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Alan C. Kay’s Scientific American article, ‘Computers, Networks and Education’, (1991) will be used here as the basis for examining the ideological orientation of the experts who develop and promote the educational use of this technology. Insofar as computers embody the conceptual framework (and thus ideology) of the experts who create them, the technology itself can be viewed as reproducing a specific ideological orientation. But here the primary reference point will be on the ideology embedded in how computer experts think about the educational uses of this technology. Kay was chosen as an exemplary figure in this field because of the breadth of issues he addresses, and because of his leadership role within the field. The nature and implications of this ideology can be made explicit through the analysis of the following three propositions: (1) the justifications and actual educational uses of computers reinforce an historically and culturally specific ideological orientation; (2) this ideology is based on fundamental misconceptions about the nature of the individual, what is involved in the processes of knowing (that is, the nature of intelligence), and how individual empowerment relates to social progress; and (3) the metaphor of an ‘Information Age’, which is the most recent expression of this ideological orientation, serves to hide the moral/spiritual nature of the ecological crisis.

PROPOSITION RELATING TO THE NATURE OF THE IDEOLOGY THAT FRAMES HOW COMPUTERS ARE JUSTIFIED AND USED IN EDUCATIONAL SETTINGS

Kay’s article presents compelling reasons for embracing computers as the primary technology through which all classroom learning should be mediated. Indeed, the advantages of computers make an impressive list:
- ‘Interactivity’ that takes a variety of forms, including allowing the student to experience interactive processes from within the phenomenon being studied;
- ability of computers to ‘become any and all existing media’ (e.g. books, musical instruments etc.);
- providing for learning from many different perspectives; building a dynamic model of an idea through simulation;
- exhibiting different patterns of reflective thought; and, finally,
- networking resources that become, in effect, a universal library (pp. 147-148).

Like the introduction of the printing press, Kay views computers as a truly revolutionary technology that will serve as ‘powerful amplifiers, extending the reach and depth of the learners’ (p. 146). The promised versatility of computers is what is likely to capture the attention of most readers, but the fulcrum that sustains Kay’s vision of technologically based educational empowerment is a core set of assumptions that are so widely taken for granted they will go largely unnoticed. As the efficacy of computer-mediated learning is dependent upon these core assumptions, we must bring them into clearer focus. These assumptions, as we shall see, are also basic to the liberal ideology that has been responsible for the development of the more problematic aspects of modern consciousness.

Although Kay gives the impression of making a rational argument about the revolutionary nature of computers he is unable to deviate from the basic presuppositions of modern liberalism. For example, Kay’s way of understanding the nature of the individual as a self-constituting being is reflected in his statement that ‘each of us has to construct our own version of reality by main force, literally, to make ourselves. And we are quite capable of devising new mental bricks, new ways of thinking, that can enormously expand the understanding we attain. The bricks we develop become new technologies for thinking’ (p. 140). This statement, along with his argument that different classroom computer applications for freedom facilitate the students ‘who come up with the ideas … to develop knowledge of their own collaboratively’ (p. 145), also reveals another assumption that Kay takes for granted as a modern, enlightened thinker. Namely, that the highest purpose and most essential aspect of human fulfillment is continually to create new ideas that take account of the information continually made available by advances in science and technology. This second assumption, to put it more succinctly, is that information is the basis of thinking. Kay’s third assumption is essential to establishing the moral legitimacy of his vision of conceptually autonomous individuals. It also serves...
to place the process of self-creation within a temporal framework that represents change as progressive in nature. Writes Kay:

'Humans are predisposed by biology to live in the barbarism of the deep past. Only by an effort of will and through the use of our invented representations can we bring ourselves into the present and peer into the future.... In other words, each generation must be able to quickly learn new paradigms, or ways of viewing the world; the old ways do not remain useable for long.' (p. 140)

Like other proponents of educational computing, Kay manages to bring all the essential elements of the liberal canon into his 'the future is now' argument: individual autonomy; rational empowerment is dependent upon data; change is linear and progressive; anthropocentrism; and universalising the tenets of liberalism by equating them with modernisation. That this ideology only goes back 17 or so generations, and encodes the metaphorical constructions of European cultures struggling to make the transition from an organic to a mechanistic root metaphor, is made irrelevant by the hubris of his position. Nor does it occur to Kay that there are other ideologies that must be taken into account, particularly when a technology is being represented as possessing the capability of networking everybody into a global information and learning environment. As space is limited here, I will identify different ideological traditions that bring into focus aspects of human experience that are not taken into account by the liberal ideology that guides Kay's thinking. But the suggestion that they represent a different conceptual mapping process, and thus a different political order, does not mean that they are necessarily free of distortions. Rather, they are being identified because they help bring into focus aspects of the human/cultural/habitat relationship ignored by the universalising and essentialising characteristics of liberalism.

