

The Erotic Ontology of Cyberspace

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This is a chapter from Michael Heim's book *The Metaphysics of Virtual Reality*.

Cyberspace is more than a breakthrough in electronic media or in computer interface design. With its virtual environments and simulated worlds, cyberspace is a metaphysical laboratory, a tool for examining our very sense of reality.

When designing virtual worlds, we face a series of reality questions. How, for instance, should users appear to themselves in a virtual world ? Should they appear to themselves in cyberspace as one set of objects among others, as third-person bodies that users can inspect with detachment ? Or should users feel themselves to be headless fields of awareness, similar to our phenomenological experience ? Should causality underpin the cyberworld so that an injury inflicted on the user's cyberbody likewise somehow damages the user's physical body ? And who should make the ongoing design decisions ? If the people who make simulations inevitably incorporate their own perceptions and beliefs, loading cyberspace with their prejudices as well as their insights, who should build the cyberworld ? Should multiple users at any point be free to shape the qualities and dimensions of cyber entities ? Should artistic users roam freely, programming and directing their own unique cyber cinemas that provide escape from the mundane world ? Or does fantasy cease where the economics of the virtual workplace begins ? But why be satisfied with a single virtual world ? Why not several ? Must we pledge allegiance to a single reality ? Perhaps worlds should be layered like onion skins, realities within realities, or be loosely linked like neighborhoods, permitting free aesthetic pleasure to coexist with the task-oriented business world. Does the meaning of "reality" -- and the keen existential edge of experience -- weaken as it stretches over many virtual worlds ?

Important as these questions are, they do not address the ontology of cyberspace itself, the question of what it means to *be* in a virtual world, whether one's own or another's world. They do not probe the reality status of our metaphysical tools or tell us why we invent virtual worlds. They are silent about the essence or soul of cyberspace. How does the metaphysical laboratory fit into human inquiry as a whole ? What status do electronic worlds have within the entire range of human experience ? What perils haunt the metaphysical origins of cyberspace ?

In what follows, I explore the philosophical significance of cyberspace. I want to show the ontological origin from which cyber entities arise and then indicate the trajectory they seem to be on. The ontological question, as I see it, requires a two-pronged answer. We need to give an account of 1) the way entities exist within cyberspace and 2) the ontological status of cyberspace -- the construct, the phenomenon -- itself. The way in which we understand the ontological structure of cyberspace will determine how realities can exist within it. But the structure of cyberspace becomes clear only once we appreciate the distinctive way in which things appear within it. So we must begin with the entities we experience within the computerized environment.

My approach to cyberspace passes first through the ancient idealism of Plato and moves onward through the

modern metaphysics of Leibniz. By connecting with intellectual precedents and prototypes, we can enrich our self-understanding and make cyberspace function as a more useful metaphysical laboratory.

Our Marriage to Technology

The phenomenal reality of cyber entities exists within a more general fascination with technology, and the fascination with technology is akin to aesthetic fascination. We love the simple, clear-cut linear surfaces that computers generate. We love the way that 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. The appeal of seeing society's data structures in cyberspace -- if we begin with William Gibson's vision -- is like the appeal of seeing the Los Angeles metropolis in the dark at five thousand feet : a great warmth of powerful, incandescent blue and green embers with red stripes that beckons the traveler to come down from the cool darkness. We are the moths attracted to flames, and frightened by them too, for there may be no home behind the lights, no secure abode behind the vast glowing structures. There are only the fiery objects of dream and longing.

Our love affair with computers, computer graphics, and computer networks runs deeper than aesthetic fascination and deeper than the play of the senses. We are searching for a home for the mind and heart. Our fascination with computers is more erotic than sensuous, more spiritual than utilitarian. Eros, as the ancient Greeks understood, springs from a feeling of insufficiency or inadequacy. Whereas the aesthete feels drawn to casual play and dalliance, the erotic lover reaches out to a fulfillment far beyond aesthetic detachment.

The computer's allure is more than utilitarian or aesthetic; it is erotic. Instead of a refreshing play with surfaces, as with toys or amusements, our affair with information machines announces a symbiotic relationship and ultimately a mental marriage to technology. Rightly perceived, the atmosphere of cyberspace carries the scent that once surrounded Wisdom. The world rendered as pure information not only fascinates our eyes and minds, but also captures our hearts. We feel augmented and empowered. Our hearts beat in the machines. This is Eros.

