organising behaviour to flourish. This means creating adaptive organisations with flexible structures, skills, processes and information flows. Instead of hierarchically imposing change, managers need to unleash the potential for change.

What is emerging here is more emphasis on genuine participation and collaboration, flexibility, trust, inclusivity, diversity, creativity, and the role of local and personal knowledge as inherent to the learning process. Instead of an ethos of manipulation and control, some leading businesses are recognising the value of ‘capacity building’, and facilitating and nurturing self-organisation in the individual and community as a necessary basis for ‘systems health’ and sustainability. What these businesses are recognising is that the power of emergent properties can be used to generate what are called in systems jargon ‘positive synergies’, where positive and interacting spin-offs arise.

This is much closer to the whole systems perspective which recognises that whole systems health depends upon the proper and dynamic balance between *autonomy* and *integration* at all levels of the system. Yet, in the neo-liberal and neo-conservative models of education, integration and conformity are intentionally given primacy, while autonomy is undermined. As Torres remarks (446, in Marshall and Peters 1999), “A central component of the neoconservative restoration is a critique of the liberal notion of autonomy and its implications for classroom practices. Autonomy is interpreted as lack of accountability”.

I will now suggest and summarise some criticisms of the neo-liberal, managerialist model of education from a whole systems point of view. Thus it tends to:

- have a limited view of the whole person or of personhood
- ignore social learning and undervalue the social benefits of education
- promote a simple ‘first order’ notion of learning
- be essentially mechanistic
- be undemocratic and overemphasize control and competition
- be monocultural and homogenising
- have little sense of promoting community or mutual wellbeing
- distort the allocation of resources - rich schools/institutions get richer and brighter students and poor schools get poorer and less bright children (Olssen 342, 1996)
- be controlling rather than empowering despite the decentralisation of immediate management
- have little sense of the intrinsic value of education or the qualitative difference of the nature of learning (compared to other human activities) as an essential and intrinsic part of being human
- be concerned with universals and uniformity, and display insufficient respect for local or individual difference or local or personal knowledge
- afford little room for spontaneity, imagination, creativity or aesthetics
- replace full participation, engagement and voluntarism amongst teachers and learners with a contract mentality
- ignore process values such as nurturing, encouraging and trusting
- engender more fear than trust and more dysfunctionality than wellbeing.

In sum, the mechanistic paradigm which is now in control of education is inappropriate because it does not recognise that the process and quality of education and learning is

fundamentally concerned with relationships rather than 'things', products or commodities. As Smyth and Shacklock state (1998, 201):

> Teaching is being remade by global economic forces which have little to do with the *relational* world of teaching and learning inhabited by children and teachers. (my italics)

The fundamental difference of orientation is partly explained by distinguishing *methodologies* (see Table B.3 above) and partly also, by distinguishing intrinsic values from instrumental values in education. This is outlined in Box B.7 below.

Box B.7: Intrinsic and instrumental values in education

In understanding underlying educational values a clarifying distinction can be made between *intrinsic* values, and *instrumental* values. Educational orientations stressing *intrinsic* values view education as an end and a good in itself, as having inherent value, purpose and meaning. There is a strong sense of the question, 'what is the nature of education?' In this orientation, the end use to which the 'educated person' put his/her education is a secondary consideration, but there is a belief that a well-rounded education will only have beneficial social consequences. This was exemplified by the child-centred and 'progressive' movement in education that was at its zenith in Britain in the 1960s.

On the other hand, the *instrumental* stance values education as a means to an end, whether this be to assist international competitiveness, or combat drugs, or racism, or indeed, promote peace or environmental quality, for example. Hence any phrase conjoining 'education' and 'for' usually implies an element of instrumentalism. There are many of them, as education is so often seen as the universal answer to problems. Thus, education 'for literacy', 'for health', 'for development', and even 'for the environment', is seeking some sort change in the individual or in society through education.

