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"FLUX & PRAGMATICS"

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One fall morning, it struck me just how ordinary the extraordinary had become. Over the course of two or three hours, I responded to a few emails, bought a book and two songs, read the paper, called a friend in Amsterdam, updated my Website, and wrote part of what you are reading -- all on the same machine, all at the same time. I am the lucky inheritor of a dream come true. The second half of the 20th century saw a collection of geniuses, warriors, pacifists, cranks, visionaries, entrepreneurs, great successes and miserable failures labor to manufacture a dream machine that could function as a typewriter and a press, a studio and a theater, a paint box and a gallery, a piano and a radio, the mail and the mailman. Not only did they develop just such a machine, but by the turn of the millenium, they managed to embed it in a world-wide system accessed by millions of people a day. The computer can truly be called the 21st century culture machine.

While other technological dreams that sprouted up at the same time – that *Popular Mechanics* future of flying cars, robot butlers, and thousand story skyscrapers – never made it, this vision of a machine that can simulate any other is now a widely shared reality. Teenagers watch videos on their cel phones, old ladies taking power walks in the mall text message their friends about upcoming sales, ubiquitous grids create wireless hotspots in the middle of Medieval town centers.

SIMULATION, PRATICIPATION

Digital information technologies, on the other hand, benefited from the decades-long process of miniaturization, and I refer to as aetherization. [...] The transformation of the physical substrate of culture – bound books, paper photographs, vinyl records, and celluloid film – into intangible bits and bytes of information has created an info-aether, increasingly accessible everywhere and at any time. As we will see, the key to this process is simulation matched with participation. When we speak of simulation, we are in the technological realm of how hardware and software generate media, when we discuss participation, we shift into the social sphere of users – whether we call them readers or writers, players or listeners, gamers or bloggers. Our task will be to determine how and why this combination leads to the culture machine.

To talk about the computer as culture machine means that there are many things that the computer can and does do that will be outside the scope of our discussions: cybernetics, database construction, automation, network management, supercomputing, the list goes on. The interplay between simulation and participation is at the core of the machine's functionality. Simulation is what the computer does as it first imitates, then enfolds, and finally transforms other systems of cultural production. Put more simply, simulation is what lets one machine take the place of the stereo, VCR, and videogame arcade (not to mention calculator, typewriter, and even newspaper). Participation brings people into contact with the simulations, expanding the user base and turning the computer into a major social and cultural force.

In computer science, unlike the arts and humanities, there have never been pejorative connotations attached to the verb "simulate" or to the noun "simulation." In computer science, it simply means the capacity to reproduce the actions, functions, and often the "look and feel" of other computers, software, systems, and devices.

Simulation as an objective becomes a way of convincing a large number of people that a project is feasible and offers a concrete goal – the simulation of another machine's, system's, or software's functionality. The goal and the result, of course, do not have to be and in fact rarely are the same. Generally one of two

things happens: The simulation falls short of the model, or, with successful systems, the simulation is modified or exceeded. As the visionary computer scientist, Alan Kay used to say, asking people what they want is one of the least productive ways of inventing the future: " if you ask most people what they want, they want just what they have now, 10 percent faster, 10 percent cheaper, with 10 percent more features."[1] The cyberpunk maxim that "the street finds its own uses for technology," often enters at this point. In other words, the intention of the makers is often contradicted by the choices of the users, and as more users enter a network, Metcalfe's Law indicates that they will be affecting it geometrically.

Participation is the next step after establishing communication between the machines. This is a two step process. The machine allows the user to make something and upload it to the network, which has a different set of users at the other end who download it. What are the affordances the system offers to the user to move beyond passive reception towards participation? These can be everything from the development of better ways to interact with software and hardware (the graphical user interface comes to mind), to transformations in the conceptualization of how the hardware, systems, or softwares will be used in the world. These can be ideologically driven, market driven or research driven. Usually, increases in participation are driven by combinations of two or three of these agendas, rather than having one single, driving force behind them. Participation is what gets the power of computing and networks out of war rooms and into living rooms. Bob Metcalfe, a pioneer in wiring people together, put forth one of the most succinct analyses of networks ever offered. Metcalfe's Law states that the value of a network is proportional to the square of the number of users of the system.[2] That is to say, networks become more powerful and valuable as more users join them. One fax machine is useless, two fax machines create a secured connection, the more fax machines that are introduced into the network, the greater the value to each individual sender and receiver, a geometrical rather than arithmetic increase with each new user. For all there is to celebrate, though, there is also cause for caution; this is because we

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[1] Alan Kay, "Inventing the Future," *Stanford Engineering*, Volume 1, Number 1, Autumn 1989, pg 1-6 accessed via http://www.ecotopia.com/webpress/futures.htm

[2] Bob Metcalfe invented ethernets, and was a founder of the enormous Internet infrastructure company 3Com.

are in the midst of a secret war being waged between downloading and uploading.