Cyberspace entities belong to a broad cultural phenomenon of the last third of the twentieth century : the phenomenon of computerization. Something becomes a phenomenon when it arrests and holds the attention of a civilization. Only then does our shared language articulate the presence of the thing so that it can appear in its steady identity as the moving stream of history.

Because we are immersed in everyday phenomena, however, we usually miss their overall momentum and cannot see where they are going or even what they truly are. A writer like William Gibson helps us grasp what is phenomenal in current culture because he captures the forward movement of our attention and shows us the future as it projects its claim back into our present. Of all writers, Gibson most clearly reveals the intrinsic allure of computerized entities, and his books -- *Neuromancer*, *Count Zero* and *Mona Lisa Overdrive* -- point to the near-future, phenomenal reality of cyberspace. Indeed, Gibson coined the word *cyberspace*.

The Romance of *Neuromancer*

For Gibson, cyber entities appear under the sign of Eros. The fictional characters of *Neuromancer* experience the computer matrix -- cyberspace -- as a place of rapture and erotic intensity, of powerful desire and even self-submission. In the matrix, things attain a supervivid hyper-reality. Ordinary experience seems dull and unreal by

comparison. Case, the data wizard of *Neuromancer*, awakens to an obsessive Eros that drives him back again and again to the information network :

A year [in Japan] and he still dreamed of cyberspace, hope fading nightly... [S]till he'd see the matrix in his sleep, bright lattices of logic unfolding across that colorless void... [H]e was no [longer] console man, no cyberspace cowboy... But the dreams came on in the Japanese night like livewire voodoo, and he'd cry for it, cry in his sleep, and wake alone in the dark, curled in his capsule in some coffin hotel, his hands clawed into the bedslab,... trying to reach the console that wasn't there. (1)

The sixteenth-century Spanish mystics John of the Cross and Teresa of Avila used a similar point of reference. Seeking words to connote the taste of spiritual divinity, they reached for the language of sexual ecstasy. They wrote of the breathless union of meditation in terms of the ecstatic blackout of consciousness, the *llama de amor viva* piercing the interior center of the soul like a white-hot arrow, the *cauterio suave* searing through the dreams of the dark night of the soul. Similarly, the intensity of Gibson's cyberspace inevitably conjures up the reference to orgasm, and vice versa :

Now she straddled him again, took his hand, and closed it over her, his thumb along the cleft of her buttocks, his fingers spread across the labia. As she began to lower herself, the images came pulsing back, the faces, fragments of neon arriving and receding. She slid down around him and his back arched convulsively. She rode him that way, impaling herself, slipping down on him again and again, until they both had come, his orgasm flaring blue in a timeless space, a vastness like the matrix, where the faces were shredded and blown away down hurricane corridors, and her inner thighs were strong and wet against his hips. (2)

But the orgasmic connection does not mean that Eros's going toward cyberspace entities terminates in a merely physiological or psychological reflex. Eros goes beyond private, subjective fantasies. Cyber Eros stems ultimately from the ontological drive highlighted long ago by Plato. Platonic metaphysics helps clarify the link between Eros and computerized entities.

In her speech in Plato's *Symposium*, Diotima, the priestess of love, teaches a doctrine of the escalating spirituality of the erotic drive. She tracks the intensity of Eros continuously from bodily attraction all the way to the mental attention of mathematics and beyond. The outer reaches of the biological sex drive, she explains to Socrates, extend to the mental realm where we continually seek to expand our knowledge.

On the primal level, Eros is a drive to extend our finite being, to prolong something of our physical selves beyond our mortal existence. But Eros does not stop with the drive for physical extension. We seek to extend ourselves and to heighten the intensity of our lives in general through Eros. The psyche longs to perpetuate itself and to conceive offspring, and this it can do, in a transposed sense, by conceiving ideas and nurturing awareness in the minds of others as well as our own. The psyche develops consciousness by formalizing perceptions and stabilizing experiences through clearly defined entities. But Eros motivates humans to see more and to know more deeply. So, according to Plato, the fully explicit formalized identities of which we are conscious help us maintain life in a "solid state", thereby keeping perishability and impermanence at bay.