While the categories are not meant to be exhaustive, it makes sense to identify at least three different forms of conservatism that, in their respective ways, challenge the liberal mind set that both justifies the worldwide use of computers and what is reproduced through their use. The first can be called temporal conservatism. Basically, it represents the psychological/cultural tendency within human experience to feel comfortable with taken for granted patterns and routines — which include the patterns in the multiple languages that enable a person to participate in the larger mental ecology we refer to as 'culture'. Contrary to the heroic image of liberalism, where autonomous individuals 'make contents visible ... explicitly reshappable and inventable' (p. 140) and thus is always experimenting with conditions of existence, most individuals — even ideologues like Marx, Dewey, and Freire — find meaning in taken for granted patterns. Although we may find many of the taken for granted patterns morally and ecologically problematic, the acceptance of embeddedness in taken for granted patterns and relationships is probably more a fundamental characteristic of human experience than the images of human existence projected by liberalism.

Philosophical conservatism, which shares with liberalism nearly the same time span and cultural geography, is far more complex than temperamental conservatism — which seems to cut across cultural boundaries and ideological genres. The insight of philosophical conservative thinkers that represents the greatest challenge to Kay's fusing an uncritical view of technologically based (e.g., computers) cultural experimention with an equally uncritical view of progress is their tendency to frame issues in terms of a dialectical tension — and to continually challenge formula political thinking by problematising the side of the dialectic relationship being overwhelmed by the rush of events. The dialectical tension usually revolves around the specific relationships of individual — community, progress — tradition, and rational/theoretical thought — experience. The philosophical conservative also has a more complex view of what is metaphorically known as human nature; that is they take into account the historical record of the many ways individuals have used the various sources of empowerment for both positive and destructive ends. While on this point, it is interesting to note that Kay adopts the liberal view of human nature, where the tools of reason will always be used for progressive and humanitarian ends. The evidence, as philosophical conservatives would point out, is that computers are also being used to serve the interests of specific groups — centralising economic and political power by making the panopticon society a closer reality and by turning many work settings into 'electronic sweatshops' (Garson, 1988). The multi-dimensional view of human nature central to philosophic conservative thinking led James Madison to argue for a system of political checks and balances.

By returning to the relevance of the philosophic conservative's dialectical concerns, we can see more clearly the limitations of Kay's liberalism. Kay, as well as such other leading advocates of educational computing as Seymour Papert, Alfred Bork, and David Moursund, view the rational process as empowered through the use of data — and recognise only explicit forms of knowledge. The philosophic conservative would agree that this is indeed one category of knowledge, but would also want to take into account both the complexity of tacit knowledge and forms of cultural storage where the messages get communicated through multiple semiotic pathways. Similarly,
the philosophic conservative would agree that the scientific method/technology connection worked out over the last three and a half centuries indeed represents a record of progressive achievement, but they would also want to give serious consideration both to the complex nature of tradition (which the scientific/technology juggernaut seems bent on simplifying and treating as something to be totally emancipated from) and to specific traditions that have been lost as a result of scientific/technological advances. Is mono-agriculture an actual advance over previous agriculture traditions? What traditions were overturned by Taylorism? How has television affected people’s sense of family and community? What will be the impact of computer-mediated communication on oral traditions? Kay expresses his understanding of the past (tradition can be thought of as anything from the past that is handed down to the present) through the use of such phrases as the ‘barbarism of the deep past’ and ‘naive reality’; he also views as non-problematic the statement attributed to Susan Sontag that ‘all understanding begins with our not accepting the world as it appears’ (p. 141). The liberal bias toward emancipation from tradition is such a prominent part of Kay’s thinking that he is unable to recognise that every experiment (that is, the introduction of a new idea, value, technology) creates a moment of cultural liminality that should require both an awareness of the traditions that are being altered or lost and a thoughtful consideration of whether the new is a genuine advance over the old. Just as tradition yields to his progressive view of change, Kay is equally silent on the tension between the empowerment of the individual and the forms of interdependency that characterize membership within a community — which is another area of concern to philosophic conservatives (who may come down on the side of more individual empowerment and freedom when the panzers of community existence become too rigid and oppressive). The philosophic conservative argues that an individual’s self-identity and thought/communication patterns are dependent upon membership in a community. Participation in this cultural ecology involves multiple dimensions of learning and communicating — including analogue knowledge that, by its very nature, cannot be made explicit and re-encoded to fit the digital technology required for computer-mediated communication. There is also another aspect of the individual/community relationship that does not fit the form of consciousness amplified by a literacy-based technology, such as computers. Community, as Alasdair MacIntyre observes, provides the basis for answering basic existential questions.