DOWLOADING, UPLOADING

If we are indeed surrounded by a conflict that most of us do not see, we need to stop for definitions in order to understand the combatants. Generically, downloading refers to receiving a file, and uploading refers to sending it.[3] In networks, when a person pulls in data or media, this process is called downloading. When a person or a machine sends out data or information, that is uploading. Downloading implies moving data from a main, or central source to a peripheral device. Uploading, by contrast, carries associations of moving data not only from a periphery to a centrality, but also from one device to many, flattening out the hierarchy of production, distribution and reception.

All animals download, but only a few upload anything besides shit and their own bodies. Beavers build dams, birds make nests, and termites create mounds, but for the most part, the animal kingdom moves through the world downloading, and then munching it bits at a time. Humans are unique in their capacity not only to make tools, but to then turn around and use them to create superfluous material goods – painting and sculpture – and superfluous experiences – music, stories, religion, philosophy. Of course, it is precisely the superfluous that then comes to define human culture and ultimately humanity itself. Understanding and consuming culture requires great skills – ask anyone who has taught a child to read – but failing to move beyond downloading is to strip oneself of a defining constituent of humanity.

For all the wonders of the present moment, a hierarchy of cultural production persists, even on-line. 1% of the members of a web community upload material, but no more than 10% of the users comment on or modify that content, and upwards of 90% of the community remains content to download without uploading.[4] One reason for the persistence of this pyramid of production is that like countries or peoples, different media have their own, unique cultures. I

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[3] One cause of confusing is that given the importance of packet sharing to transfers of any kind over the Internet, a single file will be broken down, and uploaded and downloaded many times by many servers in the course of its "travels," regardless of where it originates and where it is going.

[4] Charles Arthur, "What is the 1% rule?," *Guardian Unlimited* Thursday July 20, 2006 http://technology.guardian.co.uk/weekly/story/0,,1823959,00.html

would maintain that for the past half century, our culture has been defined by the television, and television culture is defined by downloading. Television as a media system is defined by taking in images and sounds produced by others.[5] Whether by broadcast, by cable, by satellite; live, delayed, taped or time-shifted, it is all downloading. The challenge that the computer mounted to television over the past decade is not just an issue of one machine being upgraded by another – like record players being replaced by compact discs, or VHS recorders by DVDs. Instead, the computer is a machine which can upload anything its users make and distribute them either one to one, or one to many. This is a radical break from the culture of television. But the computer's capacity to simulate any other media device perversely imperils its potential, because the computer is also a machine that can be better at downloading than television ever was. It is this dualism that defines our moment and sets the stage for the secret war between downloading and uploading.

CULTURAL DIABETES

This is more than an argument over technical capacities or even modes of use. An overabundance of downloading, to the exclusion of uploading leads to a what I characterize as cultural diabetes. For diabetes sufferers, the body cannot create enough insulin to process the sugar that it has taken in: there is an imbalance between consumption and production -- uploading and downloading. Diabetes is to a large extent a disease of plentitude, the result of obesity and the over-consumption of calories.[6] Cultural diabetes works in similar ways. To restate: it is not that downloading is bad and uploading is good, just that the two must be balanced such that one is mindful in consumption and meaningful in production.[7]

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[5] Home video production is the exception to this rule, but the percentage of people who ever used their televisions as the playback mechanism, much less as part of an editing suite, for self-generating media production was a miniscule part of the overall penetration of television into the home.

[6] In the West, it tends to be a disease of the poor, as the rich have adopted lower calorie diets for reasons of aesthetics as much as health. In the developing world, diabetes is becoming a disease of the rich, who can afford to consume more food.

