Cultural Dominants and Differential MNT Uptake

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Can civil societies absorb the impact of microsystems and nanotechnology (MNT) without degenerating almost instantly into Hobbesian micro states, where the principal currency is direct power over other humans, expressed at best as involuntary personal service and, at the worst, sadistic or careless infliction of pain and consequent brutalization of spirit in slaves and masters alike? It is a disturbing prospect, more worrying than crazed individuals or sectarian terrorists. Are we, indeed, doomed to this outcome through frailties in our evolved nature, unsuited to such challenges, or perhaps to the rapacity of the current global economy?

A deeper question might be this: even if we assume that rich consumerist and individualist First World cultures like the USA might be prone to such collapse, is that true of all extant societies? Might more rigid or authoritarian societies have an advantage, if their citizens or subjects are too cowed by existing power structures to dash headlong into lawlessness? Might technologically simpler and poorer societies, possessing fewer goods to begin with and perhaps having fewer rising expectations, rebuff the temptations of MNT? Or might they seize upon such machines eagerly, but distribute them and their cornucopia, if only locally, on models of community or tribe unfamiliar to us in the West?

These seem to me extremely important issues that will require concentrated and imaginative study by economists, sociologists and anthropologists. Nearly half a century ago, the brilliant science fiction writer Damon Knight (1922–2002) published a parable salient to one possible sheaf of outcomes arising from successful and cheaply available molecular nanotechnological compilation of goods from cheap feedstocks. In his brief novel *A For Anything*,[1] a radical device—the Gismo—duplicates any object within its field, including human beings. It needs no feedstock supply, and draws power from batteries, thereby apparently breaching conservation laws. This premise, although invalid given our current understanding of physics, fails to dispel the force of Knight's allegory, since when matter compilers eventually turn information and cheap feed stocks into virtually any desirable good, the more disastrous consequences portrayed by Knight will actually become feasible, unfortunately.

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[1] Damon Knight, *A For Anything,* 1965, New York: Walker Publishing Co. 1970; as *The People Maker* 1959; short story "A for Anything", *The Magazine of Fantasy and Science Fiction*, Nov. 1957.

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Given the exponential proliferation of Gismos that apparently provide everything people need without their working for it, including copies of the Gismo and its batteries, ordered western society collapses almost instantly. Water can be produced out of nothing (the "quantum vacuum", perhaps), greening barren lands; plans to create spacecraft that generate their own fuel in flight seem set at first to remake the entire solar system. Melodramatically yet plausibly enough, alas, Knight projects an almost instant imposition of martial law and its failure, then, worse yet, general breakdown into lawlessness, and acquisition by the brutal and canny of slaves, or "slobs", who can be copied at will when they "wear out". Within half a century, America sinks into a kind of feudalism where nothing, in effect, ever again changes, where innovation seems pointless if not intolerably disruptive.

Presciently, Knight realized that this kind of stable stagnation requires more than a simple duplicator, and added the proviso that Gismos can produce "protes" or "arrested prototypes", "a gnarled lump of quasi-matter that could be stored in a pigeonhole, and would keep forever" (27). When an "inhibitor" is activated, the prote provides the information necessary to generate a complete copy of the original. In effect, the Gismo is equivalent to a nanofactory, using storable algorithms, although protes have the disadvantage of not being digitized and hence having easily transmissible information.

The question *A For Anything* raises is perhaps one for specialists in cultural change and diversity. My own specialties are discourse theory and science fiction, so all I can do here is diffidently suggest certain possibilities for analytical approaches that are currently unfashionable in the academy and in the business world, but might be of use in probing the unknown. In doing so, I draw upon schemata advanced equally diffidently in my book *Theory and its Discontents* (1997),[2] and a range of overviews of individual and culture conveniently summarized in several books by Ken Wilber, Don Beck, and others of their school.[3] Leaving aside the more metaphysical/ "mystical" aspects of his thought, Wilber has usefully condensed the work of some hundred specialists in a number of disciplines to yield a model of cultural phases.

