Is the Digital Revolution Driven by an Ideology?

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Abstract

The writings of computer futurist writers such as Ray Kurzweil, Eric Schmidt, Hans Moravec, and Peter Diamandis argue that the digital revolution that is "Reshaping the Future of People, Nations, and Business" (to quote the sub-title of Schmidt's book) is being driven by the Darwinian forces of natural selection. What they do not consider is how their thinking, as well as the thinking of most computer scientists and programmers, is influenced by the metaphorical language of their culture. As language both illuminates and hides, the main focus in this essay is on the diversity of cultural ways of knowing that are being lost as people rely more on print-based data, information, and other abstract systems of representation. The assumption of the computer futurist writers that the digital revolution is an inherently progressive force is based on the same metaphorical language that underlies such progress-oriented ideologies as libertarianism and market liberalism. These ideologies, in turn, are based on the Western Enlightenment assumption that traditions are the source of backwardness and a limitation on progress. This same view of traditions, which ignores that the diversity of the world's cultural commons carried forward through face to face communication are the basis of less consumer dependent and less toxic destructive lifestyles that will become more important as the ecological crisis deepens, is a key feature of the digital revolution. The double bind is that the many important uses of digital technologies lead to the widespread indifference about the importance of living cultural traditions that are passed forward face to face and through mentoring relationships. Is the loss of privacy, communication between generations, economic security from being displaced by robots and from hackers, the diversity of cultural ways of knowing—including the exercise of ecological intelligence, to be written off in the name of progress?

Key words: Ideology; Cultural colonization; Evolution; Computer futurists; Oral traditions; Cultural commons

The answer is "Yes" to the question of "Is the Digital Revolution Driven by an Ideology?" This question is likely to come as a surprise for the people who rely upon computers for reasons of personal convenience, such as myself, because of their usefulness in solving difficult problems, increasing productivity and profits, and carrying out other useful tasks. Current thinking among the general public and within the computer science community about the uses of digital technologies is limited largely to how they can be used more widely and effectively. If there is a consensus in this era of increasing armed conflicts, it is that digital technologies are the gateway to further progress and that the so-called digital divide between the users and non-users must bring the latter into the modern world.

If we are experiencing progress in achieving a better quality of life, it would seem pointless to muddy the waters by asking whether the digital revolution is driven by an ideology. Ideologies, such as the social justice liberalism to which most democrats support, the market liberalism of the faux conservatives, fascism, and various religions that function in the same way as ideologies, share the same fatal flaw of not recognizing the world's diversity in cultural assumptions that frame how human with human and human with natural systems are to be understood and valued. That is, ideologies are colonizing conceptual and moral templates for how the world's people should think and behave toward others and the environment. Deviation

from what is prescribed by the ideology or religion often leads to various forms of social, economic and even military sanctions. Given the recent colonizing record of ideologies, how can the digital revolution, with its capacity of enabling people from diverse cultural backgrounds to solve local problems, to educate their children, and to become connected to the Internet and global markets, be understood as a cultural colonizing ideology that claims to embody universal truths?

To get beyond the current ideologically driven surface level of thinking that explains the digital revolution as having at last reached the exponential rate of development that matches Moore's Law, it is necessary to make an important detour into the realm of ecological linguistics. Indeed, if there is a universal process that challenges the certainties of an ideology it is that all cultures are based on metaphorically-based linguistic processes called for mythopoetic narratives, religions, root metaphors, and symbolic constructions. These metaphorical linguistic processes have a history rooted in diverse mythic stories of origins, powerfully evocative experiences, and life-changing analogies where the past is carried forward in vocabularies that the present generation largely takes for granted. In cultures that value innovations that supposedly overturn the traditions of the older generation, the new ideas and innovations actually build upon and carry forward many of the deep cultural assumptions that underlie earlier patterns of thinking.

These patterns need to be understood as part of a culture's linguistic ecologies. Foundational to the West's linguistic ecology are the root metaphors of patriarchy, a human-centered world (or anthropocentrism), individualism, mechanism, progress, economism, and evolution. The root metaphor of ecology is now emerging as an explanatory framework that challenges many of the root metaphors that gave conceptual direction and moral legitimacy to the industrial culture that has now entered the digital phase of globalization. Like all ecological systems, these root metaphors have a history and now play a powerful role by introducing changes in the linguistic ecologies of other cultures. Most importantly, these root metaphors provide the current tacitly held interpretative frameworks for thinking about relationships. They also frame how to understand and solve problems—some of which might would not exist if the culture relied upon other root metaphors. For example, the mythopoetic narrative (root metaphor) of the Quechua of Peru represents nature and humans as in a mutually nurturing relationship. Root metaphors in the West, such as mechanism, are supported by other root metaphors such as progress, individualism, an anthropocentric world, economism (profits), and evolution. The root metaphor of mechanism, which displaced the root metaphors of the feudal era, not only led to reframing how to think about government as based on systems of checks and balances, the nature and functions of organs—such as the heart as a pump, how the brain operates, now to thinking

of artificial intelligence as like human intelligence, and more recently to thinking of human intelligence as like computer intelligence. By relying upon the root metaphor of evolution, Ray Kurzweil, a leading computer scientist/futurist thinker (and proponent of Social Darwinism) is now claiming that humankind has now entered the post-biological phase of evolution, with super-intelligent computers taking over from humans as the world enters the singularity stage of natural selection..

