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In the Beginning Was Information

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by Vaden House

well-being for as long as we live, and cooperates with our safe and hygenic disposal when at last we have to die. An electronic alarm awakens us; an electronic sound system assists us in public worship; computers are used to create stories, poems, and sermons, and to manipulate and tabulate facts and information about us that even God might want forgotten.

The issue is not simply one of widespread use of technological devices. The use of most of these instruments depends on extremely large, complex, and powerful institutions. The defense industry, for example, involves the cooperation of thousands of scientists, engineers, economists, politicians, and public relations personnel. Furthermore, many of our technological objects require elaborate and expensive support systems. For example, the private automobile requires massive refineries, huge tankers, thousands of local gas stations and service centers, a vast network of highways, streets, and bridges. These in turn require maintainence and repair. We also require a system of law enforcement involving thousands of police and court personnel to maintain driving safety.

There can be little doubt that the effects of the pervasiveness of technology extends not only to what we eat, what we wear, and how we die, but also to our understanding of ourselves while we live. That is, the impact is not only out there, in the world of things, but also inside, in our own sense of ourselves, in our view of our place and calling in the universe. I refer not only to the impact that mass media technology like televison has on

1. The broad picture

Technology is an intricate and even indispensible part of the production and distribution of just about everything used by most of us. We wear technologically produced synthetic fibers. We eat technologically processed foods. We amuse ourselves with video machines, TVs, radios, records.

We inform ourselves with newspapers and books which are produced and distributed by elaborate technological devices. We travel on airplanes utilizing propulsion methods that most of us barely understand and are assisted by computers and radar tracking devices that we understand even less. Medical technology monitors us in the womb, assists our passage down the birth canal, monitors and, we hope, contributes to our

molding our values, but on the more subtle influences that clocks have on our sense of time, that automation has on our experience of work, that nuclear weapons have on our view of security, that vibrators have on our understanding and experience of sex.

In a profound sense, we are cyborgs, part machine, part organism. By means of technological devices we extend our bodily being in the world. In some cases the prosthetic extension of embodiment is obvious as, for example, when we use eye glasses to enable us to see better and longer. But we might usefully see microscopes and telescopes and automobiles in the same way, as prosthetic extensions of the body that alter both us and the world we live in.

If we understand technology in that fashion, as human shaping and forming, not only of our physical environment, but in a real sense, of our very selves, this gives us, I think, a useful angle of vision from which to ask about information technology. Information technology is an extension of our symbolic capacities. If we are going to exercise our responsibility in relation to these technologies, then we need to ask both about the motives that lead us to extend our capacities in this particular way and about some of the likely outcomes of the rapid extension of our informational capacities in an age of digital computers, fibre optics, and satellites. What happens to our attention span in the age of the soundbite? What happens to the places in which we live when they become virtual space, cyberspace? What happens to community when it takes place in cyberspace? What happens to our identity when we can put it on and take it off at will, when it is as transient as the virtual meeting we just had in a chat room on the Web?

I can only hint at answers to these questions here. But I think that the spirit that underlies much of the development and use of the latest information technology is modernist in character and profoundly hostile to any Christian understanding of human life in the world. And I think that the transformations envisioned by the apologists for information technology are self-contradictory, impossible, and self-destructive.

2. Geneology of a god-word

In his racy *Being Digital,* Negroponte tells us that bits are bits—that what makes the new digital communication technology so incredibly important and different is that it will astronomically increase our control over our own lives. He pictures us as powerful consumers of bits. Bitcasters, using the internet, satellites, cellular phones, etc., will send "information" complete with digital headers that tell us what is contained in the messages and we will be able to decide what we want to hear and see. Much like the information contained on a CD ROM concerning the length of the next selection, we could send out information about our upcoming transmissions about their contents, and we can decide whether we want to "buy" the forthcoming information or not. Negroponte envisions buying and selling bits all over the place. We can make collages out of bits gathered from the four corners of the globe. We can have different versions of a movie depending on our tastes for or against sex or violence. We can customize our news, both in terms of content and in terms of presentation. Depending on our hardware we can have our newscasts in print, with or without colour, sound, video. We can add musical overlays. We become, so to speak, the co-creators of the spectacle. The boundary between creator and audience is blurred.