To simplify brutally, Wilber and Beck propose that each society tends to segment, both through time and within a given period, according to a sequence of developmental stages. For shorthand, these are color-coded. The earliest—though not the "simplest", each being as complex as the rest—is Instinctive, directed to brute survival (beige), followed by tribal Animism (purple), impulsive Egocentrism (red), disciplined Authority (blue), managerial/ scientific Strategic (orange), communitarian Consensus (green), multicultural Ecology (yellow), and a sort of new age global Holism (turquoise), with perhaps several transcendent states beyond this highest level. These overlap to some degree at least with my own suggested cyclical cultural dominants, and several key stages match up with "Three Systems of Action" by Mike Treder and Chris Phoenix.[4]

Treder and Phoenix note three significantly different systems of response for social

[2] Damien Broderick, *Theory and its Discontents,* Melbourne: Deakin University Press, 1997.

[3] Ken Wilber, *A Theory of Everything: An Integral Vision for Business, Politics, Science and Spirituality,* Boston: Shambala, 2000; *Boomeritis,* Boston: Shambala, 2002; I am grateful to futurist Professor Richard Slaughter for drawing my attention to Wilber's work. See also the "Spiral Dynamics" of Don Beck, for example at http://www.integralworld.net/beck2.html.

[4] http://crnano.org/systems.htm.

organization: *Guardian*, oriented principally around provision of security; *Commercial*, promoting science and trade; and *Informational,* devoted to abundance. It is easy to see that these Dominants (to borrow a term from the communications theory of Roman Jakobson) can be mapped against the most significant dynamics of certain periods, cultures, and elements of cultures. In Wilber's terms, Guardian would be blue, and in the USA reflect Republican conservative family values; Commercial orange, representing scientific Enlightenment values; while Informational might perhaps be green, representing postmodern inclusive global or "holistic" values, enthusiasm for open source versus proprietary development of novelty, etc. The interactions between individuals and groups dominated by one mode or another can be troublesome and, indeed, mutually incomprehensible. Green, Wilber warns, tends to "dissolve blue", which can wreak catastrophic damage on prickly red (tribal/gang) cultures or subcultures struggling to shift "upward" toward Enlightenment/ Commercial orange, by invalidating support for the intermediate "conservative" or blue Guardian stage in the interests of a premature holism.

My own analysis poses six sequential phases each half a century long and comprising two generations, punctuated by wars. The 300 years can be graphed as a sine curve—an upward semicircle followed by a downward semicircle, each half comprising 150 years. (The full iterated sequence of roughly 50 year phases runs Algorithmic-We-I-It-Theory/Text-Code-Algorithmic....) I propose no numerology here, attempting rather to draw together a number of separate analyses that seem to find certain recurrences at certain intervals, not all of them compressible into a single algorithm; one influence might enhance another, a third might tend to mute it. What's more, recent human intervention on a planetary scale might be expected to have modified, extended or suppressed such cycles anyway—although some of the theorists I quote below do carry their schemata forward into the second half of the twentieth century.

A similar model has been suggested in *Generations: the History of America's Future, 1584 to 2069* by William Strauss and Neil Howe (New York: Morrow, 1991), whose parsed narrative discerns, like Modelski's (below), a basic cycle four generations long, marked by disruptive "secular" and "spiritual events". Cohorts—individuals born within a given time-frame—are said to resemble each other in temperament and trajectory more than they do those from earlier or later generations. The four phases, in order, are the Idealists (inner-driven, arrogant, creative), indulged in childhood after a secular event; the Reactives (disruptive in youth, pragmatic in maturity, uncultivated); the Civics (establishment figures); and the Adaptives (guilty conformists, aging into sensitive carers).[5]

[5] What drives this recurrence, in Strauss and Howe's view, is a cycle of nurturant practice. Underprotection in childhood creates a tendency in the adults so formed to pay more attention to their own children, so the next generation shows increasing nurturance. The third step is a generation smothered by overprotection, and the reaction to such stifling is a fourth phase of decreasing nurturance, which in turn leads back to the start of the cycle.

It is interesting that the linear progression suggested by Strauss and Howe resembles a compressed version of my own model and Wilber's, with their four-step periodicity folded into every pair of consecutive Dominant regimes in mine. Inner-driven Idealists correspond in character with my "I" generations, Reactives with "IT" empiricism, Civics with "THEORY/TEXT" governance, and Adaptives with "PHATIC/ALGORITHMIC" conformity. Two stages are elided: "CODE", following "THEORY", and "WE", following "PHATIC", but the two models operate at different scales. Neither

The three phases or tonalities characterized by Treder and Phoenix match fairly well with the 150 year half cycle I discern between, say, 1850 and 2000, in which the doubled generations are characterized sequentially by the dominants I have dubbed IT (imperialism, Hot Peace, public art), THEORY (global war, religiosity, modernism) and CODE (Cold Peace, democracy, postmodernism). In tone, that half cycle begins with what Australian historian and entrepreneur J. Penman calls High Vigor and moderate Stress, through Mid Vigor and High Stress, to Low Vigor but only Medium Stress today.[6] These parameters are related to, and perhaps driven by, variations in child-rearing practices and those in turn, historically, depend on availability of adequate or abundant nutrients, levels of perceived threat and security, etc—see note 6.