What is especially important about root metaphors is that their supporting vocabularies exclude other vocabularies that would lead to different understandings of reality. The mechanistic root metaphor that now governs agriculture, education, and the organization of work, excludes the vocabularies necessary for giving expression to the sacred, the differences in cultural patterns of thinking and values, what is learned from reliance upon the senses, such human attributes as insights and empathy, and the tacit and taken for granted experiences that vary within different cultural contexts.

The root metaphor of mechanism, and the values that are consistent with this explanatory framework, are now leading to prioritizing efficiency and profits over the need of people to have access to employment. To cite another example, the root metaphor of progress, which is supported by the vocabularies of other root metaphors such as individualism and a human centered world, exclude the vocabularies necessary for naming the traditions that need to be intergenerationally renewed as the twin crises of a rapidly degraded environment and the globalization of the digital revolution continues to contribute to the loss of ecologically sustainable forms of knowledge and skills. Many of these traditions enabled people to live less monetized lives which also strengthened the patterns of mutual support that are the basis of the cultural commons of different cultures. This can be understood as an intergenerational gift economy which was and continues to be passed forward through face to face communication and mentoring. The initial misunderstanding that often occurs when first learning about the cultural commons is that it will involve returning to the lifestyle of earlier centuries. This is due to not recognizing that the cultural commons are different from environmental commons that were enclosed in early 19th century English. The non-monetized intergenerational traditions, skills, and mentoring relationships can be traced back to the beginning of human history, and they continue to exist in every culture, community, family and human relationship—and even in the experiences of those who are committed to transforming what remains of the cultural commons into new market opportunities.

There is another common characteristic of all cultural and natural ecologies: namely, that there are no separate autonomous entities, ideas, things, facts, or individuals. Everything exists within complex webs of relationships and interdependencies. These relationships—whether at the micro and macro level—serve as the information

pathways through which messages (which may be at the chemical, genetic, temperature, metaphorical, behavioral, and different semiotic pattern) are communicated. Within human cultures, the metaphorical nature of the culture's vocabulary influences whether the information being communicated through these relational pathways will be recognized—and how they will be interpreted. Metaphors, in short, can expand just as they can inhibit awareness and understanding.

For example, the root metaphor of progress, when combined with reliance upon the abstractions of the printed word rather than with what can be learned through the senses, now leads to ignoring the importance of many skills and mutually supportive relationships that were, for previous generations, common sense understandings—or what can be referred to as tacit knowledge of shared cultural patterns. Other examples can easily be cited of how the metaphorical nature of language carries forward and reproduces the misconceptions and silences of earlier eras that limited understanding of interpersonal and environmental relationships. For example, the early analogs that framed the meaning of the metaphor "woman" reflected the prejudices of the era that excluded recognizing her as possessing the potential to be a painter, an historian, and generally highly intelligent and more physically fit in certain activities than men. What was being communicated in many male/female relationships was limited to what fit the conceptual framework largely dictated by the prejudices encoded in the language that earlier generations took for granted.

The analogies that framed the meaning of other metaphors are now undergoing change, just as we are starting down the pathway to understanding intelligence as relational and ecological. Less understood is that words have a history. When their meaning is framed by the analogs settled upon in the past they carried forward earlier forms of cultural intelligence as well as the era's misconceptions. The choice of analogs that are ecologically informed about environmental issues and an understanding of the cultural commons can lead, for example, to changing the meaning of wealth from that of possessing money to that of possessing useful skills and patterns of mutual support that strengthen community.

That print is a technology that provides only a surface knowledge of a world that it represents as static rather than as emergent is yet another challenge, given the long history of associating print with literacy, democracy, and becoming civilized. The challenge of recognizing the conceptual framework promoted by print is made more difficult by the way in which print reinforces the abstract theories of Western philosophers and social theorists as based on a rational process that supposedly is free of hidden cultural assumptions. Print-based abstract thinking avoids the complexities of the senses, communal memory, differences in cultural and natural contexts, and the questions that arise when it is acknowledged that the language systems that are the basis of print-encoded cultural storage and communication are based on root

metaphors and mythopoetic narratives. That most writers, computer programmers, and ideologues are unaware of the need to make explicit the tacit patterns of thinking and deep assumptions of their own culture too often results in the printed word representing only a partial understanding. This leads to the all too real habit of assuming what appears in print as a objective and factual account rather than being the writer's interpretation that, in turn, was influenced by the linguistic ecology that was the basis of her/his socialization.