[7] Ellen J. Langer defines mindfully as follows: (a) openness to novelty; (b) alertness to distinction; (c) sensitivity to different contexts; (d) implicit, if not explicit, awareness of multiple perspectives; and (e) orientation in the present. Adapted from Ellen J. Langer, *The Power of Mindful Learning* (Reading, MA: Addison-Wesley, 1997). See also, Ellen J. Langer and Mihnea Moldoveanu, "The Construct of Mindfulness," *Journal of Social Issues* (56:1), 2000, pp. 1-9., p. 6. Archived at http://cms.dartmouth.edu/conferences/langer1.pdf langer@wjh.harvard.edu.

This requires disrupting the flow of media that surrounds us.[8] As the media mutated, so did the way its contents flowed to, through, and around us. The digital video recorder (or DVR as it is also known) enabled people to time shift their programming far more easily than the video cassette recorder (the VCR). But as DVR users time shifted their way through commercials, businesses began to embed advertisements within the content. As consumers turned to video games or on-line entertainment, e-billboards were sold in sports games and pop-up ads moved into browsers. As the cell phone made people more mobile, and ubiquitous computing filled the world with information spaces, commercial speech in the form of advertisements, signage and subtle cues to consume are ever more stealthily embedded around us in the invisible infosphere through which we move. In other words, when broadcast channels lost their centrality, televisual culture seeped outside the box and infiltrated other environments.

Short of complete renunciation of mediated communication, it is impossible not to "go with the flow," at least some of the time, losing ourselves in it as if we were leaves in a stream. But there are ways to step outside the plentitude, at least occasionally, carve out periods of mindful engagement. This is vital because while the flow may be limitless, our time and attention is not. Until and unless the prophets of posthumanism can make good on their promises of eternal life, we will be bound by our limits, and by our aspirations, as well. This is to stress the importance of uploading as habit rather than as mere technological affordance.

WEB 2.0

A few years after the first dot.com bust, the Web began to develop into an even more participatory medium. This happened at the same time that the technology sector started to regain its footing, and prompted the high technology sector to talk about "Web 2.0." I see this as premature, akin to labeling 1920s Dada as postmodern, but it is good to see the increasing overall confidence that the new

[8] Flow, as defined three decades ago by the critic Raymond Williams, was ways in which broadcast television would arrange a night of viewing to keep the viewer glued to a channel, unwilling to change to another. Williams's point was that contrary to what viewers thought, they were not spectators watching shows, but were instead eyeballs being sold to advertisers. Raymond Williams, *Television: Technology and Cultural Form* (New York: Schocken Books, 1975).

thing is new again. Systems theorists would characterize the emergent Web as displaying a more robust architecture of participation.

The Web is evolving more fully into a truly social software, offering a myriad of new ways to link people together, moving from a medium in which the user's characteristic activity is surfing from one static web page to another into a more dynamic experience in which the users themselves contribute to the environment. The growth of blogs and wikis are evidence of this shift. The explosion of sites like flikr, for tagging and sharing photos, and del.icio.us, for social bookmarking, allow users to categorize, collect and share their archiving strategies for this dynamic media, and has even led to a new term for all of this amateur tagging: "folksonomies."[9] The opposition here is between librarians, archivists, and information specialists, who professionalize and systematize this kind of activity into "taxonomies," and the evolving personal and social group-driven folksonomies. What is less discussed are the transformations that we should call for in both use and attitude towards whatever iteration of the culture machine this is.

The relentless push to market technological innovation helps drive these new habits of mind, but also places attractive impediments in their way. Two of the present grails are ubiquity – the embedding of computational power in every environment – and mobility – the ability to communicate with the network from anywhere. Together, fully mobile, ubiquitous computing could make downloading that much easier, but the movement to handheld and telephone devices could make uploading that much harder. The reason for this is that we tend to sacrifice input capacity for size, mobility and ubiquity. As keyboards, screens, and even lenses get smaller and smaller, discourse tends to revert to text messaging level – "CUL8R" for "see you later" – and the device is turned into a permanent distraction and a shopping affordance – the wand that allows us to buy things with a swipe. If the recent era of the Web, linked to desktops and fully featured laptops, turns out to be an anomaly on the way to an ever more one-