Very roughly, we might expect Guardian/IT cultural phases to attempt to impose strong centralized and hierarchical command over the ownership of nanofactories and any distribution of their socially disruptive cheap goods. Commercial/THEORY phases might use state power as well as conglomerate capital power to restrict or co-opt MNT. Informational/CODE phases will be likely to embrace MNT and attempt to spread its benefits widely, perhaps to the whole world, and to resist conservative "moral values" restraints, corporate ownership, and copyrights. It is obvious, despite the natural affiliation of computer-savvy members of the CODE or green generations, that very powerful forces will be strongly motivated to restrict MNT for reasons of private gain and public security, even in those societies falling increasingly under this dominant in the last 50 years

The problem foreshadowed by Knight's novel is that resistance to the free development and distribution of MNT might elicit regression to earlier dominants. In Wilber's terms these are beige (instinctual/subservience to parents), purple (magical thinking) and red (egocentric), which map moderately well with the earlier (and subsequent) 150 year semi-cycle I have proposed, summarized briefly as ALGORITHMIC (global conflict, classicism, aristocracy), WE (feudal disorder, formal religion at nadir, superstition at zenith), and finally I (romanticism, beginning with successful revolutions and perhaps global war and culminating in thwarted revolutions). Historically, in the West, these three dominants held sway between 1700 and 1850, continuing on into the three phases previously described. On this model, which is consistent with classic long cycle analyses by G. Modelski[7] and others, we are arguably heading

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is there a gross discord between the order of the two sequences. No doubt this is connected with the individual life-stage structure that also underlies each model: Youth (which conflates "WE" and "I" stages), Rising Adults ("IT"), Midlife Adults ("THEORY/TEXT" plus the shift to "CODE"), Elders (the transition from "CODE" to "PHATIC" or "RULE").

[6] Jim Penman, *The Hungry Ape*, Melbourne, 1992, cited by Broderick, 1997.

To sketch briefly the broad basis of Penman's mechanism, operating on cultures via typical patterns for discipline of their infants: Societies using early control tend to develop a politics based on group loyalty; in a time-frame of low Restraint they produce feudalism, and during high Restraint, they produce stable city states and nation states. Their populations are open to change, and have elaborate economic skills. By contrast, societies lacking early control favor a politics based on personal, face-to-face authority; low Restraint stretches of the cycle are marked by unstable control over regions with shifting borders, while during high Restraint regimes they build large imperial dominions. Their populations are tradition-bound, and less skilled (Penman, p. 184).

[7] George Modelski, *Long Cycles in World Politics*, Seattle: University of Washington Press, 1987.

If Modelski is correct, since 1494 the world system, parameterized in versions of the four Parsonian variables (economy, polity, societal community, and pattern maintenance or media/information

right now into a new algorithmic or phatic phase, with its attendant risks of banality, degeneration towards superstition, significant conflict (and perhaps the unexpected "War on Terror"—and *by* culturally motivated terrorists and hegemonists—is an index of this). Of course, such 300-year cycles—which I trace back through at least three iterations, and probably much farther—would presumably be interrupted forever by a Singularity, especially one in which drastic life extension becomes possible, thereby upsetting the already muddled traditional replacement of generations raised under consecutively different conditions. Nanotechnology is clearly one of the driving forces thrusting advanced technological cultures toward just such a Singularity. One question, therefore, is whether Wilber's orange and green phases or waves can be sustained in their dominant roles at a time when external and internal factors are arguably impelling Western cultures, as well as their foes, toward what one might regard as more primitive dominants.