For many Western readers, there is another linguistic convention that is likely to influence whether any of this will be taken seriously: namely, the either/or convention of thinking that excludes the possibility that ideas, technologies, policies, and so forth, may exhibit at the same time short term gains while also leading to destructive consequences at a future time. For example, many new digital technologies represent short-term gains in empowerment and achieving greater efficiencies. However, when considered within a larger context, such as how they contribute to the ecological crisis and to increasing levels of poverty and unemployment among the world's population now moving toward the 9 billion mark, their benefits must then be weighed against the loss of important forms of knowledge, skills, and social justice traditions. And when we reach the critical point where current social systems are no longer able to cope with the dimensions of the crisis, moral judgments that are beyond the capacity of computer systems will be needed.

What is ironic is that two of the most prominent features of all cultures––the use of a metaphorical language rooted in the symbolic history of the culture and reliance upon technologies—are not required areas of study for all students. Thus, the students' current lives and future prospects are being rapidly reduced by cultural forces of which they have little understanding. Yet, their formal education leaves them with the mythic understandings formed during the last 500 or so years when the forces of industrialization began the shift to an individualistic, mechanistic, and consumer dependent lifestyle. Unfortunately, their classroom teachers and professors, who continue to reproduce the interpretative frameworks of their own mentors who understood environmental issues as the responsibility of scientists and technologists—and thus free of cultural influences, failed to provide the educational basis for recognizing that the modern mythic understanding of language as a conduit in a sender/receiver process of communication, and technology as culturally neutral, are not ecologically sustainable.

When we begin to recognize how patterns of thinking and behavior always exist in a relational world, and that the relationships serve as complex information pathways crucial to whether the relationships lead to destructive outcomes (like an ecology of weeds, as Gregory Bateson put it) or contribute to enhancing the life forming and sustaining processes of the Other, it then becomes possible to take seriously the question about whether the digital revolution is driven by an ideology. This question leads to

an even more important question: namely, is this ideology based on cultural myths that undermine the ecologically sustainable forms of knowledge and values of other cultures that have taken a different and, in many instances, a more ecologically informed approach to development?

Leading computer scientists and futurist thinkers exhibit absolute certainty about the nature of the forces driving the digital revolution. But they do not recognize these forces as expressions of an ideology. For them, science provides the best explanation of why these forces are both irreversible as well as why they should be understood as dictating the fate of all cultures. When they are speaking in the language of science, they call this force evolution. And when writing about its impact on other cultures they revert to the high-status vocabulary of their Western culture by referring to these forces as the expression of progress. They exhibit little awareness that they are moving down the slippery slope of scientism. Thus, what they refer to as Nature's process of evolution that dictates that computer intelligence has entered the era of singularity, where human intelligence is being surpassed by computer intelligence, turns out to be the Social Darwinism that has played such an important ideological role in the winner-take-all mentality that dominated past and current periods in American capitalism.

It is important to recognize how they adapt Darwin's theory of natural selection as a way of explaining why the digital revolution is leading to the extinction of the world's diversity of cultures, which are to be replaced by the emergence of a hybrid where super-powerful computers rely upon Western assumptions to collect and process data, identify and solve problems, and generally replace the culturally diverse cognitive and moral abilities of humans. That these computer/futuristic thinkers understand evolution as leading to the elimination of the world's diversity of cultures and to replacing them with the monolithic nature of computer intelligence that is unable to encode and process the tacit, contextual, and taken for granted patterns of different cultures—including the patterns of moral reciprocity, empathy, intersubjective identities, and wisdom traditions—should be one of the warning signs that these leading computer scientists/ futurist thinkers do not understand one of the most widely recognized characteristics of evolution. When the explanatory power of evolution is not based on the Western assumption of a linear form of progress, it then provides a way of understanding that nature depends upon diversity in determining what represents the better adapted genes and behavioral traits.

Another major source of confusion shared by the computer scientist/futurist thinkers is that they do not understand that memes do not have the same scientific basis that genes have in the scientific world. They simply accepted a metaphorical slight-of-hand word trick initiated by Richard Dawkins, and supported by E. O. Wilson and other prominent Social Darwinian thinkers who argue that memes play the same role in the evolution of cultures as genes play in the biological world. The problem is they do not recognize that the use of Social Darwinism, as a conceptual framework for deciding what represents backward and thus less evolved cultures that can be replaced by the globalization of computer-mediated intelligence, is also based on the cultural assumption about the progressive nature of change. For these futurist thinkers, it is assumed that the corporations that rely upon big data, the connected world of the Internet, and technologies that track people's behaviors are more evolved than indigenous cultures that developed place-appropriate technologies, the arts essential to communicating about the reciprocal nature of relationships, patterns of mutual support, and an ecologically informed spirituality that enables them to live within the limits and possibilities of the bioregion. As we shall see, leading computer scientists/futurist thinkers refer to these cultures as backward and moving toward extinction while viewing intelligent self-programming machines, and the virtual worlds they can create, as being carried forward by the process of evolution.

In the mid-nineteen eighties, when digital technologies were just being promoted by computer scientists and the Willy Lomans of the computer industry as essential to students constructing their own knowledge and staying connected with others, Hans Moravec wrote *Mind Children: The Future of Robots and Human Intelligence.* (1988) This book was intended as a wake-up call about how evolution dictates that computers, including robots, were on the verge of replacing humans, with all their physical limitations and inefficiencies. By explaining that the coming extinction of all humans is dictated by Nature's agenda for ensuring that the better adapted survive gave Moravec's statements the appearance of a high degree of scientific legitimacy .