[9] See http://flickr.com and http://www.del.icio.us. The term was coined by Thomas Vander Wal. See Daniel H. Pink, "Folksonomy," New York Times Sunday Magazine, December 11, 2005, archived at http://www.nytimes.com/2005/12/11/magazine/11ideas1-21.html?ex=1291957200&en=50937f27a0973e6e&ei=5090&partner=rssuserland&emc=rss.

sided consumer mobility with voice telecommunication added, we will have made a major mistake. We should not sacrifice the capacity to upload for the possibility to download.[10]

MELIORISM

So how can we wade into this secret war on the right side? Ensuring the capacity to upload, and doing so in a meaningful way, is less a revolutionary strategy, than one pointing back a century, invoking the pragmatic philosophers, and even more centrally, their concept of meliorism. 20th century pragmatist William James defined meliorism as "an attitude in human affairs" rather than a creed: "Meliorism treats salvation as neither inevitable nor impossible. It treats it as a possibility, which becomes more and more of a probability the more numerous the actual conditions of salvation become."[11] Meliorism's movement towards the possibility of improvements melds well with the cultures of computer. Television does improve so much as metastasize, spreading out from the den, to multiple incarnations in every member of the family's bedrooms, into our cars, onto our PDAs, and into ultra-bright "outdoor models," recently reserved for the ultra-rich but soon to be in every backyard space near you. The computer's trajectory, on the other hand, strikes me as hopeful and ever upward, from 1.0 to 2.0 to 2.5 to 3.1. to 7.8 to an asymptote of infinity. Of course, some of this is just the hype of new releases and unnecessary upgrades, but even short-term history tends to smooth these jagged edges off the upward tending curve. The quantitative increases in speed, sophistication, ubiquity, mobility, miniaturization and personalization, become, or at least have the capacity to become, qualitative changes in the ways we make culture.

To come in on the side of uploading is a modest goal, not the perfection of utopianism, but the pragmatics of meliorism. As meliorism takes as its goal making things better through concerted effort, meliorism is a habit of mind and a mode of practice that aims for realistic optimism rather than passivity,

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[10] This aphorism was one of my contributions to Mieke Gerritzen and Geert Lovink, *Mobile Minded* (Amsterdam: bis, 2002).
[11] William James, *Pragmatism* (Cambridge, MA: Harvard University Press, 1975 [1907]), 137.

pessimism, or nihilism.[12] John Dewey wrote that "the striving to make stability of meaning prevail over the instability of events is the main task of intelligent human effort"[13] What could be more melioristic than mindful reception and meaningful production, even if these exact words have not been employed?

THE FUTURE IS NOW

We've been hearing about the computer "revolution" for a generation now, but the message should really be that much of the dialogue about "what's coming" is, in fact, "already here." The wonders of the digital are being used every day, but we have to move away from our sheer amazement about this to confront the realities of what it is we're actually making, sending around, and then reading, watching, listening, and playing. We need to become adept at shifting our attention from the figures of culture to its ground, actively shifting our focus from the individual products to the culture machine and then back again.

The hunger for meaningful media pops up in spots both expected and underexplored. For the past two decades, there was a certain flavor of discourse that surrounded you at any gathering of the techno-tribes. You would hear this at the high-tech trade shows, in European *Kunsthallen*, at underground clubs for hackers, in venture capital investment forums. It was the discourse of future possibilities. People would talk about the things they would make when computers got cheaper, when they had enough memory and processing speed available to them, when 3-D rendering became easier, when lots of people had access to higher bandwidth content, the list goes on. I began to understand that this was a discursive strategy to avoid talking about what work meant. It was a call to appreciate it for working at all. I heard this from students, from colleagues, from artists and designers, and always from journalists covering the field who seemed to be using this tactic to cover up for the fact that that which was being created rarely lived up to the popularizing hype. But two or three years ago, I realized that I was hearing much less of this wistful, evasive

[12] Though passivity, pessimism, and nihilism are hardly without their own partisans. See most recently, Joshua Foa Dienstag, *Pessimism: Philosophy, Ethic, Spirit* (Princeton: Princeton University Press, 2006).
[13] John Dewey, *Experience and Nature* (Chicago, IL: Open Court, 1929), p. 45.

futurism. I can't identify the tipping point, but I feel confident in saying that there is definitely a new framework.