'I can only answer the question what am I to do? if I can answer the prior question of what story or stories do I find myself a part?’ (p. 216)

MacIntyre is pointing to constitutive forms of knowledge that are not reducible to data or information — which seems to be the only form of knowledge recognised by Kay’s narrow commitment to the scientific/technological paradigm. As MacIntyre puts it:

'I am not only accountable, I am one who can always ask others for an account, who can put others to the question, I am part of their story as they are part of mine. The narrative of any one life is part of an interlocking set of narratives.’ (p. 218)

and this ongoing process of narrativising also involves learning, and validating within the context of one’s own life, the moral analogues that represent the community’s way of understanding good and evil. Not all of a community’s analogues of morally responsible behavior will stand the test of critical reflection. Whether the moral templates of a community can really be kept separate from the data flowing through computers and into the heads of students is a question that Kay ignores, just as he ignores that communities are moral ecologies — that is, the life of a community involves ongoing relationships. These relationships are based on some conception of how a good person acts within a specific context. Later, we shall address what is problematic about the philosophic conservative’s view of community, and in the process bring into sharper focus why the liberalism that Kay utilises to explain the educational computing/progress connection represents a reactionary position.

The third form of conservatism, what can be generally termed cultural conservatism, provides a different vocabulary — and thus helps illuminate a different set of issues ignored by the liberal devotees of educational computing. Cultural conservatism complicates all attempts to make ideological distinctions, such as the attempts being made here. Basically, any cultural group who reproduces through its patterns of semiogenesis the templates or blueprints ‘for the organization of social and psychological processes’, to use Clifford Geertz’s way of explaining cultural patterns (1973, p. 216), represents an example of cultural conservatism. In terms of most cultural groups who reproduce (conserve) their collective patterns through the language systems they privilege, cultural conservatism can be viewed as less reflective than philosophical conservatism. But even the achievements of philosophical conservatives, like our Constitution, Bill of Rights, and tripartite system of government can, at this more basic level of political categories, be viewed as the expression of cultural conservatism. Even the cultural artifacts and thought patterns that are the legacy of liberalism, technologies and conventions that reflect the liberal view of the rights and freedom of the individual as well as the contradictory patterns that evolved out of the Classical Liberal’s concern with profits and the forces of competition, can be viewed as a cultural ecology that reproduces itself through time — and thus can be included in the category of cultural conservatism. That liberalism attempts to conserve the patterns of thought and social practices that accelerate the role of change and continually relativise the shared moral norms that guide relationships (what Edward Sklar calls an ‘anti-tradition’) is not the critical issue here. But a case can be made that conserving a way of thinking that does not recognise the nihilism in its sanctioned approaches to progress is in deep trouble.