Some see this as a degenerate post-modernist fantasyland where everyone's an artist and everything goes (Wolfgang Schirmacher in *Bender,* 68). I see it as an extension of the modernist vision of the world. This is not post-modernism but hypermodernism.

Well there. Now I've gone and done it. Said the p-word. But don't worry, it's not the p-word I want to concentrate on but the m-word. It's impossible in very brief compass to say a lot about something as complex as modernism, but let me make a collage and at least hint at why I think that insofar as information technology bears any resemblence to Negroponte's vision, then it is a hypermodernist nightmare.

Any attempt to say something meaningful about modernism in short compass runs the risk of triviality. But in this context we'll have to settle for industrial strength generalizations. One dominant feature of modernism is its flight from authority (Jeffrey Stout, *Flight From Authority*). The notion of autonomy lies at the very heart of

modern Western culture. When Marx proclaimed that the proper confession of the philosopher is "I hate all the gods that do not worship human self-consciousness as the highest divinity," he captured a crucial aspect of the spirit of modernism in a nutshell. J. P. Sartre expresses the heart and soul of the modern West when he has one of his characters say, "If God existed it would be necessary to kill him."

God becomes in the West the hated symbol of anything and everything that limits the human will to power. When Nietzsche proclaims the death of God, he puts in the place of the departing gods human self-creation with limit. Oddly, perhaps, but understandably, this goes hand in hand in the modern West with developements in the sciences that on the face of it might seem to be quite inimical to human self-creation, self-expansion, and total freedom, namely a preference for atomistic and mechanistic understanding of the universe.

In *Sources of the Self* Charles Taylor argues that mechanism meant the end of the neo-Platonist world picture with its ontic logos which set limits to both divine and human action (Taylor, 1989: 161). The nominalist revolt against realism rooted in Occamist theology and originally focused on the absoluteness of divine freedom, gets pressed into service in the interest of human freedom and control. Part of the motivation for mechanism was an interest in a non-teleological morality. The disenchantment with nature and the preference for mechanism provide a sphere of human action without natural limit.

Let me suggest that there is a deep coherence between the atomistic physics, the political individualism, the idea of isotropic space, the development of an abstract system of exchange (the market system) and now the digitization of information.

The crucial feature of atomism is that it gave rise to the idea of all of the diversity of the world being reducible in some sense to the behavior of atoms governed by the laws of motion. The notion was born that we could make and unmake anything simply by configuring atoms in the right way. This notion got a further boost when we discovered the micro-structure of the atom and the phenomenon of radioactivity. In a real sense we

rediscovered alchemy.

Modern technoscience is properly understood as a kind of alchemy, as the successful search for the power not just to hammer and melt things into the shapes we want, but to transmute them from one kind of thing into another by changing the inner structure of the very materials themselves.

We can see the spirit of this enterprise very clearly in H. J. Muller, a classical geneticist who saw himself as seeking a biological equivalent of the atomic nucleus. He saw a direct parallel between radioactive transformation of elements and the mutation of species. He speculated that if

> *. . . if we could find a way to control mutation, we would be as gods, . . . have unthinkable stores of concentrated energy.*

we could influence radioactive decay we would have inanimate matter entirely at our disposal. Likewise, genes are the ultimate elements of living matter. And if we could find a way to control mutation, we would be as gods. We would have, in his words, unthinkable stores of concentrated energy. According to Muller, Mutation and Transmutation [are] the two keystones of our rainbow bridges to power (In *Fox-Keller*, 58). He speaks of science as a form of necromancy that will give us control over the forces that make and unmake our living worlds.

Space in Newtonian physics is isotropic or homogenous. Just as all atoms were supposed to be identical lumps of matter and all diversity constructed by configuring those lumps, so space is the same in all directions. There is no center. There is no higher and lower. Up and down are revealed as anthropocentic projections rooted in the physical structure of the human body (up is where your head is). The ordinary human experience of place is challenged by the scientific leveling out or down of space to the abstract infinity stretching identically in all directions.