Indeed, this kind of analysis might lend itself usefully to the study of contemporary cultures other than the Western. Should they all be regarded, however different they remain, as *in some sense* synchronized with the productive and informational drivers of the global economy? One suggestion I hesitantly made in my preliminary study is that societies throughout the world have been *traditionally* tied, far more than we might imagine, to a kind of global clock driven by variable insolation, and the impact of available solar energy upon climate and hence food supply. Again, even if this has been the case, it might no longer be so in an epoch where human-induced global warming is skewing traditional large-scale solar-modulated weather patterns, and in which global scientific production and transport of food and raw materials to a large extent obviates reliance upon local climatic conditions.[8]

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apparatuses), has passed through five "long cycles", each with four generational phases. The cycles run to a little more than a century each, and climax in devastating contests for world leadership. These global conflicts last between 23 and 31 years, with the same average as his cycle generation, 27 years. The turn of the millennium marked the exhausted stage of an American century, and, if no better and more humane means is devised for adjudicating leadership, the world probably would be doomed to a new global war in perhaps 2030 (but not until then).

[8] A somewhat different but arguably overlapping analysis was developed by Raymond H. Wheeler, a former professor of psychology at the University of Kansas and president of the Kansas Academy of Sciences, who constructed his own grand theory of cultural recurrence. Around the middle of the 20th century, Wheeler orchestrated a massive research project, drawing on up to two hundred co-workers, to reduce all of recorded history to coherent summary form. As the data from 2500 years of records were tabulated, he discerned a number of recurrent patterns world-wide. The most notable was a roughly 100-year climatic cycle, varying between 70 and 120 years, which seemed to fall into four predictable phases. From this periodicity, and drawing on then-prevalent doctrines of cultural and ethnic character, he theorized a regular swing of mass psychological emphasis between "classical" or "centralist" and "romantic" or "individualist" styles of community and culture, summarized in Ellsworth Huntington, *Mainsprings of Civilization*, [1945] 1959, New York: Mentor, 515–7. (Huntington was an explorer and Yale professor of geography and climatology whose books ranged from *Civilization and Climate* (1915) to his magnum opus, *Mainsprings of Civilization*, published two years before his death. His thesis of strong climatic determinism strikes us today as crankily ethnocentric at best, for he sought to discover why "vigorous" peoples like wealthy Euro-Americans were so much more successful than the "indolent", "feminized" races nearer the equator or otherwise trapped and stultified by debilitating circumstances. In the era of the Asian Tigers on the Pacific Rim, not to mention the historic defeat of American military efforts by tropical Vietnamese and the current imbroglio in Iraq, this claim seems not just racist but ludicrous. We should not be entirely distracted,

In any event, it seems arguable that an analysis of cultural dominants of this kind, and their differential impact, might provide some general guidance in our expectations of the near-future impact of any truly radical and disruptive technology such as MNT.

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however, by our legitimate distaste for colonial premises and rhetoric. Huntington's comparative ethnography remains a rich trove of data, usefully categorized, on historical and environmental flows in the fortunes of nations.)

Obviously these climate-driven distinctions cannot be found literally everywhere simultaneously, because a global shift like the El Niño vacillation will bring unusually abundant rain to one region while filching it from another. Still, events like the Maunder Minimum suggest that at least some secular climatic variations on the order of a century can be due to changes in the sun's internal clock. It is feasible that more subtle variations depend on more regular solar pacemakers, such as the deep processes that also cause the sunspot cycle and perhaps (even in the absence of human intervention) modulate global warming and cooling.

Wheeler and his team found their data was usefully schematized by a four-fold sequence: Warm-Wet, Warm-Dry, Cold-Wet, and Cold-Dry. Each contributed to a certain characteristic mode of collective behavior, so that "similar events have occurred throughout history during the same phases of the 100-year climate cycle" (Dewey and Mandino, *Cycles,* 1971, New York: Manor Books, 138). Adapting this model in brutally schematic form, and projecting 20 years (without taking account of drastic global climate change), we might map the 20th century thus (138–9):

WARM/WET: 1900-24	WARM/DRY 1925-49	COLD/WET 1950-74	COLD/DRY 1975-1999	WARM/WET: 2000-24
early stability; nationalism; imperialist and expansionary wars; good crops; genius flourishes; prosperity	police states; introversion; surrealism; economic collapse; cruel mass war; crops recover; revival begins	individualism; decentralized polities; emancipation; mechanical scholarship; shift to anarchistic tone	weakened government; migrations; race riots; class struggle; revolution; new leadership emerges	early stability; nationalism; imperialist and expansionary wars; good crops; genius flourishes; prosperity

Since Wheeler announced his model just prior to the mid-century, this makes a prescient cultural display, although he missed Greenhouse heating.