This is an important distinction, because there is a tension in educational thinking - and certainly in sustainability education - between views of education that tend to focus on one orientation or the other (rather than both). So an instrumental view of education tends to stress *purpose* and product, that is, outcomes and 'effectiveness'. It is concerned more with 'what education is for', rather than the nature of education. The intrinsic view however stresses *process* - the quality of experience of teaching and

learning, and is primarily concerned with 'what education is' rather than what it might eventually lead to or influence.

- Keypoint: Sustainability is essentially about integrative and relational thinking and action, and requires a synergy between the intrinsic and instrumental values.

However, there is a real tension in sustainability education between instrumental and process views of education, echoing the realism-idealism tension discussed above, and this is explored in more detail in Part D.

The restructuring of education helps explain the limited response education as a whole has made to the challenge of sustainability. This is introduced in the next subsection, and discussed in more detail in Part C.

3.4 The limits to education as an instrument for sustainable development

As noted above in A.1.1, since the UN Stockholm conference of 1972, numerous international statements and mandates have pointed to the key role of education as a change agent, from creating "new patterns of behaviour of individuals, groups and society as a whole towards the environment" (a goal of the Tbilisi intergovernmental conference, UNESCO 1978) to being "critical for promoting sustainable development and improving the capacity of the people to address environment and development issues" (Chapter 36, UNCED 1992). Agenda 21 Chapter 36 talks of the need to 'reorient' education towards sustainable development (UNCED 1992). The Brundtland Report of 1987, which gave rise to the 1992 Earth Summit, called for a "vast campaign of education, debate and public participation (which)...must start now if sustainable human progress is to be achieved" (WCED 1987, xiv).

Post the seminal Tbilisi conference, what was new about the later calls, was that they were not specifically about improving 'environmental education' whilst wider educational policy and practice went on unchanged, but concerned the redirection of *education as a whole.* Education as a whole was seen as an instrument to help assure sustainable development. Unsurprisingly perhaps, the response has been very limited. A report to the Commission on Sustainable Development, charged with monitoring progress on the implementation of Agenda 21, indicated that the major work was still to be done (UNESCO Secretary-General 2000), and the same conclusion was reached in a report for the 2002 World Summit on Sustainable Development (UNESCO, 2002) held in Johannesburg.

On another front, concern for ‘education for all’ (EFA), that is, universal provision of basic education, which is seen by UNESCO as a basic right, is also frustrated. Arguably, EFA is a fundamental part of education for sustainable development as most development studies show a link between quality of life and basic education. Yet, the goal of the UNESCO Jomtien conference of 1990 on Education for All (EFA) which promised basic education for all by 2000, remains far from being met (UNESCO, 2000). As the Dakar EFA conference concluded in 2000, “Without accelerated progress towards education for all, national and internationally agreed targets for poverty reduction will be missed, and inequalities between countries and within societies will widen” (WEF 2000).

There is a crisis here, and a major reason seems to be that member states are less interested in ‘education for change’ of this sort, but rather of a different kind, relating to the global economy. As the UNESCO Director-General suggested (Matsuura 2000), following the April 2000 World Education Forum meeting, “education for all has often been seen as a burden by governments trying to adjust to the demands of global competition”. In other words perhaps, the instrumentalist view of education critiqued above, through which policymakers deem education as critical to immediate survival in a globalised economy, has more importance than an alternative instrumentalist view, being education for long-term sustainable development. Thus, in assessing how far education as a whole has responded to the challenge and discourse of sustainability, there is not a great deal that can be said because the response has been weak and patchy (Smyth, 2002).

A further reason why educational systems across the globe have hardly responded to the challenge of reorientation towards sustainability or EFA, relates to my distinction above: discussion tends to focus on ‘education for change’ rather than on changes in education that would be necessary for educational practice to fulfil the international rhetoric. Certainly, there has not been much discussion about the limits of a solely instrumental view of education - whether this is geared towards the globalised economy or towards sustainability. With respect to the latter, certainly many environmental educators have seen the international rhetoric as a mandate to push education for sustainability or education for sustainable development, and this has attracted a fair share of criticism from those who may be said to espouse intrinsic educational values above instrumental educational values (Jickling 1992, Jickling and Spork 1998). (This debate is further reviewed in Part D.)