To anticipate for a moment, cyberspace is a kind of virtual Newtonian space. This is not a human place. Some of us might have a fondness for our Web site, and cyberspace could be made

more like a meeting place where real humans interact with other real humans in complex ways over time. But the browser itself tells you something of what cyberspace is. To quote Simon Penny, "In this world of unhindered voyeuristic desire, what the eye wants the eye gets (*Bender*, 293). Like channel surfing on TV, this is the home of the shape-shifter, of the distracted, detached, bored self, looking for someone/something to catch its attention for a few moments while we refuse to take shape in time, to make commitments to have "a local habitation and a name." Having tasted some "information" on the great smorgasboard we move on, sampling wares from everywhere, coming down to earth nowhere. The site address, like your coordinates in physical space, make only the most abstract connect between you and the earth. Cyberspace is the same in all directions. In your freedom as a sovereign consumer, you might visit some coordinates more often than others depending on your moods or your tastes. But despite the misnamed "Home Page" you have no home. Homes belong to place, to embodied love commitments, to work and sorrow, to ecstasy and anguish, to life and death. Your home page is a tiny fragment sundered from that rich tapestry and made to stand proxy for your bleeding, aching, longing, wondering, worshiping self.

Humans in the modernist scheme are themselves abstract beings. They are primarily understood as surveyors of abstract space and manipulators of the machinery of nature by means of techno-scientific knowledge. This role of master of the universe is enabled by a kind of disembodiment. This was true even when dualism was rejected. Somehow the power of scientific rationality conferred on its possessor (generally understood as essentially mind) the power to direct the powers of the earth to the ends of humans.

This vision is nowhere more apparent than in the development of the market system as a means of distribution of goods and services during and after the industrial revolution. Everything about the economic system bespeaks the same kind of abstraction of humans from the world. We produce as extensions of industrial machinery. Workers became modules, functioning as parts of factories. The assembly line methods of production usually involved further abstraction in

that usually a worker produced an isolated part of some product or assembled parts made by others. The producers made products primarily for use by others.

The consumptive process is equally abstract. Consumer goods tended to become more and more throw-away, use and dispose, items rather than playing some lasting role in the life history of humans. The goods and services tend to be purchased in abstraction from the identities and life histories of the sellers and the buyers (you don't care about who buys or sells but is the product serviceable to my ends and at what price). Theoretically, at least, this whole process is itself supposed to be undirected by human will. The will of the individual consumer or producer is to handle goods for self-chosen ends (profit, pleasure). The system itself is supposed to be autonomic, a self-regulating mechanism where the self-interested pursuit of individual good automatically produces general welfare.

The vision of life in the information society celebrated by writers like Toffler, Naisbitt, Negroponte, and a host of others is merely an extension of this admittedly bleak picture. In this culture the essence of being human lies in the kind of control derived from sundering ourselves from the bonds to place by means of abstract space, sundering ourselves from tradition by means of methodological skepticism, sundering ourselves from community by means of abstract democaracy. Instead of caring, compassion, and economic justice, we have welfare. I could go on and on. But I want to go straight to the ultimate mad fantasy. Instead of a life bounded by beginnings and endings, enabled by vulnerable flesh, subject to suffering and death, we are offered a vision of silicon immortality. Let me quote Robert Jastrow:

When the brain sciences reach this point, a bold scientist will be able to tap the contents of his mind and transfer them into the metallic lattices of a computer. Because mind is the essence of being, it can now be said that the scienist has entered the computer, and that he dwells in it. At last the human brain, ensconced in the computer, has been liberated from the weaknesses of mortal flesh. . . . It is in control of its own destiny. . . . Housed in the indestructible

lattices of silicon, and no longer constrained in the span of its years by the life and death cycle of a bilogical organism, such a life could live forever.