Only a short philosophical step separates this Platonic notion of knowledge from the *matrix* of cyberspace entities (the word matrix, of course, stems from the Latin for "mother", the generative-erotic origin). A short step in fundamental assumptions, however, can take centuries, especially if the step needs hardware support.

The hardware for implementing Platonically formalized knowledge took centuries. Underneath, though, runs an ontological continuity, connecting the Platonic knowledge of ideal forms to the information systems of the matrix. Both approaches to cognition first extend and then renounce the physical embodiment of knowledge. In both, Eros inspires humans to outrun the drag of the "meat" -- the flesh -- by attaching human attention to what formally attracts the mind. As Platonists and Gnostics down through the ages have insisted, Eros guides us to Logos.

The erotic drive, however, as Plato saw it, needs education to attain its fulfillment. Left on its own, Eros naturally goes astray on any number of tangents, most of which come from sensory stimuli. In the *Republic*, Plato tells the well-known story of the Cave in which people caught in the prison of everyday life learn to love the fleeting, shadowy illusions projected on the walls of the dungeon of the flesh. With their attention forcibly fixed on the shadowy moving images cast by a flickering physical fire, the prisoners passively take sensory objects to be the highest and most interesting realities. Only later, when the prisoners manage to get free of their corporeal shackles, do they ascend to the realm of active thought, where they enjoy the shockingly clear vision of real things, things present not to the physical eyes but to the mind's eye. Only by actively processing things through mental logic, according to Plato, do we move into the upper air of reliable truth, which is also a lofty realm of intellectual beauty stripped of the imprecise impressions of the senses. Thus the liberation from the Cave requires a reeducation of human desires and interests. It entails a realization that what attracts us in the sensory world is no more than an outer projection of ideas we can find within us. Education must redirect desire toward the formally defined, logical aspects of things. Properly trained, love guides the mind to the well-formed, mental aspects of things.

Cyberspace is Platonism as a working product. The cybernaut seated before us, strapped into sensory-input devices, appears to be, and is indeed, lost to this world. Suspended in computer space, the cybernaut leaves the prison of the body and emerges in a world of digital sensation.

This Platonism is thoroughly modern, however. Instead of emerging in a sensationless world of pure concepts, the cybernaut moves among entities that are well formed in a special sense. The spatial objects of cyberspace proceed from the constructs of Platonic imagination not in the same sense that perfect solids or ideal numbers are Platonic constructs, but in the sense that inFORMation in cyberspace inherits the beauty of Platonic FORMS. The computer recycles ancient Platonism by injecting the ideal content of cognition with empirical specifics. Computerized representation of knowledge, then, is not the direct mental insight fostered by Platonism. The computer clothes the details of empirical experience so that they seem to share the ideality of the stable knowledge of the Forms. The mathematical machine uses a digital mold to reconstitute the mass of empirical material so that human consciousness can enjoy an integrity in the empirical data that would never have been possible before computers. The notion of ideal Forms in early Platonism has the allure of a perfect dream. But the ancient dream remained airy, a landscape of genera and generalities, until the hardware of information retrieval came to support the mind's quest for knowledge. Now, with the support of the electronic matrix, the dream can incorporate the smallest details of here-and-now existence. With an electronic infrastructure, the dream of perfect FORMS becomes the dream of inFORMation.

Filtered through the computer matrix, all reality becomes patterns of information. When reality becomes indistinguishable from information, then even Eros fits the schemes of binary communication. Bodily sex appears to be no more than an exchange of signal blips on the genetic corporeal network. Further, the erotic-generative source of formal idealism becomes subject to the laws of information management. Just as the later Taoists of ancient China created a yin-yang cosmology that encompassed sex, cooking, weather, painting, architecture, martial arts, and the like, so too the computer culture interprets all knowable reality as transmissible information. The conclusion of *Neuromancer* shows us the transformation of sex and personality into the language of information :

There was a strength that ran in her, ...[s]omething he'd found and lost so many times. It belonged, he knew -- he remembered -- as she pulled him down, to the meat, the flesh the cowboys mocked. It was a vast thing, beyond knowing, a sea of information coded in spiral and pheromone, infinite intricacy that only the body, in its strong blind way, could ever read.

... [H]e broke [the zipper], some tiny metal part shooting off against the wall as salt-rotten cloth gave, and then he was in her, effecting the transmission of the old message. Here, even here, in a place he knew for what it was, a coded model of some stranger's memory, the drive held.