At that time few members of the public were aware that Moravec was helping to lay the conceptual and moral foundations for the introduction of digital technologies created by computer scientists and engineers who were and continue to be largely indifferent to the unintended cultural consequences of their inventions. Indeed, according to the Social Darwinian conceptual framework upon which Moravec relied, the introduction of robots and other digital technologies that reduce the need for workers, and thus their ability to practice a craft and to earn a living, is dictated by Nature's logic. This same logic, and along with the capitalist's greed for increasing profits, also dictates eliminating the benefits and social contracts won in earlier labor struggles.

Other losses that Moravec viewed as a necessary consequence of computers replacing humans in the process of evolution include the forms of intergenerational knowledge and achievements essential to civil societies that have learned to live by social justice principles. Privacy, intergenerational knowledge, skills, and mentoring relationships essential to mutually supporting communities are also part of the taken for granted traditions of some cultures. Unfortunately, these tacit and contextually-based aspects of culture are not what self-

programming computers and robots are particularly good at replicating. Survival of the fittest, the phrase coined by Herbert Spencer to explain a key feature of Darwin's theory, dictates that super-intelligent computers are to replace humans with all their vulnerabilities. Spencer's phrase has now been replaced by the less ruthless sounding phrase of "better adapted," as it is more easily accepted by the public conditioned to equate improvement with progress. And who can be against progress?

Ray Kurzweil, perhaps the most widely recognized and acclaimed computer scientist/futurist thinker, published *The Age of Spiritual Machines* (1990). This book assured, again with the certainty that has become a hallmark of this genre of thinkers, that computers would evolve to the point where they will replicate all aspects of human experience, including having religious experiences. Thus, there would be no reason for humans to become anxious about their coming extinction—which after the final transition would become a non-issue.

Gregory Stock, whose degree is in the field of biophysics, was one of the earliest to predict, to use the subtitle of his book, "the Merging of Humans and Machines into a Global Superorganism" he named "Metaman". (1993) The diversity of the world's cultures, as he put it, "is mostly a thing of the past." The archaic forms of knowledge of these non-Wesern cultures are being replaced by the evolution of Metaman's "ability to 'think' by using a 'brain' that is literally all around us. And that brain contains within it the functional equivalent of a global 'memory' housing all of humanity's accumulated knowledge. Examining the evolution of this global memory," he concludes "reveals its nature and future." (p.85)

It is important to recognize that Stock's Social Darwinism locates the forces of change outside the realm of human decision making. By extending Darwin's theory to include the evolution of cultures, the diverse cultures of the world will have no role in deciding if they are willing to be part of the great extinction that will follow the further evolution of digital technologies. Cultures headed for extinction, like the emerging Metaman, must simply accept what the process of natural selection dictates. And dictate it will! As Stock describes this transformation to human-machine hybrids:"as the nature of human beings change, so too will the concept of what it means to be human. One day human will be composite beings: part biological, part mechanical, part electronic." (p.152)

It is important to mention Ray Kurzweil again, as he has received a number of honorary doctorates, national awards, and large sums of money for his digital inventions. He is clearly a highly inventive computer scientist, and is equally acknowledged as a leading futurist thinker. His book, *The Singularity is New: When Humans Transcend Biology* (2005) not only gives an account of the stages in which humans will be replaced in the process of evolution, but also the approximate dates. That the influence of the theory of singularity that represents a fundamental transition in the evolutionary process from

a human/biological world to that of digital machines is being taken seriously by other computer scientists can be seen in the number of young computer scientists who enroll in Singularity University that is located on a campus near Google, where Kurzweil is one of the leading engineers and innovators.

Kurzweil's reliance upon Darwin's theory of evolution is clearly evident in his predictions about the cognitive take-over by digital technologies. The following represents just four of a long lists of changes that will be brought about as we enter the era of singularity.

With both hardware and software needed to fully emulate human intelligence, we can expect computers to pass the Turing test, indicating intelligence indistinguishable from that of human intelligence, by the end of 2020.When they achieve this level of development, computers will be able to combine the traditional strengths of human intelligence with the strengths of machine intelligence….

> Machine intelligence will have complete freedom of design and architecture (that is, they won't be constrained by biological limitations, such as the slow switching speed of our interneural connections or a fixed skull size) as well as consistent performance at all times. (pp.25-26)

In Kurzweil's version of digital heaven, which he calls virtual reality, we will be able to enter and explore realities that are radically different from the world of culturally embodied experiences. As we enter these virtual realities

> we won't be restricted to a single personality, since we will be able to change our appearance and effectively become other people….We can select different bodies at the same time for different people. Your parents may see you as one person, while your girlfriend will experience you as another. (p.314)

While this last projection of life in virtual reality does not seem much different from what many parents now experience, it is important to recognize that Kurzweil ignores cultural differences, which involve differences in belief and values systems—as well as differences in personalities within these different cultures.