Here too I see the inherent logic of modernism raised to a fever pitch. We have ourselves become information and we can be as easily stored (and more permanently housed) in a computer as in living flesh.

This same (il)logic is at work in much of what passes for commentary on life in cyberspace. Despite the fact that cyberspace interacts with the "real" world in all sorts of ways, its deep appeal seems to be its breaking free from the limits of real life in the world. Up till now, Negroponte gushes, we moved atoms about from place to place. Now we can move bits. Ignoring the fact that bitcasting (his term for digital forms of broadcasting) involves the movement of atoms, he assures us that we can have very nearly total control over how and what we receive as information. Not everything can be done bitwise (we still don't have transporters from the enterprise) but we're getting there.

How much reality can this virtual similacrum (copy) stand? Let's go back to some of the questions that I started with. To the extent that we actually manage to deliver on the promises I have in some sense been mocking, then to that precise extent we will have ceased to be human. Disembodiment, life without limit, is not a human life but a demonic illusion.

3. Reality bites

It is against this background, then, that we need to examine the hype that surrounds the so-called information age. It is claimed that we are experiencing a global revolution, a turning of the wheel of history that we either learn to ride or are ridden—steamrolled into the pavement on the information highway. It is claimed that this is a post-industrial age, that we are changing from a manufacturing economy to an information economy. Some (in fear or celebration) claim that the internet will render schools and teachers obsolete. And marching straight into the space where virtual and old-fashioned reality meet, it has been suggested that we'll be able to perform surgery in cyberspace; a single surgical expert will be able to

be virtually everywhere at once. Then skipping straight on to utopia we are assured that true participatory democracy is coming to the world riding on the information highway.

Obviously these are enormously complex questions to which I can only begin to sketch an answer. But, brief or no, it is necessary to interrupt this rhapsodic, hyperbolic, oracular hype and do a reality check.

a. Can information be mass-produced and marketed by the kinds of "bitcasting" described by Negroponte? Are databases oracles? Do they provide a neutral data source from which

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autonomous, individual surfers in cyberspace will be able to buy and use at will?

To answer this one we need to do a bit of spade work on the idea of information. Norman Wiener defined information as negentropy, as an entropy-reducing ordering process. In classical information theory the distinction between the physical substratum of information and information itself is blurred and the human role in the genesis and use of information is ignored. But it is essential to remember that people produce signals. Signals have meaning by virtue of their having been given form by human activity. Information exists only in relationship to the human form-giving activities. In information we structure energy for human comunicative purposes. We cannot reduce signs, signals, or information to purely physical phenomena.

When we understand cause and effect relationships between phenomena, we can say that the gathering clouds "mean" that its going to rain but clouds don't mean anything in the semantic sense. They aren't literally senders of signals. They don't know anything, aren't intending anything, aren't communicating information. We take one phenomenon (clouds) as indication of another (rain) because we understand the structural relationship between the two.

Language does not mean. Not even words and

sentences are information in abstraction from language users. Words don't mean—speakers and writers do. This is very important for understanding what we have inbedded in various forms of information technology. What is stored in databases, transmitted via satellites and the internet, is information only in relationship to human beings. Its cognitive functions are object functions, functions that it has only by being related to humans functioning as cognitive subjects. Musical scores are not music. 2+2=4 is not true. They are just chalk or ink or electricity unless it is used by humans as a means of relating to the multiplicity of discrete realities.

My point here is not that the concept of information cannot be extended metaphorically (so that we can talk about genetic codes as language) but we need to reject the opposite movement which encourages us to think about information without knowers and language users without repsonsible agency. The original meaning of "information" is the intentional symbolizing activities of human speakers and writers.

This relates immediately to my title. The near blasphemous rewrite of the prologue to John's gospel is from a book by Fred Dretske called *Knowledge and the Flow of Information.* Dretske is trying to conceptualize the relationship between information pickup (understood as the firing of our neural receptors) and knowledge. Knowledge is the messy stuff fraught with complexity and fallibility. Somehow the electrical-chemical processes involved in the interplay between the physical universe and our sensory equipment is tranduced into knowledge that can be expressed in language. Dretske is pinning his hopes for reliable knowledge on whatever it is that goes on at the level of physics and chemistry. It is first. It is what matters. It is what feeds the knowledge process. Before human judgement and choice and potential failure, there is the security of the sensory aparatus firing in response to physical stimuli providing an anchor between us and reality.