What has been largely missing in all this is an extensive and fundamental discussion about the kind of education that 21st century conditions require, whether a changed educational paradigm is required, clarity about the basis of such a paradigm, and also a strategic sense of how progress towards such a vision could be made, bearing in mind the power of the prevailing social and educational paradigms. In other words, whole systems thinking is needed, I would argue, about the nature and purpose of a reoriented education, and about how systemic change throughout all levels of educational systems might be brought about. This Thesis is, of course, attempting to contribute to this thinking, and models and ideas are outlined, reiterated and developed as the argument is gradually woven.

What we can conclude from this subsection and B.3.3 above, is that mainstream education is now largely bound within what is now a late modern/postmodern paradigm which has limited ability to address sustainability issues let alone move towards a more sustainable educational paradigm. It can be characterised by such keywords as: technocentric, instrumentalist, reductionist, managerialist, and globalised. Orr (in Sterling 2001, 8), in his characteristically forthright style, suggests:

> The upshot is that we must take education back from those who intend it to be centralized, homogenized, standardized, technologized, and industrialized.

This is easier said than done of course, but I argue that the need now is to shift attention from the subsystem level of 'adjectival educations' interested in 'education for change' (such 'environmental education', 'development education, 'human rights education' and so on), towards the articulation of an alternative post-modern ecological educational paradigm. This is what I have called 'sustainable education'.

The inertia in the mainstream does not mean there can be no movement in educational thinking and practice, or no calls for change, but most of this is arguably 'first order change' (Clark's "change within changelessness") as reviewed in B.3.3 above. But other calls for change appear to be inspired by second order change or third order positions, deeper analyses which I would say are resonant with 'sustainable education', and it is these which the next subsection reviews briefly.

3.5 Calls for change in education

Beyond the many voices calling for the inclusion of some special interest in education - be it health, sex, drugs, international understanding, peace and conflict resolution,

human rights, economic understanding, development, citizenship, moral development, and so on - including it must be said, environment - there are some fewer voices which seek a deeper reorientation, or indeed transformation of education. These voices seek not an 'add on' to the curriculum but a shift in educational culture. A few are briefly reviewed here.

Amongst the most prestigious was UNESCO's International Commission on Education for the 21st Century, which was chaired by Jacques Delors (Delors, 1996). Their report took a holistic and humanistic view of education. In particular, the report proposed four pillars as the foundations of education and life-long learning. These are in sum:

- learning to live together
- learning to know
- learning to do
- learning to be

What the Delors report failed to do - which is not surprising given its mainstream positioning - is critique the values and ideas of the prevailing managerialism that constrain the realisation of the orientation they favour. Other writers espouse an holistic and humanistic orientation in education, but also go further to critique, and/or contrast this orientation with, the dominant operational paradigm. These include, Beare and Slaughter (1993), Slaughter (1995), Hutchinson (1996), King and Schneider (1992), O'Sullivan (1999).

Whilst these writers come from variously 'peace', 'futures', and 'environmental' orientations, all advance an holistic vision of education. A further critical base which is reviewed, for example on the London South Bank University MSc where I teach, is that of critical pedagogy and development, and writers here include those such as Freire (1972), Fals-Borda (1991), and Chambers (1997). Interestingly, the other base from which writers have advanced both a critique and a vision, is a systems orientation, and a number of writers can be loosely or strongly be identified with this perspective. These include Meadows (1993), Milbrath (1989, 1996), (Bawden 1997a and 1997b) and particularly Banathy (1991, 1992, 1999).

Without spending too much time and space outlining the arguments put by these writers, the main conclusion I want to draw here is that there is a broad pattern of similarity between their stances, as they tend to endorse humanistic, holistic,

constructivist, and transformative views of education and learning. In sum, they advance a more relational or systemic view than the mainstream. Whilst some would no doubt dislike being tarred by the same broad brush, I think there is justification for suggesting that such writers - whether or not they would use this terminology - are contributing to the emergence of a postmodern, participatory, ecological paradigm in education.