The recognition of cultural conservatism is important to our discussion of Kay’s liberalism for two reasons. First, it helps bring into focus that change is not the dominant characteristic of everyday life. Rather, the re-enactment of traditional patterns
is the most pervasive aspect of human/cultural existence. Change (re-interpretations, technological innovations, creative leaps, and so forth) involve reworking traditions that connect the present to the past. Contrary to Kay’s notion of rational empowerment in the quest to determine and control the future, traditions are a source both of empowerment and limitation. He might compare the ontology of liberalism with the practices in the two most antitradition arenas in modern society (science and technology) to see if ‘advances’ involve building upon and reworking the existing knowledge base. The other reason for bringing cultural conservatism into a discussion of the ideological orientation of educational computing has to do with Kay’s failure to recognise that there are many other cultural groups (even within our society) whose symbolic worlds are based on fundamentally different root metaphors than the ones underlying Kay’s liberal/technocratic view of reality. The forms of knowledge that have authority, approaches to technology, way of understanding the ‘individual’, moral and conceptual categories for understanding the human-environment relationship vary widely. Most of these cultural groups do not share Kay’s liberal view of the autonomous individual, the epistemology that gives primacy to ‘objective’ data as the basis of thought or his escalator view of progressive change. The critical issue that Kay sets aside by universalising his ideological orientation has to do with how a technology which reproduces a specific ideological (including cultural/epistemological) orientation can be used by other cultural groups without subverting their traditions. To put it more succinctly: is the computer, particularly when used to mediate the complex cultural transmission processes that characterize ‘education’, the liberal’s latest means of cultural imperialism? The issue can be made concrete by asking whether the following statement by Kay represents a characterisation of the human condition that could be accepted by Native American cultural groups who are attempting to recover their own ontologies: ‘each generation must be able to quickly learn new paradigms, or ways of viewing the world; the old ways do not remain usable for long’ (p. 140). Their ways of understanding time, what has authority, and the fundamental relationships that must be respected if life is to continue, simply cannot be reconciled with Kay’s relativistic and experimental approach to existence. The introduction of cultural conservatism into the discussion, in effect, challenges the advocates of liberal thought to face up to whether they really believe in a tenet they often identify themselves with: namely, the right of cultural self-determination. Reconciling this tenet with the liberal’s tendency to universalise the characteristics of the modern individual represents a double bind within liberal ideology that Kay fails to recognise.

PROPOSITION RELATING TO FUNDAMENTAL MISCONCEPTIONS ABOUT THE NATURE OF THE INDIVIDUAL, INTELLIGENCE, AND THE EMPOWERMENT/SOCIAL PROGRESS CONNECTION

Kay’s view of individual intelligence reflects the current orthodoxy that learning occurs through multiple pathways—‘doing, seeing, and manipulating symbols’. He also subscribes to the key tenet of this orthodoxy: namely, that individuals construct their own version of reality. ‘It was the children who came up with the ideas’, to recall another statement he made. To put it another way, thinking is an individual activity which is facilitated by acquiring data through all the senses. This modified Cartesian view of intelligence thus continues to buttress the liberal view of the autonomous individual, and turns pedagogy into a quest for techniques that will match learning environments with the students learning style. Computers, as Kay views them, offer unexplored curricular opportunities as ‘information carriers’ that can be articulated to each student’s style of learning.

While I am not suggesting that Kay’s optimism about the computer’s ability to facilitate certain forms of learning is totally unfounded, I am claiming that his ideological orientation, including the Cartesian epistemology that is an integral part of this ideology, leads him to adopt a view of individual intelligence that is no longer defensible. Kay can rely upon Piaget and Bruner (and such other translators of the constructivist position in the field of artificial intelligence as Papert and Minsky) as legitimating authorities for his position, thus making challenges to his position appear to go against the grain of the modern mindset, with its emphasis on individual self-direction and empowerment. But what current authorities and the sheltering zeitgeist fail to take into account is the growing body of evidence that thought and linguistic patterns are rooted in the epistemic patterns of a cultural group. To put this another way, what Kay identifies as individual thought largely involves the thought patterns of the cultural group — with individualistic variations in interpretation and degrees of reflexivity.

Briefly, three sources of evidence can be identified as justifying a more culturally based way of understanding human intelligence. Each involves a very complex set of issues, and the ability to address the issues (and supporting anthropological and linguistic evidence) through a different interpretative framework than what liberalism makes available. The first challenge to Kay’s constructivist position can be made from the growing recognition that the language/thought connection is metaphorical in nature. As I have discussed this elsewhere (1984,1990), including the role of metaphorical thinking in educational software (1988), I will reiterate only the most salient points — by using examples of how metaphors organize Kay’s own patterns of thinking as he explains to the reader the educational potential of globally networked computers. But first a brief explanation of the dynamics of metaphorical thinking may be essential for the reader who is encountering this argument for the first time.

The most important point that attention to the metaphorical nature of thinking helps us to recognise is that a totally new experience cannot be

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understood on its own terms. We gain an initial basis of understanding through the process of analogic thinking, where the already familiar patterns and schemas are, so to speak, mapped onto the new territory. Understanding 'artificial intelligence', 'virtual reality', 'social evolution', 'individual', and 'data' were (and still are — as the image in the iconic metaphors continue to change) dependent upon thinking of the new in terms of the familiar. The choice of generative metaphor (metaphorical representation of some familiar area of experience or conceptual understanding) is influenced by the prevailing root metaphors of the cultural group. In other words, the root metaphor of viewing the world and all life processes as machine-like made it conceptually coherent to think of the mind as a data-processing device, and to use this image as the generative metaphor for making sense of the first computers. Root metaphors, in effect, provide the master templates or conceptual frameworks which influence the process of analogic thinking, and become encoded in the iconic metaphors that survive the politics of analogic thinking. When we recognise that root metaphors are cultural and individualistic.