A further example of Kurzweil's reductionist thinking (or what can be referred to as his abstract representation of human intelligence as though it is universally the same for all people) can be seen in the title of his 2012 book, *How to Create a Mind: The Secret of Human Thought Revealed*. One does not have to read beyond the title of the book to recognize the dangerous combination of a person who is promoting a fundamental change in the world's cultures and whose thinking is based on the misconception that there is only one form of human intelligence. This is a chief characteristic of an ideologue.

In the epilogue to *How to Create a Mind*, Kurzweil writes that "the last invention that biological evolution needed to make—the neocortex —is inevitably leading to the last invention that humanity needs to make––truly intelligent machines—the design of one inspiring the design of the other." (p.281) Given that there

are many forms of human/cultural intelligence, and given the hundreds of languages still spoken in the world, the question then becomes: Which form of cultural intelligence will inspire the design of machine intelligence? Will it be fundamentalist Christian, Muslim, Hopi, Buddhist, market liberal?

The title of other books by computer scientist/futurist thinkers also reveals the same assumption that the globalization of the digital culture will lead to progress for the entire world. These include *Darwin Among the Machines: The Evolution of Global Intelligence,* by George Dyson (1998); A*bundance: The Future is Better than You Think,* by Peter Diamandis and Steven Kotler (2012); *The New Digital Age: Reshaping the Future of People, Nations, and Business* by Eric Schmidt and Jared Cohen (2013); *Radical Abundance: How the Revolution in Nonotechnologies will Change Civilization,* by K. Eric Drexler (2013); *Facing the Intellectual Explosion*, by Luke Muehlhauser (2013) and *The Second Machine Age: Work, Progress, and Prosperity in an Time of Brilliant Technologies,* by Erik Brynjolfsson and Andrew McAfee (2014).

Among this latter group, only Dyson unequivocally embraces the Social Darwinian conceptual framework that is such a prominent part of the thinking of Moravec, Stock, and Kurzweil. The others, while referring to evolution, rely more on the Western root metaphor that equates technological innovations with the market liberal way of understanding progress. The computer/futurist thinker's way of understanding progress is not like that of the Western Apache who interpret progress as achieving wisdom by avoiding the distractions of the personal ego and the demands of the external surroundings—including the expectations of others, or that of a Buddhist in attaining a mindful existence, or that of other non-Western cultures less focused upon turning all aspects of daily life into expanding markets and profits.

The market liberal ideology of these computer/futurist thinkers aligns perfectly with Social Darwinian thinking, as they both are dependent upon other cultural assumptions (root metaphors) such as the autonomous nature of the individual, a human-centered (which is to become a computer-centered) world, mechanism, and economism (which holds that everything has an economic value). Other assumptions that support the market liberal ideology include accepting a sender/receiver view of language that hides that words have a history and carry forward the cultural misconceptions of earlier eras (which supports the myth of objective data, information, and ideas such as free markets and private property), the progressive nature of conflict and competition in overcoming what is regarded as inefficient and tradition-bound. These digital revolutionary ideologues also exhibit what Wendell Berry termed the growing imperialistic agenda of science, and thus the silences, prejudices and reductionist thinking that accompany how culture is understood by mainstream Western scientists.

Implications of The Ideology That Drives the Digital Revolution

One of today's ironies is that the computer/futurist thinkers totally ignore what the environmental scientists (who rely upon increasingly sophisticated digital technologies) are reporting; namely, that there is a rapidly deepening ecological crisis. Their silence aligns their thinking with that of the corporate and think tank market liberals who are in denial that the industrial/consumer being globalized is undermining the self-renewing capacity of natural systems. They also share the limitations of the scientists' way of understanding the ecological crisis, which is to promote the development of new less environmentally disrupting technologies. What is being ignored are the cultural roots of the ecological crisis, as well as an understanding of cultures that have taken more ecologically sustainable paths to development. These are the cultures that are to disappear when the era of super computers and global connectedness (singularity) takes over.

Ideologies, as mentioned earlier, are sustained by supporting root metaphors and vocabularies, which also serve to exclude other vocabularies and interpretative frameworks. The narratives supporting the ideology of the digital revolution will be heard differently within different sectors of society—with the medical, industrial, agricultural, military, and educational sectors learning to expect further innovations ahead that will increase their efficiency , problem solving abilities, and profits. What these ideologically influenced narratives will not address are the cultural traditions that have a smaller ecologically destructive footprint and thus should be intergenerationally renewed.

There is a reason for the silence on the part of the computer/futurists that goes beyond the myopia and hubris of their ideology. That is, if their educational backgrounds were to be studied, it is highly likely that we would find that they did not learn about the tacit interpersonal norms and conceptual/linguistic patterns of their own culture—and the many symbolic ecologies that sustain and transform the diverse cultural traditions. Such a study would reveal that they, as a group, think of traditions in the most simplistic and reductionist terms—even though their everyday lives involve the unconscious reenactment of cultural patterns that can be called traditions. Similarly, a study of the educational background of most scientists would reveal the same lack of knowledge of whether the cultural ecologies they participate in on a daily basis contribute to a sustainable or unsustainable future.