I now want to turn attention specifically towards trends in environmental education.

4 ENVIRONMENTAL EDUCATION IN CHANGE

In this section, I argue that both realist and constructivist views of environmental education constrain its ability to move towards manifesting a sustainable education paradigm. Some of the history of the dominant instrumental approach to environmental education is briefly outlined and its relative ineffectiveness is seen as a product of the paradox whereby education for change is both required and constrained by social pressures. The possibility of deeper change in environmental education and indications of the postmodern ecological worldview are outlined in section 4.2.

4.1 The limits of environmental education in relation to sustainability

In the thirty or so years of environmental education's history there has been a gradual shift of paradigmatic base from environmental realism towards idealism, from behaviourism towards constructivism. For most of this period, the former has held sway, and environmental education discourse has been less concerned with critiquing and changing the larger contextual educational paradigm in which it is located (its metasystem), and more concerned with behavioural change at individual level and social change. (My argument here is supported by Smith and William's analysis, 1999.) In terms of the nesting systems model outlined in B.3.2 above, the focus of environmental education has tended to 'jump' a level: it has been less concerned with change in education and more concerned with education for social change. To give one example, a recent book entitled *Education for a Sustainable Future – A paradigm of hope for the 21st century,* makes virtually no reference to the dominant paradigm which limits the possibility of the 'paradigm of hope' becoming fully realised (Wheeler and Bijur, 2000).

In the past decade, however, there has been increasing interest in the 'education' (and learning) part of 'environmental education', and therefore, environmental education has been less driven by the 'environmental' part of the equation. I find this an interesting

change of emphasis, and it relates in part to the distinctions (above) between education ‘in’ and education ‘for’ change, and between intrinsic and instrumental values in education. It appears that most ‘leading-edge’ environmental educators are now concerned with the nature of the change in education and the kind of learning experience that is necessary, if we are to nurture personal or social transformation through learning. However, there is still an overall reluctance I feel, to critique and recognise the power of the dominant educational paradigm which constrains and in some ways contradicts and negates this new constructivism in environmental education circles. Fien (2000) is one of the few leading environmental education commentators who addresses these bigger issues in any detail, and talks about the need for second-order change.

There is another problem: in critiquing the more behaviourist/content-led/environment-led aspects of environmental education, some of this constructivism has abandoned any attempt to indicate the nature of sustainability. My feeling is that, while they know that it is not a ‘a thing’ (the criticism which Bell and Morse, 1999, make of the technocratic/scientistic view of sustainability, reviewed above), some environmental educators are unable to accept or articulate an ecological or whole systems view of sustainability, and so discussion tends to stop short. An understandable reluctance to be prescriptive, extends to a reluctance to be indicative too.

I will argue below, particularly in Part D, that:

- Keypoint: sustainable education is constructivist but also realist; that sustainability does imply a direction with regard to values and content which need to be explored through education; and that both intrinsic and instrumental education values are implied.

As I have stated above, what is needed is an alternative to the dominant epistemology, and I think that current discourse in environmental education is to some extent reaching towards that goal but needs to go further.

At present, dualism is deeply reflected in educational discourse, and this can apply almost as much to various forms of education (such as environmental education) that see themselves as transformative, as it does to mainstream education. So ‘here’ we have education (subject), and ‘there’ we have the environment (object), or health, or sustainability, and extensive debate follows upon how education can address the other. The best of recent debate in environmental education is beginning, I think, to break this down. I am interested to explore the ways in which an ecological or systemic

understanding of ‘sustainability’ and of ‘learning’ can reframe both and bring them into some form of mutual illumination and recursive relationship. It harks back to Bateson - what is the ‘pattern that connects’ learning, education and sustainability? Posing this question opens the perceptual door, it helps us begin to envisage, and indeed to design, an integrative and coherent ‘sustainable education paradigm’. This is taken further in Parts C and D.