The culturally specific root metaphor that organises Kay's view of reality (that is his way of understanding how things hang together) is a composite of the mechanistic view of the universe, the view of time and change as moving in a linear/progressive direction, and the view of the individual as the primary social unit — all worked out in the processes of analogic thinking that occurred during the 16th and 17th century transition from the root metaphors of the Medieval period to the modern/scientific/liberal form of consciousness. His entire article can be viewed as a series of analogic thought processes, but each minimal possibility — how we might understand 'intelligence', 'computers' (the computer, he writes, 'is like the greatest piano ever invented?'), 'benefits of this technology', and 'change' — is framed by the root metaphors that we have identified as central to liberal ideology. When he uses iconic metaphors such as 'change', 'experiment', 'individual' and 'ideas' the schema encoded from earlier processes of analogic thinking reproduce the already established patterns of thinking. For example, his use (which now becomes a misleading phrase) of the iconic metaphor 'change' reproduces the conceptual pattern that represents change as progressive in nature. Similarly, new ideas, more information, new technologies, and the transformation of modern culture itself, are all represented as progressive steps — as he puts it, 'great numbers of people will not avail themselves of the opportunity for growth and will be left behind'. The principal question here is, 'Is this statement an example of an individual thought process that is based on data, or is it an example of thought being organised in accordance with the master schemas of a cultural group?' If language thinks us as we think within the language, then the liberal notion of autonomous individuals constructing their 'own version of reality' goes out the window.

The second kind of evidence that undermines Kay's epistemology can be related to the argument on the metaphorical nature of the language/thought connection, which I have framed here in terms of how past forms of metaphorical thinking within Kay's own cultural traditions continue to influence the present. But it can also stand alone. Literature in the fields of anthropology and social linguistics now provides massive documentation of profound differences in the world view of cultural groups. I shall identify here only a few examples of cultural groups whose root metaphors differ radically from Kay's taken for granted symbolic world. The examples were also chosen because they represent cultural groups who understood empowerment in terms of learning the traditional practices that were more attuned to living in ecological balance — which is profoundly different from the view of the form of empowerment and social progress Kay takes for granted.

The root metaphor that helps to frame time as linear and progressive in Kay's thinking is not present in N. Scott Momaday's primary cultural group (Kiowa). Writes Momaday, 'I want to indicate as best I can an American Indian attitude (for want of a better word) toward the word as a whole ... I am talking about a spiritual sense so ancient as to be almost a pervasiveness as to be definitive — not an idea, but a perception on the far side of ideas, an act of understanding as original and originate as the Word. For the Indian there is something like an extended present. Time as motion is an illusion; indeed, time itself is an illusion. In the deepest sense, according to the native perception, there is only the dimension of timelessness, and in that all things happen.' (1987, p. 158)

Within this way of experiencing time, empowerment would be associated more with the re- enactment of proven patterns that help sustain relationships with other forms of life that participate in this ecology of time. Furthermore, the sense of connectedness is grounded in a form of spiritual awareness that is totally absent from the secularising and anthropocentric way of thinking that characterises Kay's world of information processing.

The Wintu Indians of Northern California are an example of a cultural group whose view of individualism differs profoundly from the form of individualism and thought patterns that Kay wants to treat as a universal, culture-free being. A study of their language/thought patterns, as Dorothy Lee observes, reveals how the Wintu represent the self in a fundamentally different way than we do in English.

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... A study of the grammatical expression of identity, relationship and otherness', shows that the Wintu conceive of the self not as strictly delimited or defined, but as a concentration, at most, which gives place to the other. Most of what is other for us, is for the Wintu completely or partially or upon occasion, identified with the self.' (1959, p. 134)

EDUCATIONAL COMPUTING. MAY 1992

18
Furthermore, the understanding of self in contextual, relational, and mutually participatory terms with the other, which may involve a person-person relationship or a person-plant or animal relationship, involves a different form of knowledge and by extension, what would be regarded as intelligence. As Lee notes, the Wintu language (and thus thought patterns) do not represent the world in abstract and universal terms — where an ontology of thingness and shared essences exist. Nor is there an understanding of knowledge as encoded in ‘data’ that has unknown origins, and whose validity is separate from contextual considerations. Rather, intelligent behavior (if they were to use such a term) is contextual, participatory, and — in Gregory Bateson’s terms — part of a mental ecology that includes the larger biotic community.

