

Virtual Realism, Chapter 2

His words hovered in my mind for months, then boomeranged with painful irony. What he said over lunch held the future in a horrible way that neither of us could grasp at the time. His words foreshadowed a tragedy that would injure him and implicate our schizophrenic culture. At the time, the prophetic words were innocent of the shadowy terrorist the FBI calls “the Unabomber.”

Lunch was at a Sheraton Hotel on the second day of a national conference on virtual reality held in Washington, D.C., December 1-2, 1992. I had organized the conference for the Education Foundation of the Data Processing Management Association, and Professor David Gelernter was the keynote speaker. I had been looking forward to talking with him, and lunch seemed a perfect opportunity. The Yale computer scientist had invented the Linda programming language and had also written eloquently about the human side of computing. I knew him not only as a writer but also as a friendly reader of my books. I looked forward to an exchange of ideas.

Our conversation moved from pleasantries to questions about how to humanize the computer. Several of David Gelernter’s sentences imprinted themselves on my memory and later played back to me in ways I could not — would not — have imagined: “We are on a social collision course,” he warned. “One portion of our population is building computer systems — the software

cathedrals of this era — while another portion grows increasingly alienated from computers. This situation holds the greatest danger of a cultural collision.” Here was a premonition about the cyberspace backlash.

Seven months later, on June 24, 1993, David Gelernter opened a mail package on the fifth floor of the Watson computer science building at Yale, and the package blew up in his face. The office was in flames, and David barely escaped. He staggered to the campus clinic, arriving just in time to save his life. The permanent injuries he suffered from the mail bomb included a partially blinded right eye, damage in one ear, and a maimed right hand.

Two years later, on April 24, 1995, a letter to Gelernter from the Unabomber taunted: “If you’d had any brains you would have realized that there are a lot of people out there who resent bitterly the way techno-nerds like you are changing the world and you wouldn’t have been dumb enough to open an unexpected package from an unknown source.” Here was the low-blow attack on techno-nerds, the in-your-face and personal malevolence that announced a culture collision. The social train wreck was no longer around a distant corner of the future.

On September 19^t, 1995, the Washington Post caved in to the Unabomber’s threats by publishing his 56-page, 35,000-word manifesto “Industrial Society and Its Future.” The newspaper sold out early the same day. By evening, I could not find a single copy of the Washington Post with the 8-page manifesto insert. The next morning, I went online to the Internet and downloaded the entire 200-kilobyte text of the manifesto from the World Wide

Web site which the FBI had put out concerning Unabomber. On the Internet, no one can kill you with a mail bomb — at least, not yet. Desperate to be published, the Unabomber now had his own “home page,” complete with wanted sketches and maps pinpointing the series of explosions, all in high-tech format, thanks to the FBI. I did a text search of the manifesto and found the word “computer” frequently used in conjunction with “control” and “technology.” The serial bomber blamed technology, especially computers, for several things, including: the invasion of privacy, genetic engineering, and “environmental degradation through excessive economic growth.”

The Unabomber Manifesto borrows from the school of social critics who follow Jacques Ellul. Ellul’s Technological Society, a bible in the 1960s, demonized an all-pervasive technology monster lurking beneath the “technological-industrial system.” The Unabomber Manifesto draws heavily on this line of thinking but goes further by linking technology with computers. The killer critic sees computers as instruments of control to oppress human beings either by putting them out of work or by altering how they work. The Manifesto states:

It is certain that technology is creating for human beings a new physical and social environment radically different from the spectrum of environments to which natural selection has adapted the human race physically and psychologically. If man does not adjust to this new environment by being

artificially re-engineered, then he will be adapted to it through a long and painful process of natural selection. The former is far more likely than the latter.

The dilemma posed by the Unabomber Manifesto appears in the work of other alarmist critics. Many people in fact share the Unabomber's view without harboring the same pathological desperation. The no-win dilemma they see is either to permit evolution to wreck millions of lives or to use technology to forcibly re-engineer the population. Either artificial engineering or laissez-faire evolution seem the sole options: Either manipulate humans to fit technology, or watch technology bulldoze the population until only the techno-humanoids are left standing. The Ellul school of criticism posits a monolithic steamroller "technology" that flattens every human activity. Recent members of this school, like Jean Baudrillard, nationalize that alien Leviathan and call it "Americanization." They fear the ghostly "representations of representations" that inject Disney-like simulacra into every facet of cultural life, emptying active content by exploiting images.