There is now a growing understanding that the world, from the micro to macro levels of natural and cultural ecologies, is one of emerging relationships that serve as multiple pathways of information exchange. Digital technologies, aside from being limited by the cultural patterns that are not made explicit, cannot represent

the emergent world of relationships––except at an abstract level where differences in ways of knowing are ignored. Even what is streamed is an event taken out of the context of the cultural ecology that has a history of interactive influences—including the cultural assumptions that frame how the differences which make a difference in relationships are interpreted. When both natural and cultural ecologies are understood as emerging relationships, the ability to recognize what is being communicated through these relationships becomes more critically important. This also requires recognizing how the vocabularies inherited from the past may limit awareness of the information being communicated within and between cultural and natural ecological systems.

A more immediate set of issues that the digital ideologues are ignoring can be traced to their indifference to the changes they are introducing into other cultures. One of the consequences of their formulaic thinking, which leads to equating new digital technologies with progress, results in their not considering the importance of the cultural traditions that are being lost. The push to develop smart technologies that will enable governments to control the flow of traffic, as well as enable the police to engage in real-time law enforcement, is just the start of the computer industry's effort to introduce sensors into all built environments for the purpose of collecting data on every aspect of human behavior. Just as Jacques Ellul predicted in his 1964 classic, *The Technological Society,* technological progress in the West will move from helping to solve problems, including crimes, to anticipating and instituting ways of controlling how they will occur in the future. This shift on the part of technocrats from responding to the diversity of people's culturally influenced behaviors to creating digital systems that limit their behaviors in ways that fit criteria that have not been determined by the democratic process, but instead by the ideology that interprets how the data is to be used to create more efficient systems of control, can be seen in the recent efforts of European officials to require all imported cars to feature a built-in mechanism that will enable the police to stop vehicles remotely. This approach to progress leads in turn to asking whether collecting data from sensors that keep behaviors in every part of the household under constant surveillance, which will be justified on the grounds that the data will lead to people's ability to make healthier and safer decisions, will be used by corporations to promote their life-enhancing products. That is, is there an economic interest that promotes these total surveillance systems, or is it the further reach of the National Security Agency?

In *To Save Everything, Click Here: Technology, Solutionism, and the Urge to Fix Problems that Don't Exist*, Evgeny Morozov cites several examples of technological progress based on the assumption that anticipating and correcting future misbehavior of people must be build into the technology. Apple, for example, recently patented technology that deploys sensors inside the smartphone that measures whether the car is moving,

and if the person is both driving and using the phone, the phone's texting capabilities will be blocked. Another example of bringing behavior in line with the norms of the people who create the technology is the Project Mobil system being created by Intel and Ford. It involves a face recognition system that will prevent the car from starting and will send the picture to the car owner if the system does not recognize the face of the person turning on the ignition system (2013).

The same drive to use massive amounts of data, and the connectivity between digital systems, can be seen in the current effort to reduce the depth of knowledge that students should be learning to the supposedly objective bits of information and facts that can be machine scored. The data from this reductive process can then be used to determine the teacher's effectiveness in raising test scores. The cultural issues that cannot be reduced to measurable data, including the diverse ethnic and economically backgrounds of both the teacher and students, are simply ignored when in reality they may have the greatest influence on student learning.

The massive amounts of data now collected as part of the national effort to identify potential terrorists, even when the definition of who is a terrorist is open to ideologically driven interpretation, is already limiting the expression of ideas critical of the excesses of corporate America. As data is only a surface and fragmentary representation of the cultural context from which it is taken, it is also open to being interpreted differently—depending on the interpretor's ideology. And if the ideology is based on assumptions that experts have the best answers, and on abstract assumptions about the progressive nature of technologically driven and monitored change, then the next step is to incorporate the principles of behavior modification. That is, the system provides data on a person's behavior, shows how it compares with the performance of others, and provides the winner with a tangible reward. The use of behavior modification techniques represents a top-down system of control that is justified by the experts in the name of progress.

As briefly noted before, the modernizing ideologies driving the digital revolution continue to carry forward the Enlightenment misunderstandings about the nature of cultural traditions, particularly those traditions of the cultural commons that enabled people to live more community rather than individually-centered lives. The importance of the cultural commons that continue today to be passed forward through face to face communication and through mentoring relationships—which encompass the culturally diverse approaches to food, ceremonies, creative arts and craft knowledge, knowledge of the life cycles in the local bioregion, the traditions of civil liberties slowly gained and easily lost, and even language itself—enable people to live less consumer dependent and thus less ecologically destructive lives.

The problem with the Enlightenment thinkers who helped to put the West on the pathway to integrating

science, technological innovation, and the industrial/market system of production, is that they were unaware of environmental limits and thus were unable to recognize what most computer scientists still do not recognize. Namely, that the further enclosure of what remains of the cultural commons by digital technologies, especially in an era when progress is understood as the further computerizing of the workplace, will lead to more poverty and eventually social unrest that will require the emergence of a Stasi-style police state where everybody is being watched. The data that provide the government all it needs to know about people's lives, as well as the tracking technologies and military style hardware used by law enforcement, are already in place.