We finally have machines and connections that render moot most if not all of the complaints I have heard about computers as creative cultural tools. While there will always be technical improvements, network efficiencies, and dropping prices, the basic tool set is now there: computers are powerful and small; memory is cheap and plentiful; peripherals like cameras, scanners, and printers are priced at consumer rather than professional rates; productive software is relatively stable and has a huge installed base; and the network has tens of million of nodes connected at high speeds. In other words, the future has arrived, no matter what its distribution patterns. It is the quantitative increase in the number of people on-line, and even more important those with access to high speed bandwidth, leading to a qualitative difference in the way that people use and interact with these media that has prompted the meliorative designation Web 2.0.

Many of the ideas here were generated in the course of teaching the next generation of artists, designers, architects, and writers. I wanted to encapsulate their hopefulness and to reassure them that the world has great things in store. I also wanted to counter the cycle of hype and paranoia that news people tend to generate around computers. They tend to over-promise, on the upside to utopia, and then tear things apart on the way down towards apocalypse. That is why we hear so much about the "future" promise of computers, on the on hand, and their dangers on the other. These are the intermingled fear of the omnipotence, like the murderous artificial intelligence named HAL from Stanley Kubrick's film *2001*, and the utter helplessness of technological overdependence that manifested themselves in the panic about the Y2K virus at the turn of the millennium. By acknowledging the secret war, we can simultaneously celebrate the wonder of this moment while raising a warning that we are just as capable of squandering this unexpected inheritance as we are of proving ourselves worthy.

I use the word wonder fully aware that familiarity breeds, if not contempt, at least indifference. Think of those fleeting moments when you look out a plane's window and realize, that regardless of the banalities of air travel, you are flying, higher than a bird, moving through the air itself at hundreds of miles an hour, an Icarus safe from the sun. As computers get smaller, more ubiquitous, embedded

in ever-more quotidian objects, faster, better connected, and easier to use, let us reserve at least a moment or two to wonder at the marvel.
To spare us from the shame of wasted opportunities, I pose the question: What is the point of it all? What is the point of inheriting a dream machine if we do not use it to do extraordinary things? Shouldn't the point of it all be to create a digitized culture that we can defend as being worthy of respect by nature of its meaning and content as well as its technological prowess?

Mindlessness tends to dominate downloading, leading to malaise masquerading as activity. It is here that the idea of mindfully downloading comes in to save us from that sense of attenuated distraction that characterizes too much of our essentially passive interaction with downloading. Our daily lives and routines have too much going on within them to concentrate fully on everything. That is why we have automatic responses and habits of attitude. But there are times when focus is called for, and should be summoned, it is at that moment that we can be called mindful. Mindfulness is not so much an innate trait as a learned response to the world. Rigor is a part of mindfulness, a muscle to be exercised and I refuse to capitulate to the notion that downloading sports scores, box office tallies, and news of celebrity divorce constitutes an infotopia.

To claim that downloading is inherently harmful and uploading innately positive would be nonsense. The two syndromes are complementary, but to function in an evolved mode, they should be balanced. The watchwords are to be mindful in the consumption of culture, or downloading, and meaningful in the production of it, or uploading. As I stated above, it is not that downloading is bad and uploading is good, just that there are modes by which you enter these two syndromes to maximize your human potential. Downloading, of course, becomes ever easier and cheaper, with new reams of information and entertainment being offered regularly. If the Walkman changed our relationship to personalized technology, and made each of us the director (though not composer) of the soundtracks of our lives, the portable MP3 player changed our relationship to the archive of music in our heads, turning us all into DJs with crates of records in a truck. The WiFi, Web enabled, GPS equipped PDA does something similar with information, communication and space. These are the additive layers of the WEB 2.0 era in which users are co-developers, adding to a collective growth. The

system is designed for modification, unfinished, perpetual beta, and remixability.[14]

One of the tragic farces of the reception of Freud's ideas in the middle of the 20th century, especially in the United States, was the misunderstanding of his project. Freud stated that his methods were designed to move people from neuroses into "ordinary unhappiness." But too many of his acolytes wanted to move to the alchemical fiction of transforming psychological pathologies into a state of permanent bliss. Mindful downloading will not create a state of permanent bliss. But then again, nothing will.

Edited by Paul Mathias

[14] Tim O'Reilly "What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software" 09/30/2005 — see: http://www.oreillynet.com/lpt/a/6228