We do not need look outside the United States to find Luddite theory. Since the publication of the Unabomber Manifesto, many American policy writers have felt the need to distance themselves from the Unabomber because they in fact oppose the same technology monster attacked by the Manifesto and they share some critical sources, like Ellul. While agreeing with the Unabomber's ideas, they understandably want to distance themselves from terrorist practice. The number of such critics grew in the early 1990s when information technology

extended into all areas of life, spawning the multimedia industry and virtual reality companies. Computer networks like the Internet came into general use in the early 1990s, and economic forecasts indicated that the computerized infrastructure was transforming the national economy as well as the American culture. Not surprisingly, critics took note.

The Cyberspace Backlash

Not long after the arrival of cyberspace came the cyberspace backlash. A cultural pendulum swings back and forth to feed sensation-hungry media. The media feeds on the overstatements thrown out by wide mood swings. A trend climbs in six months from obscurity to one of the Five Big Things of the month. The media's editorial strategy guarantees backlash: simplify an issue; then exaggerate what was simplified. Cyberspace was no exception, and the swing against cyberspace was inevitable.

The backlash runs from those who are frustrated by the frequent need to upgrade software to those who experience Alvin and Heidi Toffler's "future shock" as a personal, existential jolt. While the Tofflers preach "global trends" from an economist's overview, the individual suffers painful personal changes in the work and marketplaces. Waves of future shock may be intriguing to futurist policy makers, but those same waves look scary in the eyes of someone scanning the horizon from a plastic board adrift in the Ocean. The big picture of evolutionary trends often overwhelms and silences the personal pain of living

people. These people will eventually find their voices in a backlash against the confident soothsayers in business suits.

A streak of the Unabomber's Luddite passion weaves through the cyberspace backlash. The titles of several books published between 1993 to 1995 give a glimpse of the breadth of the backlash. Among the books you find: Resisting the Virtual Life by James Brook and Iain Boal, Rebels Against the Future: The Luddites and Their War on the Industrial Revolution by Kirkpatrick Sale, Media Virus by Douglas Rushkoff, Data Trash by Arthur Kroker and Michael Weinstein, Silicon Snake Oil: Second Thoughts on the Information Highway by Clifford Stoll, The Age of Missing Information by Bill McKibben, The Gutenberg Elegies by Sven Birkerts, War of the Worlds: Cyberspace and the High-Tech Assault on Reality by Mark Slouka, and The Future Does Not Compute by Steve Talbot. Obviously, these books show infinitely more grace than the Unabomber's crude, coercive manifestos, but they all reject, to varying degrees, the movement of life into electronic environments.

These critics tend toward what I call "naive realism." Many of them take reality to be immediate experience, and they see computer systems as alien intruders on the terrain of unmediated experience. The elaborate data systems we are developing still exist outside our primary sensory world. The systems do not belong to reality but constitute instead, in the eyes of the naive realist, a suppression of reality. The suppression comes through "the media" businesses that collect, edit, and broadcast packaged experience. The media infiltrate and distort non-mediated experience until immediate experience is compromised.

Computers accelerate the process of data gathering, and further threaten, in their eyes, the purity of immediate experience. Computer networks add unnecessary frills to the real world while draining life blood from the real world. Reality, they assert, is the physical world we perceive with our bodily senses, the world we see directly with our own eyes, smell with our noses, hear with our ears, taste with our tongues, and touch with our own hands. From the standpoint of this perceived world, the computer is at best a tool, at worst a distracting mirage. The mountains, rivers, and great earth beneath our feet existed before any computers, and the naive realist sees the computer as an alien entity in God's pristine world. The computer, say the naive realists, should remain a mere tool. It is a subordinate device that can distract us from the primary world. We can and should, if the computer enervates us, pull the plug or even destroy the computer.