She shuddered against him as the stick caught fire, a leaping flare that threw their locked shadows across the bunker wall. (3)

The dumb meat once kept sex private, an inner sanctum, an opaque, silent, unknowable mystery. The sexual body held its genetic information with the strength of a blind, unwavering impulse. What is translucent you can manipulate, you can see. What stays opaque you cannot scrutinize and manipulate. It is an alien presence. The meat we either dismiss or come up against; we cannot ignore it. It remains something to encounter. Yet here, in *Neuromancer*, the protagonist, Case, makes love to a sexual body named Linda. Who is this Linda ?

Gibson raises the deepest ontological question of cyberspace by suggesting that the Neuromancer master-computer *simulates* the body and personality of Case's beloved. A simulated, embodied personality provokes the sexual encounter. Why ? Perhaps because the cyberspace system, which depends on the physical space of bodies for its initial impetus, now seeks to undermine the separate existence of human bodies that make it dependent and secondary. The ultimate revenge of the information system comes when the system absorbs the very identity of the human personality, absorbing the opacity of the body, grinding the meat into information, and deriding erotic life by reducing it to a transparent play of puppets. In an ontological turnabout, the computer counterfeits the silent and private body from which mental life originated. The machinate mind disdainfully mocks the meat. Information digests even the secret recesses of the caress. In its computerized version, Platonic Eros becomes a master of artificial intelligence, CYBEROS, the controller, the Neuromancer.

The Inner Structure of Cyberspace

Aware of the phenomenal reality of cyber entities, we can now appreciate the backdrop that is cyberspace itself. We can sense a distant source radiating an all-embracing power. For the creation of computerized entities taps into the most powerful of our psychobiological urges. Yet so far, this account of the distant source as Eros tells only half the story. For although Platonism provides the psychic makeup for cyberspace entities, only modern philosophy shows us the structure of cyberspace itself.

In its early phases -- from roughly 400 B.C. to A.D. 1600 -- Platonism exclusively addressed the speculative intellect, advancing a verbal-mental intellectuality over physical actuality. Later, Renaissance and modern Platonists gradually injected new features into the model of intelligence. The modern Platonists opened up the gates of verbal-spiritual understanding to concrete experiments set in empirical space and time. The new model of intelligence included the evidence of repeatable experience and the gritty details of experiment. For the first time, Platonism would have to absorb real space and real time into the objects of its contemplation.

The early Platonic model of intelligence considered space to be a mere receptacle for the purely intelligible entities subsisting as ideal forms. Time and space were refractive errors that rippled and distorted the mental

scene of perfect unchanging realities. The bouncing rubber ball was in reality a round object, which was in reality a sphere, which was in reality a set of concentric circles, which could be analyzed with the precision of Euclidian geometry. Such a view of intelligence passed to modern Platonists, and they had to revise the classical assumptions. Thinkers and mathematicians would no longer stare at the sky of unchanging ideals. By applying mathematics to empirical experiment, science would absorb physical movement in space/time through the calculus. Mathematics transformed the intelligent observer from a contemplator to a calculator. But as long as the calculator depended on feeble human memory and scattered printed materials, a gap would still stretch between the longing and the satisfaction of knowledge. To close the gap, a computational engine was needed.

Before engineering an appropriate machine, the cyberspace project needed a new logic and a new metaphysics. The new logic and metaphysics of modernity came largely from the work of Gottfried Leibniz. In many ways, the later philosophies of Kant, Schopenhauer, Nietzsche, and Heidegger took their bearings from Leibniz.

As Leibniz worked out the modern Idealist epistemology, he was also experimenting with protocomputers. Pascal's calculator had been no more than an adding machine; Leibniz went further and produced a mechanical calculator that could also, by using stepped wheels, multiply and divide. The basic Leibnizian design became the blueprint for all commercial calculators until the electronics revolution of the 1970s. Leibniz, therefore, is one of the essential philosophical guides to the inner structure of cyberspace. His logic, metaphysics, and notion of representational symbols show us the hidden underpinnings of cyberspace. At the same time, his monadological metaphysics alerts us to the paradoxes that are likely to engulf cyberspace's future inhabitants.