The deepening ecological crisis— which is leading to shortages of water for agriculture and even for meeting basic human needs, the extreme changes in weather that are devastating lives, and the changes in the chemistry and temperature of the world's oceans (along with over fishing) that are reducing people's access to protein—is accelerating. The deep cultural assumptions that gave conceptual direction and moral legitimacy to the first Industrial Revolution, and now to the second digitally driven revolution, should be the focus of educational reform, especially at the university level. These assumptions originated in the abstract thinking of Western philosophers and social theorists, and achieved a status that placed them beyond questioning as scientists, technologists, and capitalists relied upon these assumptions in creating new sources of wealth, personal conveniences, and higher standards of health and longevity. These assumptions were based on the idea that natural resources are unlimited, and if limitations do occur, scientists will be able to create alternatives. In the West, the dominant idea was that progress would not be limited as long as scientists, technologists, and capitalists were freed from the traditions of the past. The problem with this way of thinking is that it led to an indifference to understanding how to make the transition to an ecologically informed form of consciousness, even though the market system and the new digital technologies contribute to changing consciousness in ways that are even less ecologically sustainable.

Basically, the digital revolution perpetuates the limitations found in the thinking of the Western philosophers and social theorists who provided the original conceptual and moral scaffolding that supports what has now become a global economic and technological agenda. These philosophers and social theorists relied upon print to communicate their ideas, and in the process ignored that the meaning of words they used were framed by the analogs settled upon in the past, and that the new meanings, such as how to understand "free markets", the nature of "property", "data", "woman" and so forth were the outcome of debates about what constituted analogs that met the criteria of progressive and scientifically informed thinking. To reiterate a point made earlier, the cultural

emphasis on literacy, and the now on the empowering nature of print that is read on the compute screen (which does not substantially differ from the print appearing on paper) hide what is now needed as the ecologically crisis deepens. Namely, how to recognize that the meaning of most words appearing in print (as well as spoken) has a history, and that they encode many of the misconceptions and silences of the earlier eras when the analogs were settled upon. These misconceptions and silences included the failure to recognize environmental limits, other cultural ways of knowing (including cultures that had developed different forms of ecological intelligence), and thus the necessity of making the cultural turn away from the current consumer-dependent lifestyle—and toward a more cultural commons-centered lifestyle.

The printed words appearing on the digital screens, which reinforce the mistaken idea that communication is like a sender/receiver conduit through which ideas and "objective" data and information are passed, also marginalize awareness of the metaphorical nature of language—including how earlier misconceptions become the basis of the individual's supposedly autonomous thinking. As more of the formal educational processes is mediated by cultural amplification and reduction characteristics of digital technologies, as well as being mediate by the mindset of the people whose thought processes appear on the screen as objective and factual, there are few professors and even fewer classroom teachers who can explain to students how print, including English nouns, are unable to represent the emergent, relational, and co-dependence of the cultural and natural ecologies that make up their world. Both print and English nouns are unable to represent the full and emergent nature of living contexts where there are no isolated events, ideas, things, data. Everything, when understood within an ecological framework, is emergent and responsive to the information/semiotic rich exchanges occurring in living systems. Gregory Bateson's reference to as the "differences which make a difference" is another way of understanding that life sustaining processes, that is behaviors, introduce difference to which the Other responds, and the response of the Other introduces differences that, like a wave moving across a pond, serve as sources of information that bring about changes in the entire cultural ecology.

And how many professors who find the digital technologies highly useful in their research, and in communicating with colleagues on a world-wide basis, can explain the metaphorical nature of language, and how different cultures are based on different root metaphors and mythopoetic narratives that in many cases lead to valuing oral forms of renewing intergenerationally knowledge and skills. Many of these cultures live on the margins where there is no room for experimenting with new ideas and technologies. The allure of becoming modern by relying upon technologies leads the youth in many of these non-Western cultures to reject the

knowledge and skills of the older generation as sources of backwardness. Unfortunately, they do not realize that the unemployment levels among their peers, which reaches 40 percent and above, may have something to do with becoming dependent upon a money economy and an increasingly computerized industrial system that can produce massive amounts of consumer goods. Traditions, which progressive ideologues dismiss as obstacles to achieving a better future, are for these cultures the basis of a subsistence existence, and a cultural commons that may be rich in the arts and patterns of mutual support.

The loss of privacy, craft knowledge and employment opportunities as more forms of work are computerized, historical memory and awareness of traditional patterns of mutual support, and even the awareness that people possess levels of self-reliance and good judgment that preclude the necessity of being under constant surveillance, suggests that the progress-oriented ideology of computer scientists has its roots in their failure to understand the cultures into which their technologies are being introduced. If they understood a basic characteristic of cultural traditions, they would then possibly be aware of that when a tradition is overturned as a result of a technological innovatiom, then it cannot be recovered. For example, the tradition of privacy, which has now been lost to the progressive thinking of computer scientists, cannot be recovered. Nor can the personal confidence previously associated with engaging in private economic transactions be recovered now that the digital technologies enable hackers and the unemployed sitting in internet cafes to steal the identity and resources of others. And who is going to take responsibility when cyber attacks disrupt the financial, energy, transportation, and other critical infrastructures? This problem cannot simply be dismissed by claiming that progress always involves unintended consequences.