The naive realist struggles with many fears. There is fear of abandoning local community values as we move into a cyberspace of global communities. There is fear of diminishing physical closeness and mutual interdependence as electronic networks mediate more and more activities. There is fear of crushing the spirit by replacing human movement with smart objects and robot machines. There is fear of losing the autonomy of our private bodies as we depend increasingly on chip-based implants. There is fear of compromising integrity of mind as we habitually plug into networks. There is fear that our own nature is slipping away as genetics transforms organic life into manageable strings of information. There is fear of the sweeping changes in the workplace and in

public life as we have know it. There is fear of the empty desolation of human absence that comes with increased telepresence. There is fear that it will be the same power elite who “moved atoms” as they pursued a science without conscience who will now “move bits.” By voicing such fears, the naive realist sounds an alarm that contrasts sharply with the idealistic good cheer of futurists like Alvin and Heidi Toffler.

Idealists vs. Naive Realists

Futurists like the Tofflers describe a culture shaken by future shock. But their shock comes in macro-economic waves, not in personal and existential distress. In this sense, futurists like the Tofflers are idealists. Idealists take the measure of individuals by placing them in the larger context of economics or politics to which the individuals belong. The Tofflers look to the economically and politically global, not to the individual or existential. Their big idea absorbs individuals. Like the other “digerati” celebrated by *Wired* magazine, the Tofflers welcome the digital revolution and you had better join or be crushed by the wheels of history.

Such idealism goes back to the early pioneers of computing. Rationalists like Leibniz and Descartes, the seventeenth-century philosophers, pushed computation and mathematical physics ahead of ethics and feelings. Their faith in progress relied on the reduction of thinking to systems of rational logic. So large was their optimism that they easily became targets for Voltaire who

caricatured Leibniz in the character Professor Pangloss in the novel *Candide*. Pangloss's tortured young student Candide meditates: "My Master said, 'There is a sweetness in every woe.' It must be so. It must be so." The idealist points to evolutionary gains for the species and glosses over the personal sufferings of individuals. Idealists are optimists, or, on bad days, they are happy worriers. The optimist says, "This is the best of all possible worlds, and even the pain is a necessary component." In the eyes of naive realists, the idealist is selling snake oil.

The cyberspace backlash strikes at futurist flimflam as much as it reacts to felt changes. Postmodern theory, with glib talk of "cyborgs," "software cities," and "virtual communities," provokes its opponents by flashing a brand of intellectually sophisticated terror. Postmodern rhetoric, lacking a compassionate basis in shared experience and common practices, was out to frighten the insecure and to train commandos who attack common sense. After all, language since Saussure is basically a code or system, not a living event for which we are each responsible. Since Saussure, the communicative power of language, its ability to build community, became an object of derision to sophisticated theoreticians. A certain jaded idealism enjoys poking common sense in the eye with hot purple hair, revolutionary verbiage, and cyberpunk affectations. A cyber-vocabulary promotes confusion as a fashion statement. Wave the banner of confusion, however, and you provoke a return to basics. Naiveté then seems a blessing. Yet the dialectical story does not end so simply, because the futurist

vision is not without cogency. What the futurist sees is precisely what brings others fright.

Nerds in the Noosphere

The futurist sees the planet converging. Computer networks foster virtual communities that cut across geographical and time zones. Virtual community seems a cure-all for isolated people who complain about their isolation. Locked in metal boxes on urban freeways, a population enjoys socializing with fellow humans through computer networks. Shopping, learning, and business are not far away once we enhance our telepresence abilities. The prospect seems so exciting that you see the phrase “virtual communities” mentioned in the same breath with McLuhan’s “global village” or Teilhard’s “Omega Point.”

Pierre Teilhard de Chardin, the French Jesuit paleontologist, envisioned the convergence of humans into a single massive “noosphere” or “mind sphere” (Ionian Greek “noos” = mind). This giant network would surround earth to control the planet’s resources and shepherd a world unified by Love. Teilhard’s catholic vision ranged from evolutionary physics to world religion (though his views received more suspicion than support from the Vatican orthodoxy). He saw in the physical world an inner drive for all substance to converge into increasingly complex units. Material atoms merge to create higher-level units. Matter eventually converges to form organisms. The convergence of organic life in turn produces higher level complexity. The complex units establish a new qualitative