Leibniz's Electric Language

Leibniz was the first to conceive of an "electric language", a set of symbols engineered for manipulation at the speed of thought. His *De arte combinatoria* (1666) outlines a language that became the historical foundation of contemporary symbolic logic. Leibniz's general outlook on language also became the ideological basis for computer-mediated telecommunications. A modern Platonist, Leibniz dreamed of the matrix.

The language that Leibniz outlined is an ideographic system of signs that can be manipulated to produce logical deductions without recourse to natural language. The signs represent primitive ideas gleaned from prior analysis. Once broken down into primitives and represented by stipulated signs, the component ideas can be paired and recombined to fashion novel configurations. In this way, Leibniz sought to mechanize the production of new ideas. As he described it, the encyclopedic collection and definition of primitive ideas would require the coordinated efforts of learned scholars from all parts of the civilized world. The royal academies that Leibniz promoted were the group nodes for an international republic of letters, a universal network for problem solving.

Leibniz believed all problems to be, in principle, soluble. The first step was to create a universal medium in which conflicting ideas could coexist and interrelate. A universal language would make it possible to translate all human notions and disagreements into the same set of symbols. His universal character set, *characteristica universalis*, rests on a binary logic, one quite unlike natural discourse in that it is neither restricted by material content nor embodied in vocalized sound. Contentless and silent, the binary language can transform every significant statement into the terms of a logical calculus, a system for proving argumentative patterns valid or invalid, or at least for connecting them in a homogeneous matrix. Through the common binary language, discordant ways of thinking can exist under a single roof. Disagreements in attitude or belief, once translated into matching symbols, can later yield to operations for ensuring logical consistency. To the partisans of dispute, Leibniz would say, "Let us upload this into our common system, then let us sit down and calculate". A single system would encompass all the combinations and permutations of human thought. Leibniz longed for his

symbols to foster unified scientific research throughout the civilized world. The universal calculus would compile all human culture, bringing every natural language into a single shared database.

Leibniz's binary logic, disembodied and devoid of material content, depends on an artificial language remote from the words, letters, and utterances of everyday discourse. This logic treats reasoning as nothing more than a combining of signs, as a calculus. Like mathematics, the Leibnizian symbols erase the distance between the signifiers and the signified, between the thought seeking to express and the expression. No gap remains between symbol and meaning. Given the right motor, the Leibnizian symbolic logic -- as developed later by George Boole, Bertrand Russell, and Alfred North Whitehead and then applied to electronic switching circuitry by Shannon -- can function at the speed of thought. At such high speed, the felt semantic space closes between thought, language, and the thing expressed. Centuries later, John von Neumann applied a version of Leibniz's binary logic when building the first computers at Princeton.

In his search for a universal language of the matrix, Leibniz to some extent continued a premodern, medieval tradition. For behind his ideal language stands a premodern model of human intelligence. The medieval Scholastics held that human thinking, in its pure or ideal form, is more or less identical with logical reasoning. Reasoning functions along the lines of a superhuman model who remains unaffected by the vagaries of feelings and spatiotemporal experience. Human knowledge imitates a Being who knows things perfectly and knows them in their deductive connections. The omniscient Being transcends finite beings. Finite beings go slowly, one step at a time, seeing only moment by moment what is happening. On the path of life, a finite being cannot see clearly the things that remain behind on the path or the things that are going to happen after the next step. A divine mind, on the contrary, oversees the whole path. God sees all the trails below, inspecting at a single glance every step traveled, what has happened, and even what will happen on all possible paths below. God views things from the perspective of the mountaintop of eternity.

Human knowledge, thought Leibniz, should emulate this *visio dei*, this omniscient intuitive cognition of the deity. Human knowledge strives to know the way that a divine or an infinite Being knows things. No temporal unfolding, no linear steps, no delays limit God's knowledge of things. The temporal simultaneity, the all-at-onceness of God's knowledge serves as a model for human knowledge in the modern world as projected by the work of Leibniz. What better way, then, to emulate God's knowledge than to generate a virtual world constituted by bits of information ? To such a cyberworld human beings could enjoy a God-like instant access. But if knowledge is power, who would handle the controls that govern every single particle of existence ?

