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Technology: The Future of Our History

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Today we are experiencing unprecedented multiple and interfacing cultural revolutions that center in technology. In what follows I will examine some implications of this continuing discourse of civilized life which gives direction to the human project. Throughout history, with the doubtful exception of "the age of faith", people have tended to think of their own time as one of crisis. Certainly the present age is no exception if what we read in the newspapers and see on television does not merely cater selectively to public craving for violence and scandal. This circumstance itself raises two crucial issues relevant to our central question concerning the revolutionary connection between culture and technology: why are we seemingly addicted to the media viewing violence and the seduction and secreting of scandal? And does our shared reality now consist in what is media-monitored to public network consumption? That is, is social reality what the media continually re-describes, and is truth what the media continually re-inscribes? I believe the answer is yes to both questions, and this in itself provides us with an important key to social reality: we have become primarily a "spectator culture." As media consumption becomes part of the routine of life, the very experience of perception becomes a second order language of visual aural, and print modes. Our collective cue to shared reality-- whether of weather or war, of recording rape or rendering rap—is experienced in and through media presentation. We look through the media at the world: reality has become what we frame and collectively experience on television and access though internet.

There is nothing especially novel or new in this: the history of social reality has always been a function of the permutations of language usage and communication. Marx

put it clearly for the modern age: whoever controls the means of communication, controls reality. The ancient Greeks already knew that language frames reality—understood that we look through our shared language at the world, that, e.g., we learn our values and become socialized *as* we learn our natural language. The point has an added dimension as we have come to understand that the sciences are also languages—that they form refined extensions of ordinary language for specific purposes. Moreover language does not merely represent reality, but is an instrument that constructs it. At the advent of the modern age, Francis Bacon scripted the future in noting that the value of science is not that it yields truth, but rather that it generates power and control. Perhaps politicians first discovered what science now confirms, that while human beings may lack the gift of predicting the future, we are clearly empowered to produce it. Alexander's strident severing of the Gordian knot with his sword rather than face the unraveling frustrations and failures of his precursors was portentous for the future in similar ways. Marx recorded it prophetically for the modern era: the point is not to understand the world, but to change it.

The fact that reality is made, not found, constructed, not discovered, decided, not divined for better or worse is the wisdom with which we must now live. This fundamental fact of changing and changeable nature, reality, and truth is what shapes the human project and prospect, and is what will decide the history of our future. And at the heart of this turmoil is the medium of technology: the *logos* of *techne*, the logic of the theoretical and productive arts. The discussion of the convergence of technology and culture that follows will focus on aspects of the "information revolution" consequential for our present view of reality, and so our future projects and prospects.

Sometimes the past seems a better time, an age of innocence and simplicity, community and nobility…and we may be led into a romantic nostalgia for another time. This can be harmless enough, a brief respite from the sound and fury of present struggles. As long as it is brief and only a respite, then we can return to the unsentimental business of engaging the present with the history of our future. Much of the record of our cultural history suggests that human beings tend to be ambivalent toward their own time, thinking of it as one of both crisis and indecision and of the future as both portentous and dangerous. The humanities and arts, as a source of expression and conservation of the values of culture, in times of perceived crisis may become a comforting bed of sand in which to bury our collective heads. The Victorian poet, Matthew Arnold, in an age that seems to us now to have been solid and conservatively predictable, famously expressed a sense of impending crisis of the future stretching out as a time in which the best lack all conviction while the worst are full of passionate intensity. Crisis is, of course, not a description of things, but a perception and reaction to them. The world and life are, in fact, processes in time, where time itself is only chance and change. We would like to control time, we cannot, and any project so constituted must fail—we can only be usefully, creatively in the flow of it or not. We can try to set ourselves against it, pretend it does not go on, and so be lost, but that is never really an option.

I want to set out some of the parameters of where time and change and chance seem to be leading, some of the possibilities the present revolution in technology is opening up to us. There are no logarithms to assure control of time, but we can surely see opportunities it presents, see ourselves and our times as a presentation of possibilities. What must we do to understand and profit from this cultural juncture?