dimension where consciousness emerges. On the conscious level, the mind — and the networking of minds — gives birth to a new stage of spirit. As in Hegel's nineteenth-century philosophy, Teilhard sees the birth of spirit as the inner meaning or cosmic purpose of the entire preceding evolution. Convergence toward greater complexity, even on the sub-atomic material level, exemplifies the principle of Love (agapic rather than erotic love). Only later, with the dawn of intelligence, does Love come into full consciousness and self-awareness. For Teilhard, this is the Christ principle that guides the universe: "In the beginning was the *Logos*." Only at its culminating point does history reveal its full meaning as the mental sphere becomes dominant. Teilhardians see ultimate convergence as the Omega or End-Point of time, the equivalent of the Final Coming of Christ.

Teilhard, like Karl Marx before him, absorbed much about evolutionary dynamics from the father of German Idealism, George-Friedrich Hegel (1770-1831). Hegel applied the Christian notion of Divine Providence to the recorded events of civilized history to show a rational progression. Hegel's elaborate encyclopedias and multi-volume histories of Western civilization affirmed a hidden evolutionary will driving purposely towards a single culmination. The fulfillment of history, according to Hegel, was a harmony of unity in diversity, a oneness which later interpreters described as a "classless society" (Karl Marx) or as "social Progress" (the St. Louis Hegelians). Hegel's genius was to see a divine Idea unfold in the material world of historical events — even to the point of squeezing all recorded history into a Procrustean logic of progress. The famous

“Dialectic” changed from its original meaning of logical conversation to its new meaning of social movements and improvements. The motor that powered the movement of history was a series of internal civil wars, each bringing the entire society a little closer to perfection. The culmination of all revolutions, for Hegel, produced Western constitutional democracies where the individual and the individual’s rights are recognized by the collective society. Just what this heavenly harmony looked like in practice appeared differently to the various brands of Hegel’s idealism. While Karl Marx’s brand came dressed in the worker’s garb of political economy, Teilhard’s brand blended synthetic physics with Christian communitarianism . It is especially the communitariansim that attracts network idealists.

Community seems a by-product of the development of machines. At first machines functioned as stand-alone tools under supervision by a single human operator. Then machines increasingly functioned in an ensemble. While the first machines were isolated work tools, they soon became parts of a larger assembly, with railroads, fuel distribution, and highway systems being the obvious examples. The spread of the machine as a assemblage reached into the sphere of human society with radio networks and television networks and now satellite networks. The linked machines plug into the networks with the computer as the controller switch. The result is a networked grid encompassing the earth and giving humans access to nature. Control over nature comes through a combination of human and machine networks guided by computers.

The network idealist builds collective bee-hives. The idealist sees the next century as an enormous communitarian buzz. The world-wide networks that cover the planet will form a global bee-hive where civilization shakes off individual controls and electronic life steps out on its own. In that networked world, information runs free through the planetary nervous system, and intellectual property vanishes as a concept. Individuals give and take freely. Compensation is automated for the heavenly, disembodied life. Electronic angels distribute credit. Private territory and material possessions no longer divide people. Digital mediation does away with the battle of the books, and proprietary ideas give way to free exchange and barter. Cooperative intelligence vanquishes private minds. Extropian idealists (who define themselves as the enemies of entropy) encourage members to put their deceased bodies on ice until scientists can one day either revive the repaired body or upload the brain-encased mind into silicon chips. The Teilhardian Internet is optimism gone ballistic.

Realists are less impressed. They are uneasy with the idealists who celebrate an electronic collective. I know people in rural communities who hear wishful thinking in the phrase “virtual community.” It sticks in their craw. For many, real community means a difficult, never-resolved struggle. It is a sharing that cannot be virtual because its reality arises from the public places that people share physically — not the artificial configuration you choose but the spaces that fate allots, complete with the idiosyncrasies of local weather and a mixed bag of family, neighbors, and neighborhoods. For many, the “as-if community” lacks the

rough interdependence of life shared. And here is where the naive realist draws the line. The direct, unmediated space we perceive with our senses creates the spaces where we mature physically, morally, and socially. Even if modern life shrinks public space by building freeways, and even if the “collective mind” still offers interaction through computers, the traditional meeting places still allowed social bonds to be built on patience and time spent together. This the bottom line for realists.