Meanwhile, at the other end of the spectrum, a good deal of environmental education and education for sustainable development discourse remains strongly instrumental, at the cost, it seems, of sufficient reflection on the nature of the learning/teaching experience. I was surprised when I took part in the international ‘ESDebate’ internet debate in 1999 (Hesselink, van Kempen, and Wals, 2000) - hosted by the Dutch government and IUCN - how much this seemed to be the case. I want to now go back and review some of the history of this orientation.

Environmental education has long been seen in the body of literature that informs environmental education theory as a vehicle for change. Thus for example, the seminal ‘Countryside in 1970’ conference held in March 1965, which was critical to the emergence of environmental education in the UK, stated:

> Positive educational methods are needed to encourage awareness and appreciation of the natural environment as well as responsibility for its trusteeship by every citizen. The educational system has a decisive contribution to make in creating this awareness and sense of responsibility.
> (Council for Environmental Education, 1970, 6)

The Department of the Environment (DoE) echoed this sense of the role of environmental education in 1972:

> The opening up of opportunities for public participation in decision-making is the most important of all means to environmental education, which should aim at developing a critical, moral and aesthetic awareness of our surroundings.
> (Department of the Environment 1972, 2)

The DoE report was produced in the atmosphere of environmentalism that surrounded the UN Conference on the Human Environment of 1972, which itself underlined the importance of environmental education (recommendation 96) and lent it international legitimation. The UN Stockholm conference led, three years later, to the International Workshop on Environmental Education held in Belgrade. While the UN First

Intergovernmental Conference on Environmental Education held in Tbilisi in 1977 was to have a much higher profile and direct effect on the subsequent course of environmental education, it was Belgrade where the philosophy of environmental education was elaborated, and this had a decisive influence on the nature of the discourse at Tbilisi. The Belgrade conference was held by UNESCO-UNEP and it was here that the UNESCO-UNEP International Environmental Education Programme was launched. The Belgrade conference set out 'The Belgrade Charter - a global framework for environmental education' which made reference to the need for 'a new global ethic' (UNESCO-UNEP 1975).

Something of the faith in and great expectation of environmental education at that time is shown in Tolba's opening address to the Belgrade conference (he was then Deputy Director of UNEP):

> Education is at the heart of the process of development; and environmental education alone can make sustainable development feasible.
> (Tolba 1977, 48)

The Tbilisi report of 1977 states, among its many recommendations, that:

> Environmental education, properly understood, should constitute a comprehensive lifelong education, one responsive to changes in a rapidly changing world...By adopting a holistic approach, rooted in a broad interdisciplinary base, it recreates an overall perspective which acknowledges that the natural environment and man-made environment are profoundly interdependent...It should encourage initiative, a sense of responsibility and commitment to build a better tomorrow. By its very nature, environmental education can make a powerful contribution to the renovation of the educational process.
> (UNESCO-UNEP 1978, in Barry 1992, 11)

What is interesting about the interpretation of environmental education in the Tbilisi conference, and also (but to a lesser extent) in Tolba's view, is that they suggest a balance and integration of intrinsic values and instrumental values. Both the educational and sustainable development process are seen as having intrinsic value - the process itself is important, while reaching change goals through and in education and in sustainable development is also important (instrumental values). In other words, in these early statements, education is not merely seen as a tool in the service of

attaining a better environment - an instrumental view of environmental education - but process and change are seen and valued as part of the same dynamic.