My intention is not to deny that such physical and physiological processes are important to human knowing. It is rather to insist that human responsibility goes all the way down. We don't get to be infallible at some level because somehow electrical-chemical processes contribute to sensa-

tion and ultimately to knowledge. I simply want to insist that until humans take something to be the case, until we exercise judgement, until we formulate those judgements in language, we don't have communication or information; we just have electricity. Or chalk. Information is not neutral raw material. It is always already humanly constituted, formed energy in the service of some human end.

The upshot of all this is that information has what Michael Polanyi calls a fiduciary component. Information (like its close relative, knowledge) is offered by one person to another with an implicit commitment attached. It is a kind of promisory note that says "I testify that this is true. You can trust me." Placed in cyberspace, rendered anonymous, sundered from accountability, it threatens to become mere noise. Only persons with identity and communal accountability can give information. Sundered from this context, it becomes the mere traces or residues of alien life. The most we can say of it perhaps is that it is information fossils. It is, of course, possible to structure cyberspace so that accountability is part of our interactions, so that anonymous bitcasting is ignored as mere noise or disallowed. When the ideas in the "marketplace" of cyberspace impinge on the real world, when we act on information and count on its truthfullness, we might well see the development of various consumer protection schemes. For now its *caveat emptor*—let the buyer beware.

Databases are as reliable as their makers, namely us. They are subject to the gigo principle (garbage in, garbage out). We also need to recognize that they structure information in certain ways, contain answers to questions posed by human beings, and that those questions and concepts and categories carry all of the limitations of their creators.

b. All of this has a bearing on the question regarding the limits of encoding information and knowledge into physical media. We talk about knowledge contained in books but this container metaphor is misleading. A musical score is not music. A book is not knowledge. A database is not information. Much of the skill needed to recreate (activate the musical possibilities of a score) cannot be coded into the score at all.

Likewise, much of the knowledge that we have in most areas of human life is not readily formalizable. Even the know-how that goes into decoding texts or any other kind of symbolic communication is not itself in the text. Our ability to see the bearing of some set of symbolics—our semantic capacities—can't be rendered (or certainly not exhaustively in propositions that can be then encoded into digital form). So chances are no matter how fantastic our virtual reality gets, we won't be performing surgery over the net. The surgeon's skill is as much in her hands as in her mind and no amount of talking about what needs to be done and how to do it could be a substitute for the skillful accomplishment of the task in question. This I think also marks some of the limits we can and should expect in all forms of distance education mediated via information technology. We know more than we can tell. And that remainder is teachable only through an apprenticing process that involves hands-on, directed practice, not just abstract, self-directed reading and seeing.

c. Is this an information age? Are we undergoing some great transition into an info world?

Information has been part of human life in all times and places. What is new in our time is the technical infrastructure by means of which we communicate. No one should underestimate the potential transformations of our very selves and our world as a result of those developments. But the world and our lives in it are more than information.

Furthermore, there are serious tensions in the multiple uses we keep finding for the word "information." We link it to the genetic code (surely not something new, in human time). We even link it to physical signals and the process by which the cosmos came to its present form from the big bang to now. And we link it to the development of digital devices and satellites. The biological and cosmological uses of the term "information" certainly undermine any claim that the information age is a new-fangled product of superconductors.

d. Are we moving out of the manufacturing business and into information?