It is no surprise, then, for realists when they hear that the Internet Liberation Front is bringing down the Internet’s Pipeline for six hours, when Anti-Semitic hate groups pop up on Prodigy, when *Wired* magazine gets letter-bombed, or when Neo-Nazis work their way into the German Thule Network. The utopian communitas exists as an imagined community, as the Mystical Body. Real community exists where people throw their lot together and stand in face-to-face ethical proximity. Computer hardware may eventually allow us to transport our cyberbodies, but we are just learning to appreciate the tradeoffs between primary and virtual identities. Put the New Jerusalem on hold until we phone security.

Virtual Realism

Both naive realism and network idealism belong to the cyberspace backlash. They are two sides of the same coin, binary brothers. One launches

forth with unreserved optimism; the other lashes back with a cry to ground ourselves outside technology. Hegel would have appreciated their mutual opposition while betting on an eventual synthesis. Unfortunately, no synthesis is in sight. A collision may be imminent. We are looking at an opposition of primal forces, as basic as love and death. One critic, in fact, recently used these very terms in attacking a passage in my previous book, The Metaphysics of Virtual Reality. The critic, Gabriel Brahm, edited a collection entitled Prosthetic Territories: Politics and Hypertechnologies, in which he wrote:

Michael Heim is correct when he states that “We love the way computers reduce complexity and ambiguity, capturing things in a digital network, clothing them in beaming colors, and girding them with precise geometrical structures. We are enamored of the possibility of controlling all human knowledge .We feel augmented and empowered... This is Eros.” But Heim is incorrect in his evaluation of this drive to capture and control. One might respond that this, if anything, is Thanatos. The desire for rational calculated control of a predictable total environment in digital form truly has more to do with the death drive than with the love of life.¹

¹¹ Prosthetic Territories: Politics and Hypertechnologies, edited by Gabriel Brahm and Mark Driscoll (Boulder: Westview Press, 1995), 106. The citation of the author's The

I agree with Mr. Brahm that computer simulations belong as much to the death wish (Thanatos) as to Eros. Ancient Greek mythology considered Eros and Thanatos to be twins. Passion and morbidity, Eros and Thanatos deeply intertwine. When Eros draws us to marry someone outside ourselves, someone powerfully attractive, we give up more and more of ourselves, even to the point of extinction and self-immolation. This is true of our relationship to computers. We see something of ourselves in computers. We embrace the perfection that satisfies one side of our rational nature. What I called “the paradoxical terrain of cyberspace” (in *Metaphysics*) is an infoscape containing ecstatic heights as well as abysmal fissures. *The Metaphysics of Virtual Reality* cites a lover in William Gibson’s novel who possesses all the computerized information about his beloved, but for him the mystery of the being of his beloved has vanished. The beloved has become dead numbers, and ceased to be living mystery, because she has been digitized. If we want to survive well, we must understand this dual nature of our passion. We have to live with it. We must balance the idealist’s enthusiasm for computerized life with the need to ground ourselves more deeply in the felt earth affirmed by the realist as our primary reality. This uneasy balance I call “virtual realism.”

Virtual realism walks a tight rope. The delicate balancing act sways between the idealism of unstoppable Progress and the Luddite resistance to virtual life. The Luddite falls out of sync with the powerful human energies

Metaphysics of Virtual Reality (Oxford and New York: Oxford University Press, 1993) is found on page 85.

promoting rationality for three centuries and now blossoming into the next century. The Idealist falls for the Progress of tools without content, of productivity without satisfaction, of ethereal connections without corporeal discipline. Both inclinations — naive realism or futurist idealism — belong to the current of our time. This long thin rope stretches across the chasm of change and permits no return. Indifferent standstill is even more dangerous. The challenge is not to end the oscillation between idealism and realism but to find the path that goes through them. It is not a synthesis in the Hegelian sense of a result achieved through logic. Rather, virtual realism is an existential process of criticism, practice, and conscious communication.