The Tbilisi document then, appears to reflect an engaged, participatory view of environmental education, through which education is both transformed and transformative. Whilst current writers, including myself, tend to see this participative/process view of environmental education as a fairly recent insight, my point here is that early environmental education discourse was less overtly instrumental and behaviourist than we often remember. However, by contrast, a number of international documents since have tended to see environmental education primarily in an instrumental light. Four important examples follow:

From the World Conservation Strategy (WCs):

> A new ethic, embracing plants and animals as well as people, is required for human societies to live in harmony with the natural world on which they depend for survival and wellbeing. The long term task of environmental education is to foster or reinforce attitudes and behaviour compatible with this new ethic.
> (IUCN, UNEP, WWF 1980, Chapter 13, 1)

The EC Council of Ministers 1988:

> The objective of environmental education is to increase the public awareness of the problems in the field, as well as possible solutions, and to lay the foundations for a fully informed and active participation of the individual in the protection of the environment and the prudent and rational use of natural resources.
> (EC 1988, 1)

From the revised WCs of 1991:

> Sustainable living must be the new pattern for all levels: individuals, communities, nations and the world. To adopt the new pattern will require a significant change in the attitudes and practices of many people. We will need to ensure that education programmes reflect the importance of an ethic for living sustainably.
> (IUCN, UNEP, WWF 1991, 5)

And, perhaps most significantly, from Agenda 21, the main product of the UNCED conference:

> Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues...It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making.
> (UNCED 1992, Chapter 36)

This international endorsement has provided an important mandate, legitimation and encouragement for those involved in environmental education. However, Martin (1996, 43), long-time the senior education officer of WWF-UK, the largest NGO provider of environmental education resources in the UK, is critical of the international statements, arguing that they imply prescriptive sets of values relating to the environment, rather than opening up debate on the "attitudes and values that underpin and motivate the main socio-economic model and its resultant impact on the environment".

So the international mandate that has stimulated, informed and encouraged environmental education for some thirty years reflects paradox. While it tends to have emphasis on an instrumental view of environmental education (and by so doing rather devalues and ignores educational process) it tends not to recognise the cultural limitations and influences on environmental education and education as a whole. Further, the international mandate gives little idea of what sort of environmental education -what pedagogy and methodology - is appropriate. The resultant forms of environmental education tend to underacknowledge the powerful contextual influence that wider society and the dominant paradigm exerts upon the philosophy, nature and practice of education. By default perhaps, the forms of environmental education that respond to the mandate tend to be unchallenging, and therefore unlikely to bring about the changes in attitudes and behaviour envisaged by the high level calls (Fien and Trainer 1993).

- Keypoint: Education is seen as a means of effecting change in the social and cultural context - yet it is this same context which has overwhelmingly prescribed education a role of socialisation and maintenance, rather than transformation.

From a 'critical theory' perspective, this paradox is explained by the necessity to maintain hegemony - the 'dominant social paradigm' necessarily restricts the forms of

education for change possible. However, as my discussion above on paradigm theory might indicate, I am less convinced by the idea of hegemony with its implication of the purposeful and designed holding onto power, than the idea of paradigm as a powerful influence and 'trap'.

In some ways, the growth of interest in and provision of environmental education - from a standing start somewhere around the mid-sixties - has been impressive. Since then, there has been a huge explosion of interest in environmental education and training worldwide. Work on philosophy, research paradigms, pedagogy, curricula, resources, communication and dissemination strategies and so on, has multiplied with support from international agencies such as UNESCO, UNEP and IUCN, internationally active NGOs such as WWF, intergovernmental agencies such as the EC and OECD, national government policy and national NGOs, and increasing academic involvement.

Yet the results of all this work and activity might be said to be disappointing - across two levels. First, as far as it is possible to tell, it appears that environmental education and training programmes in the formal and non-formal sectors have made some, but not a great deal of difference to society's views or behaviour in relation to environment or sustainability issues, except to those relatively few people who have experienced excellent programmes. As UNESCO's then Director-General commented at the last UNESCO international environmental education conference, "who would deny that too little has been achieved?" (Mayor 1997, 1). Sauve adds, "the record is not impressive with regard to the importance of the social, environmental, and educational challenges at issue" (1998, 47). Second, as noted above, education as a whole has not reoriented itself around education for sustainable development (UNESCO, 2002).