If the followers of Kay’s ideology think I have chosen an obscure tribal group to buttress my argument that cultural groups have different root metaphors for understanding the patterns and forms of empowerment Kay wants to treat as universals they might consider the cognitive/language differences associated with the predominant use of count nouns in the English language and the use of mass nouns in Chinese. The works of Chad Hansen (1983) and Ron and Suzanne Scallon (1981) are especially useful in clarifying how fundamentally different ways of knowing, and thus ontologies, are reproduced through the linguistic patterns of a cultural group. Examples from American Indian cultural groups, rather than the Chinese, were used because their language/thought patterns demonstrate a sensitivity to environmental relationships in a manner that is absent in Chinese thinking. As the ecological crisis is likely to displace the ‘Information Age’ as the dominant concern in the decades ahead, I chose examples that illuminate the problems with Kay’s vision of the future — including his approach to using computers to teach students how to understand ecological systems. The ‘barbarism of the deep past’, to recall Kay’s statement, reflects a basic misunderstanding of the achievements of many primal cultures. When judged against the yardstick of technological achievements, they may appear backward. But when they are judged against the more important yardstick of achieving long term sustainability in a limited habitat, and in developing the patterns that encoded their moral/spiritual knowledge for living within the larger biotic community, it might make more sense to pin the label of ‘barbarism’ on the morally impoverished approach to technology that characterizes Kay’s position.

**PROPOSITION RELATING TO HOW THE REPRESENTATION OF THE FUTURE IN TERMS OF THE ‘INFORMATION AGE’ HIDES THE MORAL/SPRITUAL NATURE OF THE ECOLOGICAL CRISIS**

Kay’s article provides clear evidence that he considers the ecological crisis an important classroom challenge. ‘We particularly wanted to investigate’, he writes, ‘how children can be helped to understand that animals, people and situations are parts of larger systems that influence one another.’ The educational use of computers would allow students to simulate the patterns and consequences that would emerge from different ways of understanding and designing solutions to different human/habitat relationships. The different capacities of the computer would provide the data and simulation models that would empower students to ‘come up with the ideas,’ and to develop knowledge of their own collaborativity — to recall Kay’s way of representing the primacy of the autonomous individual’s reflective process. However, Kay’s sensitivity to the importance of helping students understand the interactive patterns of existence within larger ecological systems is undermined by the ideology that frames his way of understanding the empowerment/social progress relationship. The metaphor of the ‘Information Age’ is emblematic of the double bind that characterizes his position.

Just as the metaphor of the ‘Industrial Revolution’ served to illuminate the special form of technological achievement of the early phase of liberal/modern society, the metaphor of the ‘Information Age’ is supposed to signal a profound change in the direction of technological progress. And just as the earlier metaphor both illuminated and hid at the same time, the new metaphor also creates areas of silence. The way of understanding the moral implications of different kinds of relationships in the era of the Industrial Revolution was dependent upon reifying the arguments of theorists on the nature of individualism, competition, and progress in a way that made them appear as universal norms. The non-human aspects of the world were understood as either ‘natural resource’ or as part of the wild and predatory world that had to be brought under human control. The underlying ontology that underlies the dawning of the Information Age. The evidence supporting this optimism, which Kay fully shares, includes the continual increase in technological innovations (evidence of human progress), ever more massive amounts of data (the source of rational empowerment), and the increasing development of a modern form of monoculture as computer networks lead to the wider adoption of English as the preferred language of computer mediated discourse (evidence of movement toward a unified world order). These developments appear to support the optimism that pervades all areas of the computer technology community — including the advocates of computer-mediated education. But there is other evidence that is generally ignored by the people who have embraced the Information Age as the logo for the 21st Century. The continued degradation of natural systems, the alarming increase in human population —

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particularly in areas of the world where local eco-systems are already seriously stressed, the continued expansion of a wasteful form of consumerism — with only a marginal awareness of environmental consequences, all point to a future scenario for humankind very much at odds with the computer devotee's vision of progress. Elsewhere (1991) I have argued that the epistemology embedded in computers, in spite of the technology's capacities to collect and process vast amounts of data, relating to changes in the earth's eco-systems, contributes to deepening the ecological crisis (1991). Thus I want to focus here more specifically on how the educational uses of computers reinforce the nihilistic tendencies in liberal education — which must also be understood as having devastating consequences for the rest of the biotic community.