What is the path of virtual realism? Virtual realism parts with realism pure and simple. Realism often means lowered expectations. “Being realistic” often implies reducing or compromising ideals. Historically, in fact, realism often follows periods of high idealism. The pendulum swings back because it had swung so high in the first place. No movement of history begins, however, without an initial affirmation, without a first postulate affirming that it has cleared the mist and found reality. Realism begins as a sober criticism of overblown, high-flown ideals. Yet at the core of realism is an affirmation of what is real, reliable, functional. Today we must be realistic about virtual reality, untiringly suspicious of the airy idealism and commercialism surrounding it, and we must keep an eye on the weeds of fiction and fantasy that threaten to stifle the blossom. At the same time, we have to affirm those entities that VR presents as our culture begins to inhabit cyberspace. Virtual entities are indeed real,

functional, and even central to life in coming eras. Part of work and leisure life will transpire in virtual environments. So it is important to find a balance that swings neither to the idealistic blue sky where primary reality disappears, nor to the mundane indifference that sees in VR just another tool, something that can be picked up or put down at will. The balancing act requires a view of life as a mixed bag, as a series of tradeoffs that we must first discern and then evaluate. Balancing means walking a pragmatic path of involvement and critical perception.

In Electric Language (1987), I developed a theory of cultural tradeoffs as they happen during ontological shifts. There I described in detail the tradeoffs between the computerized and the traditional way of doing things. In Electric Language, this meant the specific tradeoffs between electronic and printed texts. The method used was phenomenology, a way of describing the different ways in which we read and write, specifically to contrast reading and writing with computers and with traditional books. Such descriptions highlight the psychic frameworks of two very different ways of reading and writing — not from the viewpoint of the economic, social, and legal products of the written word. The tradeoffs described in Electric Language belong to what I called “the ontological shift.” The ontological shift was not a reference to the shift from managing atoms to managing bits. Our practical life using symbols never did move in the element of atoms, for atoms are scientific abstractions. The abstractions of science drawn from the atomic level have had an enormous impact on history, but that impact came not from a change at the core of culture but from the pressure that

bore down on the surface of politics, warfare, and the production of energy. Culture only slowly took into account the atomic age. Atoms are abstractions, just as bits and bytes are abstractions. But while bits and bytes abstract from a computational process, they touch information, and information reaches to the core of culture.

The ontological shift described in Electric Language occurs in what I called “the tectonic plates of culture,” the unnoticed cultural element that supports — at different times in different ways — the symbols of language. No longer papyrus or paper, the new element is digital information. The element belongs to the psychic framework of life, not to the abstractions of physics or the sciences. The symbol element is where much of practical culture transpires. It is where we store our memory, where we record our history, and where the sacred things are preserved. Most important to virtual realism is the sense of history behind the ontological shift. We need the large perspective on cultural change and the way symbolic elements mutate in history. The big picture is crucial for virtual realism, for only from that broad perspective can we envision the tradeoffs that occur in historical drift. This is not the place to go further into these notions. An interested reader can find in the first three chapters of Electric Language one approach to that larger history with its ontological shifts.

An important component of virtual realism is what I call “technanalysis.” Technanalysis — as the term suggests — is the analysis of technologies, and the analysis proceeds from a critical but practical standpoint. It is a critical strategy for describing specific technologies, a style of thinking appropriate for walking the

fissures of a culture in transition. Whether right or wrong in its conclusions, each attempt at technalysis brings to language the human encounter with specific technologies. Detailed analysis of specific technologies has significant advantages over the wholesale rejection of technology found in writers from Ellul and Baudrillard to the Unabomber. The wholesale suspicion of technology as a monstrous Leviathan supposes that we can extricate ourselves sufficiently from automobiles, telephones, and computers in order to arrive at a negative assessment and eventual disengagement. This suspicion directs its gaze at a monster whose features must remain vague and remote. Fear of the giant technology monster blinds the critic from seeing detail in daily life as we install technologies and as we install ourselves into technological environments. Blind to details, such critics close off the possibility that their analysis might contribute something of value to the concrete planning of future systems. Instead, they maintain a posture of hostility — a posture which draws considerable effort for no constructive dividend. The advantage of technalysis — the detailed phenomenology of specific technologies — resides in its working alongside “human factors” engineering, which, however remote from its participants, places the human being at the center of technology.