The human project has been an emergent phenomenon, a product of the many historical cultures that we inherit. We are inclined in the West, of course, to consider the most important generative sources to be Hebraic and Hellenic culture. In terms of the modern emergence and dominance of scientific culture the important initial index is the period of classical Greek culture centered in the idea of *logocentricity*. That conception of the human being as a rational animal and of reality as wholly accessible to reason defined reality as rational, universal, objective, and unchangeable. This view of the human and the real is deeply set in the ordinary language of ordinary lives--it constitutes the web of belief within which "normal" intercourse operates. The problem is, however, that it is a fiction, a functional social mythology that fails to record what regulates the defining higher activities of intellectual life—the extraordinary and vital contexts and languages of science, art, and literature.

It is sometimes now put that we live in a post-modern world, that is, post-enlightenment era. There is a kind of relentless philosophical effort to dismiss as outdated that cultural perspective which believed the world to be solid and permanently "out there", that operated on the conviction that through knowledge (such was the optimism of early positive science) we would inevitably discover more and more of reality and hence achieve indefinite progress and prosperity. This was the initial technological agenda of modern science. That agenda of the empowerment of knowledge is still in place, but little else remains of the confident humanism of the enlightenment. Various "prophets of suspicion" which include Nietzsche, Marx, and Freud, have undermined the cultural assurance about a given, knowable, predictable and dependable human nature. The skeptical debunking of traditional mental and social worlds brought

with it a re-description of cultural reality in which man is primarily an irrational animal (Freud), and in which there is no language or social or moral point of view free of ideological bias(Marx), and in which every social, political, moral or religious expression or policy is a veiled will to power (Nietzsche).

Similarly, and wholly consonant and resonant with these cultural transformations of value, the physical and mathematical sciences have abandoned or revised the hope for a fixed Archimedian point of reference. Obvious examples of the modern revolutionary paradigm shifts in sciences are found in the shift in astronomy from Ptolemy to Copernicus: the earth, no longer the center of the universe is not even the center of a minuscule solar system within a smallish galaxy of which there are countless others. Perhaps the most secure foundation of all traditional knowledge had been classical geometry--recall the famous motto over the door of Plato's academy "*Medeis ageometretos eisito*"--Let no one ignorant of geometry enter. The self-evident observation that the shortest distance between two points is a straight line surely still serves ordinary discourse as the clearest of truths, but one which we now know is simply not true in a sufficiently large system like the universe. In such contexts a straight line is defined as a segment of the arc of a circle whose radius is infinite. In simpler terms, we measure distance in space with light, which "bends". Or again consider the intuitive geometrical "truth" that parallel lines never meet. In non-Euclidean geometry of course, they do so. Einstein's revelation of the special theory of relativity in which time and space, matter and energy are relative and interchangeable, the paradoxes of Quantum mechanics, the MichelsonMorley experiment which led to the Heisenberg indeterminacy principle...all point to the circumstance that the very means and method that was to

secure our knowledge and understanding has utterly uprooted it, or at least redefined it as possibility, not certainty.

There is, fortunately, ample precedent for cultural adjustment to upheavals of the most radical kind. Cultural sensibility has survived the shock being displaced from the center of the universe with the Copernican revolution, the disappointment of losing the status divine creation, losing rank even as a culmination of evolution within the Darwinian transgenesis. Religious language and perspectives persist in traditional convictions, of course, alongside the above cultural transformations. Ways likely always will be found to accommodate ordinary sensibility to the accelerating revolutions in which intelligent machines begin to dissolve the mystery of the last threshold of the human mystique, the mind itself. From a positive and optimistic point of view, prior revolutions—for example the first and second industrial revolutions that extended the physical capacities of human beings—generated a parallel cultural response to conditions that turned social life inside out. The information-revolution is already extending the mental capacity of human beings. It may turn out that it will not be so difficult as once imagined giving up the idea of the uniqueness or superiority of human life, however it will require a sustained humanism to withstand the idea that this in any way cheapens or degrades it. Although human beings may not be the culminating achievement of evolution any more than the special creation of a loving God, the earth is a sustaining source, the universe is an exciting place to be, and moreover, these are the limiting possibilities of the human condition.