It is perhaps not surprising that such giant goals as those at Tbilisi (to "create new patterns of behaviour of individuals, groups and society as a whole towards the environment", UNESCO-UNEP 1978), or others quoted above, are not met some twenty-five years later. But a systems perspective gives us further insights (see Diagram B.5 above). First, we cannot expect environmental education to be effective if it is working from a marginalised status, that is, if the dominant conception of the purpose and goals of education - its broader context - as a whole are largely unchanged. In other words, we cannot expect environmental education to be transformative where it shares a simple, instrumentalist, instructive, first order change, view of education and learning with the dominant educational paradigm. Second, (and moving up the system hierarchy), we cannot expect education as a whole to orient

itself around sustainable development if the dominant values of society, its forms of economic organisation and use of technology, on balance support unsustainable practices.

Thus in contrast to the often simplistic statements contained in international mandate - and often in curriculum documents - along the lines that 'increased environmental education will lead to a more sustainable world', a deeper enquiry has to concern itself with a whole range of questions, relating to epistemology, theories of education and of environmental education, social and cultural change, and the relation between these areas. This is necessary to the creation of what I have called here a sustainable education paradigm.

In Part A.1.1 (see Box A.4, 'Articulating and realising an ecological worldview'), I argued that environmental education, as a community of practice, would be more able to assist the realisation of a sustainable education paradigm if it were able to move towards five conditions. Overall, my conclusion based on recent reading and involvement in the field, and key sources such as Jarnet *et al.* (1998), Hesselink, van Kampen and Wals (2000), is that it has not yet met these conditions, although it is perhaps 'getting there'. These conditions as a whole are returned to in Parts C and D, meanwhile, the degree to which systems thinking and ecological thinking are reflected in environmental education (part of the five conditions) is discussed below.

4.2 Searching for systems thinking and for ecological thinking in environmental education

It is not particularly easy to find systems thinking in environmental education theory or practice. As someone deeply interested in both areas, I have found it surprising that environmental educators generally have not taken up, adapted, and used systems theory and practice in their work. It is odd, because both environmental education and systems thinking are 'ecological' in the sense that they are primarily about relationships, the one about people and environment, and the other about understanding and managing complexity. They both purport to be holistic.

There are perhaps several reasons for this lack of connection:

- the different - and quite separate - histories and background of environmental education and systems thinking

- the lack of systems thinking to be found in education generally - it is not 'on the agenda' of most policy makers and curriculum writers. (See whole issue of *Systems Research and Behavioral Science,* John Wiley, vol 16, no 2, Ison, ed. 1999.)
- the suspicion among some environmental educators that systems thinking equates with cybernetics and mechanism (Gough 1991)
- ignorance among many environmental educators about systems as a discipline.

My research indicates however, that this situation is changing. Even in the few years that this Thesis has been underway, there is evidence that, on the one hand, the systems thinking movement is taking a greater interest in both education and sustainability (Ison 1999, Wals and Bawden 2000, Blackmore, Ison and Martin 2000, Wals and Corcoran, in press), whilst on the other, environmental education is taking more interest in systems thinking (see Gauthier *et al* 1997, Wylie 1998, Day and Hough 2000). For example, a fairly recent book on education and sustainability begins by stressing the importance of systems thinking: "education about sustainability in essence is about learning to make and understand the connections and interactions between…complex systems" (Wheeler and Bijur 2000, 2). However, Wheeler and Bijur's book, despite its subtitle 'a paradigm of hope for the future', makes virtually no attempt to outline how systems thinking contributes to the ecological paradigm.

According to my research, there are several forms and instances of environmental education taking on board systems approaches. While it is perhaps unnecessary to catalogue these in any detail, three categories might be distinguished as follows:

- In general environmental education where systems tools are used as a methodology (Bakshi and Naveh, 1980, Keiny and Zoller, 1991, Day and Hough 2000). I have found but a handful of books on these lines which although very interesting to me, represent a minority interest in environmental education.
- In environmental science where systems theory is employed in understanding natural environmental systems (for example, Tivy and O'Hare 1981, Park 1997).
- In training for professionals in the area of sustainable development. For example, the Professional Practice for Sustainable Development project (Institution of Environmental Sciences), and The Natural Step programme. This is less surprising, as systems thinking has a much stronger presence in business practice than in education (Senge 1990).