Virtual realism meets destiny without being blind to the losses of progress. It strives to enrich the unfolding future from a personal standpoint by referring to moments when we have been at our best. As we look beyond alphabetic writing, increasingly away from symbolic processes and towards virtualized processes,

our path must be one of virtual realism. Some signposts along this path are listed below.

- **Be clear what virtual reality is in the strong sense**
(see “VR 101”) and virtual realities in the loose, popular sense. The strong meaning implies full sensory immersion — not keyboards and monitors. The keyboard and the monitor are relics of typewriters and television sets. The screen, the keyboard, the joystick, and the trackball are a far cry from immersive technologies. We associate them with “virtuality” only in the weakest popular sense. By maintaining a stronger meaning in our vocabulary, we permit a dialogue with information systems engineers who are developing full-sensory systems. Sloppy semantics leads to false panic, confusion, and a breakdown of communication between the engineering and the non-engineering communities. At the same time, careful criticism can carry the energies of both extremes through a middle path. If a middle way does emerge, then we will have earned the new word technalysis, a word that means the informed public criticism of technologies before they become the invisible furniture of daily life.

- Acknowledge the new layer of reality and the complex relationship with computers it brings about. **Avoid glib exaggerations such as “Now we’re cyborgs,” or “Everything’s virtual reality.”** Look to the reality shift as an increased power to envision ourselves inhabiting artificial worlds, but do not obscure the gap between primary and virtual realities. Primary reality never consisted of atoms but always included the felt awareness of ourselves as bodily energies.
- **Refuse to fear an all-pervasive technology monster.** Computers can indeed become control instruments to oppress human beings, but it is up to us to adapt them critically to our human world. Adapting information systems to enhance planetary life is InfoEcology. InfoEcology softens the cyberspace backlash by clarifying transitional techniques where virtual relates to real worlds.
- We no longer need to believe we are re-presenting the real world of nature. **Virtual worlds do not re-present the primary world.** They are not realistic in the sense of photo-realism. Each virtual world is a functional whole that can parallel, not re-present or absorb the primary

world we inhabit. Denouncing artificial worlds as distractions from the real world is just as off-balance as wanting to dissolve the primary world into cyberspace.

- Realism in virtuality refers not to photo-realistic illusions or representations. Reality also means a pragmatic functioning in which work and play fashion new kinds of entities. **VR transubstantiates but does not imitate life.** Art and artistic design show us how to experiment with novel entities and with constructed worlds. VR technology is about entering worlds and environments, and worlds arise from humans adapting things through pragmatic functioning.
- Current hardware and software permit us to glimpse the virtual world, but we stand only at the doorstep of virtual reality. We should therefore **bracket the current attacks on “virtual life” and “virtual communities.”** Much contemporary vocabulary anticipates a technology whose true impact remains unclear. The shared language can knit a feedback loop between engineers and lay persons as long as the words are guided by clear perceptions. We must be wary of the language used to

sell technology and not confuse it with the vocabulary of critical feedback.

- By 2015, Virtual reality will deliver functional realities where the hardware and software recede into the background and the tasks of virtual life become foreground. Until then, VR remains a “technology” in the sense of something that doesn’t quite work yet, that remains unassimilated and unready for prime time. **Now is the time for constructive criticism, while the electronic layer of reality remains largely in prototype on the drawing boards.**
- **Realism in VR results from pragmatic habitation, livability, and dwelling,** much more than from scientific calculation. The social transition to cyberspace is, therefore, as important as the engineering research. A virtual world can achieve a functional isomorphism with a primary world — it does not have to re-present the primary but only to foster a similar livability.
- We need to watch closely how cyberspace intersects geo-physical space. InfoEcology — the study of how information systems can be fitted to enhance of life —

becomes a top priority. Observe closely those **spots where high-end VR touches earth-centered applications** (see the chapter “InfoEcology” for one example).

- It’s not realistic to say, “Okay, we’re cyborgs and we can remake ourselves any way we want; we can change identities, genders, etc.” Where idealism overreaches, pragmatism can intervene and help. VR can help us **look closely at the bio-psychic imbalances created by computer technology**. With its simulations and varied input/output devices, VR can help us critically examine the stress that pervades our culture. Virtual reality can integrate the individual whose neuro-physiology has been torn apart by violence, anxiety, and incessant shock. Neither idealistic nor realistic, virtual realism points to a path of pragmatic healing.