From a cultural standpoint, we may mark the gradual mutations in human self-understanding by some of the rubrics under which man has claimed identity: the most

general and pervasive self-calling is *Homo Sapiens*--a creature distinguished by the capacity for knowledge. But rivaling or supplementing man as knower is man as maker: the conception of human genius as *Homo Faber*, transformer of earth into world, time into history, a conception common to both Hebraic and Hellenic thought—in the Greek genealogy, the emergence of chaos into cosmos, in the Hebrew script of *Deus Faber*, the creator God. In a fundamental way, the conception of technology—*logos* and *techne*, the method of art, the logic of control—is the fusion of these two cultural conceptions into man as intelligent maker of intelligible worlds. The post-modern era has only introduced the difficulty that not all the worlds of human making are consistent. There is no fit of the whole, no whole to fit, and we know now in the ignorance of our Socratic wisdom that there will be no fit, that wherever we go in the universe we will only and inevitably come up against the limits of our own minds and inventions. This revolutionary insight characterizes and projects the extraordinary culture of our future.

There are two historical self-callings that seem companionable sources of resolution to the present cultural crisis: *Homo Hymbolicum* and *Homo Ludens*—the human being as symbol maker and game player. Arguably, innovations in cybernetics that have computerized and produced revolutionary forms of artificial intelligence is attributable to the imagination of play and symbolic games. The serious playfulness in technology creates the powerful instruments of commerce, communication, scientific research, artistic and musical innovation, entertainment, and war-- toys and tools that develop artificial languages far more powerful than natural languages. The play of visual imagination in the electronic arts, for example Moog and video synthesizers and the

emerging technologies of computer generated virtual realities open new possibilities in both the conception and communication of ideas.

What seems most at risk from transformational technology for traditional culture is the loss of a stabilizing center of human purpose, utility, and interest. Intelligent machines now accomplish in an hour computations that would require several lifetimes of a person; machines play games and through feedback loops improve their strategies as they play. There is no reason to doubt that machines will exist that search out their own questions, pursue their own projects of learning and inquiry, and so begin conceptually to move beyond the boundaries of the initial programming control of the operator. In so doing *Homo Sapiens* seems not merely to be extending his own intellect but creating a superior competitor --adding the unnerving chapter of Hal, to the nightmare text of Frankenstein.

It is difficult to predict the human prospect that awaits because in an important sense and for the first time there is neither clear nor linear direction, no limiting "human" control: we seemed loosed in the universe in ways that threaten to break with our accomplished species-history of adaptation. In Freeman Dyson's expression, we have disturbed the universe in irreconcilable ways. Traditional values to this point have had in common a purposeful *telos* or end directed to human conquest of, or reconciliation with, world and time. This has accounted for the coherent cultural imprint of politics, law, morality, art, business, even myth, literature and religion. But that tradition has been turned on its head: we have broken both the atomic and genetic codes; we can do what Einstein said even God would not do: play dice with the universe.

The emergent culture, whether it is clearly circumscribed or not, is one without a given future, one in which reality is not stable, in which there is no human nature to set limits, no logic that structures a coherent universe. We are, in the famous words of the poet, met as on a darkling plain where ignorant armies clash by night, or, to reverse in paraphrase a famous metaphor to play, we are to universal norms of life as are wanton boys to flies--we kill them for our sport. The problem of a technological culture is not the spectre of a godless or inhuman universe—although such a worry may be simply an old fashioned way of expressing genuine concern for the alienating tendencies implicit in the cryptic specialized languages of science and technology. The problem is rather, to use an ugly expression, the indiscriminate proliferation of polymorphous simulacra, in which the very concept of reality disappears through the skylight. A culture is emerging in which there is no reality, or in any case no clear distinction between what is real and what is apparent, where, in the final analysis, there is only the analytic of various games, only the awesome possibilities and consequences of play.

Where does this view leave us? Not, I hope, among the malcontents of the 20th century railing against a brave new world beyond our comprehension much less our own making. With even a realistic picture of the discontinuities of history, culture, and science, we may reasonably be optimistic about the future –albeit, this is a matter of choice and comportment, not a conclusion. But this will be a culture of *what*? One poetic metaphor, consistent with the above, conceives of a vision out of *Spiritus Mundi*, which asks the ominous question: "And what rough beast, its hour come round at last, slouches toward Bethlehem to be born!" The cultural vision I am suggesting is less profound, and certainly less ominous, though full of the same uncertainty. It is one of temporary and

transitional worlds fashioned by *Homo Ludens*: prodigious and prolific children at play, breaking the bonds of Prometheus. No longer haunted by the *spectre* of Faust, new-born bolder beings are cut loose upon time and chance and change—creatures of chaos no longer constrained by the metaphysics of a universal or eternal order. In this very brave world of the ever new there is only the attraction and romance of power, not invested in the security of a cosmos, but only searching out the possibilities of what is not yet.