Nihilism has generally been understood as the relativising of belief and values, the loss of shared cultural norms, and the personal experience of meaninglessness. It may take the form of self-absorption to the point where nothing outside the self has value or meaning; it may also take the form of the person who uses the rational process to continually de-authorise all forms of cultural authority (Dreyfus, 1981). Both of these expressions of nihilism have been associated primarily with humans. But the relativising process can also be associated with technology, as well as be extended to a discussion of the human/habitat relationship. In the case of computers, which are part of the tradition of print technology and also reinforce the Cartesian epistemology, they can be understood as a technology that amplifies the cultural patterns contributing to the more traditional view of nihilism, and to the forms of nihilism expressed in the relationship many individuals have with the environment.

Eugene Provenzo, Jr's examination of the moral ecology that students are immersed in as they play video games, particularly Nintendo, clearly illuminates how the messages, simulations, and reinforcement patterns are expressions of nihilism — masked as fun, excitement, and the challenge of problem solving. As Provenzo notes, 'violence is the main operative function in all these games' (1991, p. 89). The immediate excitement of a particular game, which conditions the participant to interact with the last place of electronically-mediated representations of reality, can be exchanged for other equally segmenting experiences. Supposedly, students maintain control over the length and content of their interaction with computer games. This experience of discontinuity from the more reciprocal patterns that characterise everyday life, most of which are governed by shared moral norms, as well as the distinctive moral messages in the games themselves, contributes to nihilism.

But understanding how computers contribute to a nihilistic relationship between the individual and the environment requires we adopt a more cross-cultural approach. That is, in order to recognise how taken-for-granted cultural patterns amplified by computer mediated communication and thought processes contribute to the desensitising of students toward the interactive life sustaining relationships with the 'natural' environment we need to consider the contrasting patterns of cultural groups who understand that their long term existence depends upon not destroying their habitat. A basic difference that appears to separate primal, ecological sustainable cultures from the modern culture (including what is envisaged as the culture of the Information Age) is that their languages are attuned to representing the human/environment relationship as collaborative and interdependent. Unlike the grammar of our language, which represents the 'I' as separate from the object being acted upon; that is, the subject, 'I' is in control, and the object is separate, passive, subject to 'my' control, the grammar of the Koyukon, according to Ron and Suzanne Scollon, represents the person/environment relationship as mutually collaborative. As human relationships are framed by the patterns of moral sensitivities of the cultural group, any discussion of language (which, according to the Scollons, is always about relationships) is also a discussion of the deepest levels of a cultural group's moral codes — including moral codes that are nihilistic. The collaborative nature of relationships in Koyukon can be seen in the sentence 'twenty-two aaha biyl k'ililt', which the Scollons translate as 'using the twenty-two, along with the lynx as my co-actor, I shot (a gun)' (1985, p. 16). Similarly, the language of the Wintu, according to Dorothy Lee, frames relationships as a 'coordinate togetherness, with, at most, a stressed point of view' (1959, p. 137).

The distinction Jim Cheney makes between a 'colonising discourse' and 'contextual discourse' (I would suggest calling it an 'ecological discourse') brings out the fundamental moral and political differences between English and the languages of cultural groups that understand humans as interdependent members of a larger biotic community. The colonising discourse represents the speaker as the actor and the rest of the world as the recipient of the speaker's emotive or rational intentions. The ideal of this discourse, as Alvin Gouldner points out, is — one word, one meaning, 'for everyone and forever.' (1979, p. 28) This discourse, and this is where the English language and liberal/Cartesian epistemology come together, is also based on a view of the rational process that involves 'objectifying' what is known, making it 'explicit' (in fact, recognising only explicit forms of knowledge), treating the object of knowledge as context-free, understanding the object of knowledge as context-free, understanding the object of knowledge in terms of component parts that can be (at a theoretical level) re-conceptualised into a new system, and understanding the object of knowledge from the perspective of the rational subject (Dreyfus, 1981, pp. 510–511). Knowledge thus becomes context independent, universal, and objective. It serves as the basis of a colonising discourse because it conditions the speakers/thinkers to experience themselves as separate from the world that is known and acted upon. Furthermore, the cultural/ecological context is not important, as the discourse (and data) can be utilised to think and communicate about how to make what is going on in any context more amenable to rational control. If we keep in mind the Scollon's

Nihilism has generally been understood as the relativising of belief and values, the loss of shared cultural norms, and the personal experience of meaninglessness.