These are the ten steps through the narrow gate of Virtual Realism. They are signposts that deliberately emphasize clarity about names and concepts. The right name illuminates and enlightens, as we learn from Genesis. Getting the right name goes beyond utility. It touches ethics and civic life, as Confucius

taught in the ancient “rectification of names.” The right words help us harmonize with things. If language terrifies one part of the populace and over-stimulates another, then we have not found the right words. If our language sinks below the clear understanding of things, then we lose the bonds that bring us to speak the same language. Mutual silence is the seed of hatred and the father of violence. Fiction and fantasy can foster communication about technology, but it can also reduce communication. Beware of fictional language that obscures rather than facilitates the discussion of technology.

Measure your understanding of these ten signposts of Virtual Realism by testing yourself against Bill Gates. The chairman of Microsoft appeared in an interview conducted by David Frost which first aired on public broadcasting in November, 1995. Frost cited a passage from The Metaphysics of Virtual Reality where I argued that the extended use of VR is likely to alter our sense of reality. Gates responded by pointing out that the most virtual of activities is the activity of reading a book or other printed material. If reading doesn't make the average person withdraw from the world and other people, Gates argued, then the new media won't either. Stop for a moment and consider Gates's response. Measure it against the ten signposts above. Ask yourself what will most likely happen if software designers and their managers do not understand the semantic steps leading from VR 101 through the narrow gate of Virtual Realism. What does this understanding bode for the culture that produced the Unabomber?

Because the new reality layer brings an ontological shift, we have been thrown, every one of us, into the roles of reality theorists and metaphysicians. To help us find balanced words, we could do worse than listen to the great French critic, Joseph Joubert (1754-1824), who wrote:

The true science of metaphysics consists not in rendering abstract that which is sensible, but in rendering sensible that which is abstract; apparent that which is hidden; imaginable, if so it may be, that which is only intelligible; and intelligible, finally, that which an ordinary attention fails to seize.²

² Matthew Arnold cites the Joubert quotation in his Essays In Criticism: First Series (New York: Macmillan, 1898), from the essay "Joubert."

Books Mentioned

Birkerts, Sven. *The Gutenberg Elegies*. Boston: Faber & Faber, 1994.

Brahm, Gabriel, and Mark Driscoll. *Prosthetic Territories: Politics and Hypertechnologies*. Boulder: Westview Press, 1995.

Brook, James, and Iain Boal. *Resisting the Virtual Life*. San Francisco: City Lights Books, 1995.

Gelernter, David. *Mirror Worlds: The Day Software Puts the Universe in a Shoebox*. New York: Oxford University Press, 1992.

Heim, Michael. *Electric Language: A Philosophical Study of Word Processing*. New Haven: Yale University Press, 1987, 2nd edition 1998.

----- . *The Metaphysics of Virtual Reality*. New York: Oxford University Press, 1993.

Kroker, Arthur, and Michael W. Weinstein. *Data Trash*. New York: St. Martin's Press, 1994.

McKibben, Bill. *The Age of Missing Information*. New York: Plume, 1992.

Romanyshyn, Robert. *Technology as Symptom and Dream*. New York: Routledge & Kegan Paul, 1989.

Rushkoff, Douglas. *Media Virus*. New York: Ballantine Books, 1994.

Sale, Kirkpatrick. *Rebels Against the Future: The Luddites and Their War on the Industrial Revolution*. Reading, Massachusetts: Addison-Wesley, 1995.

Slouka, Mark. *War of the Worlds: Cyberspace and the High-Tech Assault on Reality*. New York: Basic Books, 1995.

Stoll, Clifford. *Silicon Snake Oil: Second Thoughts on the Information Highway*. New York: Doubleday, 1995.

Talbott, Stephen L. *The Future Does Not Compute: Transcending the Machines in Our Midst*. Sebastopol, California: O'Reilly & Associates, 1995.

Unabomber Manifesto. Indexed on the Web at:
<http://www.hotwired.com/special/unabom/list.html>.