I have few reservations about these manifestations of systems thinking in education and training, and indeed, would welcome a much greater movement of this kind. However, arguably, much of this use of systems thinking is in the area of first order learning, that is, use of systems tools to conceptualise and problem-solve, rather than encourage deeper systemic learning and change in people or organisations. This may be an overgeneralisation however, and some of this material indicates interest in deeper holistic change.

This brings me to the second search, which is how far ecological thinking - which I have distinguished from 'systems as discipline' in Part A - is manifested in environmental education. That is, how far environmental education reflects the emergence of a new, participatory, ecological epistemology. Again, I've been surprised over the years to find that the answer is less than I've always thought 'should' be the case. The reasons for this are reflected in much of the discussion in this Part B, and include the influence of the dominant epistemology. Thus, the instrumentalism and behaviourism of much environmental education reflects ecological managerialism and ecological modernisation which are part of this dominant epistemology, rather than deep ecological thinking.

However, there are signs that some environmental educators are beginning to articulate what I have called here the postmodern ecological worldview. I would count David Orr amongst them, particularly his *Ecological Literacy: education and the transition to a postmodern world,* of 1992. Other more recent authors (and titles, which are instructive here) include Laura and Cotton 1999, *Empathetic Education – an ecological perspective on educational knowledge;* O' Sullivan 1999, *Transformative Learning - Educational Vision for the 21st Century;* and Smith and Williams, 1999, *Ecological Education in Action.*

Such works are interesting because they develop an *expanded* view of environmental education as a basis for a changed ecological educational paradigm, in keeping with and parallel with the ecological worldview expounded and illustrated above. What these writers tend not to do however, is advance a sufficient theory of whole systems thinking which, in my view, gives this movement coherence, complementarity with parallel movements in ecological sustainability, and a more immediate intelligibility and practicability.

5 A SUMMARY AND CONCLUSION

To recap, to this point the Thesis has:

- in Part A, outlined the critical and historic nature of our times and the need for deep change in society and education, and
- in Part B, explored the meaning and emergence of an ecological postmodern paradigm in the context of worldview change.

In particular, in Part B, I have sought to outline the philosophical debates and cultural and social changes which influence both the form of education as we now find it and the environmental education debate. This shifting context, and the account of the nature and extent of the emerging ecological worldview, indicate the constraints on and possibility of deep learning in the education community: that is, the possibility of transformation in education whereby it might become more transformative and effectual in regard to the sustainability transition. I have used learning level theory to differentiate between qualities of learning and suggested that despite most learning in both formal education and social learning contexts being 'first order', there are signs of deeper learning in both areas that hold the promise of positive co-evolutionary change in future. Such deep learning may be a combination of both *contingent* and *intentional* learning.

As regards contingent learning, the systems perspective tells us that any system under stress reaches a 'bifurcation point' whereby it breaks down or breaks through to a new state. If we apply this model to our times, it appears that the current sense of loss of old certainties and structures associated with modern times present the possibility of increasing chaos and/or of some sort of transformation through learning. As Henderson (1996,2) suggests:

> the dysfunctionality of the paradigm forces us toward new approaches…we see how breakdowns are often precursors of and even necessary for breakthroughs.

Stress, chaos and breakdown may or may not precipitate deep learning, but a constructive vision of an alternative epistemology would help 'accelerate the shift' (Gardner 2001,189) to a more sustainable and more peaceable world, with less pain. As I suggested in A.3.2 'the learning society' is one that seeks to understand, transcend and re-direct itself, and the need to critique and remake its epistemology through intentional learning is pivotal in this urgent task. I have argued above that

whole systems thinking may be seen as a worthy and plausible basis for such an ecological epistemology, and this is explored in more detail in **Appendix I.** The theme of re-thinking and re-visionising the guiding educational paradigm accordingly is the subject of Part C, and this theme is then echoed with particular reference to environmental and sustainability education in Part D.