I can't do better than to quote Roszak:

We might almost believe that we will soon be living on a diet of floppy disks and

walking on streets paved with microchips. Seemingly there are no longer any fields to till, any ores to mine, any heavy industrial goods to manufacture; at most these continuing necessities of life are mentioned in passing and then lost in the sizzle of pure electronic energy somehow meeting all human needs painlessly and instantaneously. (Roszak, 22)

Roszak goes on to wonder how we could even have information technology if somewhere, somehow we don't manufacture that technology. Relocating the manufacturing to Taiwan, Korea, and Hong Kong (a likely scenario) doesn't

> *There'll be no democracy at all if the whole political process degenerates into polling.*

eliminate our dependence on manufacturing; it only raises ethical questions about our use of cheap labor in areas with weak emissions controls.

e. Will information technology bring us all together into a worldwide community? Will it make true participatory democracy possible?

The problem with the hypesters who promote this fantasy is that they understand democracy and community as simply a matter of counting votes. Each of us inhabits our individual "space" and makes up his or her mind by consulting the I Ching or the Bible or our pet poodle or tea leaves or the TV set or the magazine ads or whatever. Then we decide, without communal debate, unless we are going to use the term "debate" for the often mindless, frequently vitrolic "flaming" that goes on on the internet.

There'll be no democracy at all if the whole political process degenerates into polling. There'll be no community. Not in cyberspace! Not, that is, if we let the Web have the character of an abstract space where identities are blurry or non-existent, where anonymity is the order of the day, where there are no consequences, no shared life, no shared struggle. Politics is about the "polis," not polling. It is about the public space where we share responsibility for shaping the public good. We should resist the vision of democracy as polling anonymous, faceless, market manufactured

selves, faces aglow with the light of a CRT. This is not politics but something else. Maybe soft despotism. Maybe a tyranny of the majority. Maybe a brave new world. But not a community of justice and peace.

Conclusion

Let me summarize what I've been trying to say.

1. Information technology (IT) is a prosthetic extension of human symbolic functions. We need to ask about the motives and likely consequences of latering ourselves and our world in this way.

2. Popular assessments of the developments of IT are often utopian and naive both with respect to the economic, political, moral, and religious motives that direct the development of IT and about the possible transformations of human life that will accompany its development.

3. "Information" is what Roszak calls a god-word. It is one of those words (like freedom, democracy, justice, love) that we don't so much argue for as argue from. Our god-words usually encode some fundamental hope that we have about our lives and our future.

4. This particular god-word represents a variation on a theme that has been with us at least since the 17th century. It is the latest way of talking about increasing human power and freedom by means of knowledge scientifically acquired and technologically mediated and applied.

5. The notion of cyberspace is just a fusion of the modernist idea of abstract space, the market, and some new-fangled ideas about information.

6. The utopian promises of IT commentators can't be fulfilled because they all accept the impossible idea of humans as abstract individuals operating in abstract space with the world as raw materials.

7. Most real-world human functions, including politics, education, and surgery, could be served by IT but will only be deformed if we try to make IT serve not a fully creaturely human life but the life of abstract, autonomous, individual shoppers in the supermarket of ideas.

Our technological artifacts are intertwined into our (to some extent, self-created) identity as a culture. They reveal us to ourselves and make us who we are. It makes a certain sense to ask "what do Swiss watches reveal about the Swiss, miniturized electronics reveal about the Japanese, precisely scheduled trains about the Germans? What is revealed about us in cyclotrons, radio telescopes, thermonuclear devices, episiotomies, induced labor, Cesarean sections, soil erosion, chemical fertilizers, or genetic engineering?" I have been arguing that information technology, at least in the some of its most recent and exciting forms, shows that our modernist heart still beats strong, that we are still dreaming the dark dream of human agency without limit in a world without consequence.

It is precisely here that the contrast between this latest version of the modernist myth and the biblical vision stands out in all its starkness. In the prologue to John's Gospel we read:

> In the beginning was the Word and the Word was with God and the Word was God. . . . The Word became flesh and lived among us, and we have seen his glory, the glory of the Father's only Son, full of grace and truth.

The hypesters of the new age of information offer us silicon immortality. God offers us resurrected life, a resurrected body. While we flee the limits of the flesh, of place, time, and community, God seeks to dwell among us in bread and wine. While we hitch our hopes to disembodied information, the Word is being made into flesh.

In the beginning was the Word.