The power of Leibniz's modern logic made traditional logic seem puny and inefficient by comparison. For centuries, Aristotle's logic had been taught in the schools. Logic traditionally evaluated the steps of finite human thought, valid or invalid, as they occur in arguments in natural language. Traditional logic stayed close to spoken natural language. When modern logic absorbed the steps of Aristotle's logic into its system of symbols, modern logic became a network of symbols that could apply equally to electronic switching circuits as to arguments in natural language. Just as non-Euclidian geometry can set up axioms that defy the domain of real circles (physical figures), so too modern logic freed itself of any naturally given syntax. The universal logical calculus could govern computer circuits.

Leibniz's "electric language" operates by emulating the divine intelligence. God's knowledge has the simultaneity of all-at-onceness, and so in order to achieve a divine access to things, the global matrix functions like a net to trap all language in an eternal present. Because access need not be linear, cyberspace does not, in principle, require a jump from one location to another. Science fiction writers have often imagined what it would be like to experience traveling at the speed of light, and one writer, Isaac Asimov, described such travel as a "jump through hyperspace". When his fictional space ship hits the speed of light, Asimov says that the ship makes a special kind of leap. At that speed, it is impossible to trace the discrete points of the distance traversed. In the novel *The Naked Sun*, Asimov depicts movement in hyperspace :

There was a queer momentary sensation of being turned inside out. It lasted an instant and Baley knew it was a Jump, that oddly incomprehensible, almost mystical, momentary transition through hyperspace that transferred a ship and all it contained from one point in space to another, light years away. Another lapse of time and another Jump, still another lapse, still another Jump. (4)

Like the fictional hyperspace, cyberspace unsettles the felt logical tracking of the human mind. Cyberspace is the perfect computer environment for accessing hypertext if we include all human perceptions as the "letters" of the "text". In both hyperspace and hypertext, linear perception loses track of the series of discernible movements. With hypertext, we connect things at the speed of a flash of intuition. The interaction with hypertext resembles movement beyond the speed of light. Hypertext reading and writing supports the intuitive leap over the traditional step-by-step logical chain. The jump, not the step, is the characteristic movement in hypertext. As the environment for sensory hypertext, cyberspace feels like transportation through a frictionless, timeless medium. There is no jump because everything exists, implicitly if not actually, all at once. To understand this lightning speed and its perils for finite beings, we must look again at the metaphysics of Leibniz.

Monads Do Have Terminals

Leibniz called his metaphysics a *monadology*, a theory of reality describing a system of "monads". From our perspective, the monadology conceptually describes the nature of beings who are capable of supporting a computer matrix. The monadology can suggest how cyberspace fits into the larger world of networked, computerized beings.

The term *monadology* comes from the Greek *monas*, as in "monastic", "monk", and "monopoly". It refers to a certain kind of aloneness, a solitude in which each being pursues its appetites in isolation from all other beings, which also are solitary. The monad exists as an independent point of vital willpower, a surging drive to achieve its own goals according to its own internal dictates. Because they are a sheer, vital thrust, the monads do not have inert spatial dimensions but produce space as a by-product of their activity. Monads are nonphysical, psychical substances whose forceful life is an immanent activity. For monads, there is no outer world to access, no larger, broader vision. What the monads see are the projections of their own appetites and their own ideas. In Leibniz's succinct phrase : "Monads have no windows".

Monads may have no windows, but they do have terminals. The mental life of the monad -- and the monad has no other life -- is a procession of internal representations. Leibniz's German calls these representations *Vorstellungen*, from *vor* (in front of) and *stellen* (to place). Realities are representations continually placed in front of the viewing apparatus of the monad, but placed in such a way that the system interprets or represents what is being pictured. The monad sees the pictures of things and knows only what can be pictured. The monad knows through the interface. The interface represents things, simulates them, and preserves them in a format that the monad can manipulate in any number of ways. The monad keeps the presence of things on tap, as it were, making them instantly available and disposable, so that the presence of things is represented or "canned". From the vantage point of physical phenomenal beings, the monad undergoes a surrogate experience. Yet the monad does more than think about or imagine things at the interface. The monad senses things, sees them and hears them as perceptions. But the perceptions of phenomenal entities do not occur in real physical space because no substances other than monads really exist. Whereas the interface with things vastly expands the monad's perceptual and cognitive powers, the things at the interface are simulations and representations.