With such a culture, we seem to have come full circle. If there is a perceived problem, it is certainly not one of a failure of technology-- it is succeeding beyond measure. Detractors have expressed concern over the cultural dominance of an emergent technology in which the tail wags the dog. A slightly more realistic worry is a bifurcation of culture—the familiar model is C.P. Snow's famous "Two Cultures" description from 1959—in which the creative energies of human community are divided between a scientific technological culture, in opposition to a culture which identifies itself as humanistic. The first is committed to the methods and models for the control of things, the other committed to modes of enrichment for human life. This proposed schism needs either debunking or, where operational, needs breaking down. Such a division, where it exists, is based on an historical misunderstanding that can and ought to be changed. Hopefully there is sufficient data on the contradictory implications of any application of technology to undermine the exclusion of the human factor in any fundamentalist ideology of technological progress. Consider only the obvious disturbing and self-explanatory conjuncts of recent experience: automation-unemployment; industrialization-air pollution; flurocarbons-ozone depletion; synthetics-Love Canal; lasers-Star Wars; nuclear power-Three Mile Island; atomic fission-Hiroshima.

Technology, as the Greek word "techne" indicates, is never an appropriate expression for an end, but always and only a way and means, systematically appropriating and transforming the natural and necessary to the human and free. As culture seemingly becomes more and more a matter of technology--that is, as it forms our very consciousness as well as our worlds --understanding must overcome a faulty and factious myth of divided cultures. This is itself a task for communication and education, one that the technology of information theory and practice hopefully will itself overcome. Appropriate in this context is a reminder from computer expert and enthusiast L. Oettinger, author of *Run Computer Run*, that information theory and technology are not a panacea for all our problems, not even for all our educational problems, that technology can finally only tell us at best what can be done, not what needs doing. The latter is a "human problem" and so, presumably, requires the full complement of human resources past, present, and future. Obvious problems related to the immediate field of technology are those of the distribution of limited resources, the priority of funded projects for research against the continued crippling effects of poverty, of prejudice, of race, of how to establish wants against needs in response to the biological and social lotteries.

There are two additional reminders we should register particularly concerning what has not been addressed in this essay. The first is compressed in the line of the poet e. e. cummings: A world of made is not a world of born. Whatever positive comportment we manage toward technology, natality is still a constituting value of and for the human. The second is a paradox from Edith Nesbit's *The Magic City,* a child's story that becomes a kind of allegory for the logic of technology. The law of life in the magic city is that if you wish for anything you can have it, but there is a special rule about machines: if

anyone wishes for a piece of machinery, he is compelled to keep it, and go on using it for the rest of his life. The logic of this rule is the technological inverse of Humpty Dumpty but with the same effect: not all the kings horses can unyoke from existence the terrifying fact of the nuclear bomb or the awesome prospects of genetic engineering. The trick will be to keep these prodigal effects from generating paralysis or a failure of positive nerve in the creative continuance of culture.

Technology is the wide open door to the magic city in which we now live, with our powerful toys, prodigious imagination, and regrettably, still primitive instincts and passions. It is a fortunate aspect of the power of human imagination that it is tempered by collective memory. Since the Greeks, civilized life has constituted an acknowledgment that freedom and responsibility are correlatives, and that freedom can only exist under law. Even if we now concede that our future is open, that the genius of our nature is play, that physics, physiology, economics, religion, and law are all only languages, games, multiple perspectives from which to view changeable realities, the fragile peril of our existence recommends an aspiration to common rules, even as the games change. Friedrich Nietzsche wrote of the three metamorphoses of the human spirit: how the spirit becomes a camel, the camel a lion, and the lion finally, a child. In the journey of the human spirit the first task is the burden of endurance "I can", the second the boldness of affirmation "I will", the third the simplicity of innocence "I wonder…"

These are different but essential kinds of strengths for the immense journey of our species that requires not only changes and metamorphoses, but also the preservation and utilization of all our collective wisdom and strength. We need the discipline and endurance of the camel, the courage and affirmation of the lion, and finally, in all its

fragile vulnerability, the playful aspiration of the child, the purist form of possibility of potential, of power. This is what and where we have come to. The future is where it has always been: in the hands, hearts, and brains of children-- hopefully disciplined, courageous, creative, and wise children.