There have been many genuine gains from the digital revolution, but at the same time it is leading both to new forms of personal fear and insecurity, and to an inability to recognize that one of the realities that the ecological crisis will force everyone to recognize if we are to avoid the endgame of social chaos as systems begin to fail. The reality is that we need to begin thinking about conserving habitats, species, the forms of the cultural commons that reduce dependency upon consumerism and the levels of toxins it introduces into the environment. And this imperative leads back to the current failure of computer scientists and programmers to understand how language both illuminates possibilities while and hiding others. Whether it is the vocabulary of libertarianism and market liberalism or the vocabulary of conservatives in the traditions of Edmund Burke or the environmental/cultural conservatives in the tradition of Wendell Berry and Vandana Shiva requires mindfulness and thus caution in considering the long term implications of new (especially abstract) ideas and innovations—especially when the innovations leads to economic advantages for the groups

hiding behind the rhetoric of progress and other god-words. So far the dominant ideology driving the digital revolution only illuminates the short term gains and leads to ignoring what needs to be conserved if there is to be a future for humankind.

These cautionary observations are not likely to be taken seriously by computer scientists, venture capitalists, and corporate CEOs constantly in search of new market opportunities. Many of these progress-oriented thinkers have made vast fortunes from the combination of commercial hype, blind faith in the myths of market liberalism, and the creating of digital technologies that are embraced by special interest groups seeking more effective ways to achieve their agendas —including corporations and the surveillance agencies of government. The public's addiction to be connected to the Internet has also contributed to their fortunes. The computer scientists' libertarian and market liberal way of thinking about the causes of poverty may also figure into why computer scientists are working to computerize as many skills and cognitive functions as possible. With the recent prediction that 47 percent of jobs in the West may be replaced by digital technologies within the next two decades, it would seem that there would be a debate among computer scientists about their contribution to world poverty and the growing social unrest.

Similarly, with the increasing public concern about the development of digital technologies that collect data on nearly every aspect of human behavior, and with this data stored by governmental agencies and used by corporations to promote their products, it would seem that computer scientists would begin to ask questions about whether there are moral and political guidelines that should limit their research and development. Their collaboration with the pharmaceutical industry and with scientists in the field of brain research, where one of the primary goals is to develop digital technologies that will bring more aspects of the individual's thought and behavior under external control, should also prompt an ongoing debate about the moral and political responsibilities of computer scientists. Some of these new technologies lead to genuine benefits. But many, such as the efforts to anticipate the thoughts and behaviors of others, are genuine threats to our traditions of civil liberties. The computer scientist/futurists who are the most dogmatic Social Darwinian thinkers are totally silent on this issue.

The writings of the computer/futurist thinkers, as well as the promoters of providing a computer for every child in the world, reveal a total lack of awareness of how digital technologies undermine the face to face, orally communicated symbolic traditions of non-Western cultures. As pointed out earlier, the virtual world of the Internet is also a world of abstractions that only connect in highly selected ways to those aspects of everyday life that have been made explicit, and experienced from the limited perspective of an expert whose real agenda

is not always known. The complexity of information communicated through embodied relationships, which range from being able to respond appropriately to the cultural norms governing the tacit patterns of footing and framing that occur in all interpersonal relationships to the wealth of intergenerational knowledge that sustains the non-monetized traditions of the cultural commons, are now seen by many older members of these largely orally based cultures as being subverted as their youth become more dependent upon digital technologies. In effect, the globalization of digital technologies and the market system of production and consumption are being seen as a form of cultural and economic colonization by many adults who still possess a memory of their pre-digitized past. Just as many in our society would engage in armed resistance if Sharia law and a tribal system of government were imposed on our country, it should not be surprising that the modernizing agenda of the digital/market ideologues is also being resisted. Defeating the armed resistance to the West's colonizing agenda actually serves to increase the profits of our defense industry and the computer scientists who are now an indispensable part of this industry.

SUMMARY

The issues raised here should be part of a national conversation—indeed, an international conversation. Given how the current system of Western education continues to privilege the patterns of thinking and values that perpetuate the now digitally driven industrial/consumer dependent culture that is increasing unemployment, real poverty associated with the lack of protein as well as the poverty that accompanies the loss of the local cultural commons, and changing the chemistry of natural systems, it is hoped that this conversation will be given more than token recognition. The real hope is in the move toward local community centered approaches to growing food, becoming energy independent, practicing local democracy, revitalizing the cultural commons that also include the hard won traditions of civil liberties and social justice achievements, and the moral language governing relationships within the local cultural ecologies and those of the larger natural world. The focus would then shift from assuming that technological and profit-driven progress is the way forward to recognizing that we need to make conserving the intergenerational traditions that are ecologically sustainable integral to how we understand progress—which ultimately cannot be separated from an ecological sustainable future.

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