Yet Leibniz's monadology speaks of monads in the plural. For a network to exist, more than one being must

exist; otherwise, nothing is there to be networked. But how can monads coordinate or agree on anything at all, given their isolated nature ? Do they even care if other monads exist ? Leibniz tells us that each monad represents within itself the entire universe. Like Indra's Net, each monad mirrors the whole world. Each monad represents the universe in concentrated form, making within itself a *mundus concentratus*. Each microcosm contains the macrocosm. As such, the monad reflects the universe in a living mirror, making it a *miroir actif indivisible*, whose appetites drive it to represent everything to itself -- everything, that is, mediated by its mental activity. Since each unit represents everything, each unit contains all the other units, containing them as represented. No direct physical contact passes between the willful mental units. Monads never meet face-to-face.

Although the monads represent the same universe, each one sees it differently. The differences in perception come from differences in perspective. These different perspectives arise not from different physical positions in space -- the monads are not physical, and physical space is a by-product of mental perception -- but from the varying degrees of clarity and intensity in each monad's mental landscape. The appetitive impulses in each monad highlight different things in the sequence of representational experience. Their different impulses constantly shift the scenes they see. Monads run different software.

Still, there exists, according to the monadology, one actual universe. Despite their ultimately solitary character, the monads belong to a single world. The harmony of all the entities in the world comes from the one underlying operating system. Although no unit directly contacts other units, each unit exists in synchronous time in the same reality. All their representations are coordinated through the supervisory role of the Central Infinite Monad, traditionally known as God. The Central Infinite Monad, we could say, is the Central System Operator (sysop), who harmonizes all the finite monadic units. The Central System Monad is the only being that exists with absolute necessity. Without a sysop, no one could get on line to reality. Thanks to the Central System Monad, each individual monad lives out its separate life according to the dictates of its own willful nature while still harmonizing with all the other monads on line.

Paradoxes in the Cultural Terrain of Cyberspace

Leibniz's monadological metaphysics brings out certain aspects of the erotic ontology of cyberspace. Although the monadology does not actually describe computerized space, of course, it does suggest some of the inner tendencies of computerized space. These tendencies are inherent in the structure of cyberspace and therefore affect the broader realities in which the matrix exists. Some paradoxes crop up. The monadological metaphysics shows us a cultural topography riddled with deep inconsistencies.

Cyberspace supplants physical space. We see this happening already in the familiar cyberspace of on-line communication -- telephone, e-mail, newsgroups, and so forth. When on line, we break free, like the monads, from bodily existence. Telecommunication offers an unrestricted freedom of expression and personal contact, with far less hierarchy and formality than are found in the primary social world. Isolation persists as a major problem of contemporary urban society, and I mean spiritual isolation, the kind that plagues individuals even on crowded city streets. With the telephone and television, the computer network can function as a countermeasure. The computer network appears as a godsend in providing forums for people to gather in surprisingly personal proximity -- especially considering today's limited band widths -- without the physical limitations of geography, time zones, or conspicuous social status. For many, networks and bulletin boards act as computer antidotes to the atomism of society. They assemble the monads. They function as social nodes for fostering those fluid and multiple elective affinities that everyday urban life seldom, in fact, supports.

Unfortunately, what technology gives with one hand, it often takes away with the other. Technology

increasingly eliminates direct human interdependence. While our devices give us greater personal autonomy, at the same time they disrupt the familiar networks of direct association. Because our machines automate much of our labor, we have less to do with one another. Association becomes a conscious act of will. Voluntary associations operate with less spontaneity than do those having sprouted serendipitously. Because machines provide us with the power to flit about the universe, our communities grow more fragile, airy, and ephemeral even as our connections multiply.

Being a *body* constitutes the principle behind our separateness from one another and behind our personal presence. Our bodily existence stands at the forefront of our personal identity and individuality. Both law and morality recognize the physical body as something of a fence, an absolute boundary, establishing and protecting our privacy. Now the computer network simply brackets the physical presence of the participants, by either omitting or simulating corporeal immediacy. In one sense, this frees us from the restrictions imposed by our physical identity. We are more equal on the net because we can either ignore or create the body that appears in cyberspace. But in another sense, the quality of the human encounter narrows. The secondary or stand-in body reveals only as much of ourselves as we mentally wish to reveal. Bodily contact becomes optional; you need never stand face-to-face with other members of the virtual community. You can live your own separate existence without ever physically meeting another person. Computers may at first liberate societies through increased communication and may even foment revolutions (I am thinking of the computer printouts in Tiananmen Square during the 1989 prodemocracy uprisings in China). They have, however, another side, a dark side.