It may take the form of self-absorption to the point where nothing outside the self has value or meaning; it may also take the form of the person who uses the rational process to continually de-authorise all forms of cultural authority (Dreyfus, 1981).
observation that language also helps to frame the moral nature of relationships, we can see that the colonising discourse frames relationships in instrumental terms. Any possibility of a moral relationship between the human/non-human world is eclipsed by economic and political considerations. And what does not have instrumental value (as a ‘natural resource’ falls into the catch-all categories of the useless, material, and non-intelligent — in a word, that which is meaningless from a human point of view. When humans relate to contextual relationships and the non-human aspects of the biotic community as meaningless or, at best, as temporarily lacking in instrumental value, they are expressing nihilistic attitudes.

Jim Cheney's observations on the nature of contextual discourse brings into sharper focus the nihilistic elements in the colonising discourse underlying the scientific/technological culture that Kay identifies with the Information Age. Writes Cheney:

‘Contextual discourse ... assimilates language to the situation, bends it, shapes it to fit. Contextual discourse is not fundamentally concerned with issues of overall coherence. Or, rather, the kind of overall coherence for which it strives is different: a mosaic of language which serves as a tool of many purposes at once.’

Whereas the colonising discourse, with its Cartesian mannate dichotomy, frames relationships in instrumental terms, the contextual discourse foregrounds the moral nature of relationships — even when it involves the killing of an animal as the source of food or the use of technologies that help insure human survival. This is brought out in Cheney’s observation that...

‘...in the life of a tribal community ... [contextual discourse] must articulate a sense of those processes which bind the community together and to the land; and it must do this in a language which functions effectively to call forth appropriate responses. It must provide a means whereby individuals can come into their own in nonrepressive ways; yet, individual identities must be articulated in a language that makes these individuals intelligible to the community ... the language must also articulate a process of human interaction with the land which insures the health both of the land and community. Contextualised language is tuned to quite specific situations and forges the kind of totalizing coherence with which we have been so preoccupied in the modern world. (1989, pp. 120–121)

To put it another way, contextualized language foregrounds the cultural group’s way of understanding the moral responsibility in all the relationships that are part of daily life. The metaphorical content of the vocabulary will be derived from the animal, plant, and physical characteristics of the bioregion. Metaphors that encode the cultural group’s schemas for understanding moral responsibility will not be derived from a mechanistic root metaphor, as is the case with the colonising discourse of the Information Age. Rather, it will draw upon patterns perceived in the life cycle of the biotic community, and these patterns — the cycles of the salmon, the habits of the wolf, the patterns of the seasons — will serve as the analogues that help humans understand their moral responsibilities. Contextual language, as Cheney describes them, also serve to frame the person’s relationship to community in a way profoundly different from the colonising discourse of individual empowerment within a world community of computer networks.

Understanding human actions in terms of the temporal aspects of relationships, where insuring ‘the health both of the land and community’ takes simultaneous account of past traditions that enabled the cultural group to survive and future prospects, adds another dimension to their way of understanding moral relationships. For Kay, and others conditioned to think that progress is guaranteed through continued technological innovation, there is no reason to limit the self by bringing our embeddedness in a larger mental ecology (as Bateson calls it) into the foreground or to complicate our view of language and thought by suggesting that the epistemology underlying the promise of the Information Age has closed off the multiple ways of knowing and communicating that may be essential to our long-term survival. The ecological crisis, for Kay, does not suggest the need to understand the moral and spiritual roots of the double bind that now characterises modern society; rather it suggests the need for more computer simulations, more data, and more individually generated ideas. This failure to understand that the relationships and patterns that make up an ecology should involve, for humans, a sensitivity to the moral dimension of all relationships seems to be a tragic flaw in Kay’s thinking. The real crisis is not the lack of data or computer literacy, but in the lack of a form of moral and spiritual development that takes account of the interconnectedness of life.

REFERENCES