The darker side hides a sinister melding of human and machine. The cyborg, or cybernetic organism, implies that the conscious mind steers -- the meaning of the Greek *kybernetes* -- our organic life. Organic life energy ceases to initiate our mental gestures. Can we ever be fully present when we live through a surrogate body standing in for us ? The stand-in self lacks the vulnerability and fragility of our primary identity. The stand-in self can never fully represent us. The more we mistake the cyberbodies for ourselves, the more the machine twists ourselves into the prostheses we are wearing.

Gibson's fiction inspired the creation of role-playing games for young people. One of these games in the cybertech genre, *The View from the Edge : The Cyberpunk Handbook*, portrays the visage of humanity twisted to fit the shapes of the computer prosthesis. The body becomes literally "meat" for the implantation of information devices. The computer plugs directly into the bones of the wrist or skull and taps into major nerve trunks so that the chips can send and receive neural signals. As the game book wryly states :

Some will put an interface plug at the temples (a "plug head"), just behind the ears (called a "Frankenstein") or in the back of the head (a "puppethead"). Some cover them with inlaid silver or gold caps, others with wristwarmers. Once again, a matter of style. Each time you add a cybernetic enhancement, there's a corresponding loss of humanity. But it's not nice, simple and linear. Different people react differently to the cyborging process. Therefore, your humanity loss is based on the throw of random dice value for each enhancement. This is important, because it means that sheer luck could put you over the line before you know it. Walk carefully. Guard your mind. (5)

At the computer interface, the spirit migrates from the body to a world of total representation. Information and images float through the Platonic mind without a grounding in bodily experience. You can lose your humanity at the throw of the dice.

Gibson highlights this essentially Gnostic aspect of cybertech culture when he describes the computer addict who despairs at no longer being able to enter the computer matrix : "For Case, who'd lived for the bodiless exultation of cyberspace, it was the Fall. In the bars he'd frequented as a cowboy hotshot, the elite stance

involved a certain relaxed contempt for the flesh. The body was meat. Case fell into the prison of his own flesh" (6). The surrogate life in cyberspace makes flesh feel like a prison, a fall from grace, a descent into a dark confusing reality. From the pit of life in the body, the virtual life looks like the virtuous life. Gibson evokes the Gnostic-Platonic-Manichean contempt for earthy, earthly existence.

Today's computer communication cuts the physical face out of the communication process. Computers stick the windows of the soul behind monitors, headsets, and datasuits. Even video conferencing adds only a simulation of face-to-face meeting, only a representation or an appearance of real meeting. The living, nonrepresentable face is the primal source of responsibility, the direct, warm link between private bodies. Without directly meeting others physically, our ethics languishes. Face-to-face communication, the fleshly bond between people, supports a longterm warmth and loyalty, a sense of obligation for which the computer-mediated communities have not yet been tested. Computer networks offer a certain sense of belonging, to be sure, but the sense of belonging circulates primarily among a special group of pioneers. How long and how deep are the personal relationships that develop outside embodied presence ? The face is the primal interface, more basic than any machine mediation. The physical eyes are the windows that establish the neighborhood of trust. Without the direct experience of the human face, ethical awareness shrinks and rudeness enters. Examples abound. John Coates, spokesperson for the WELL in northern California says : "Some people just lose good manners on line. You can really feel insulated and protected from people if you're not looking at them -- nobody can take a swing at you. On occasion, we've stepped in to request more diplomacy. One time we had to ask someone to go away" (7).

At the far end of distrust lies computer crime. The machine interface may amplify an amoral indifference to human relationships. Computers often eliminate the need to respond directly to what takes place between humans. People do not just observe one another, but become "lurkers". Without direct human presence, participation becomes optional. Electronic life converts primary bodily presence into telepresence, introducing a remove between represented presences. True, in bodily life we often play at altering our identity with different clothing, masks, and nicknames, but electronics installs the illusion that we are "having it both ways", keeping our distance while "putting ourselves on the line". On-line existence is intrinsically ambiguous, like the purchased passion of the customers in the House of Blue Lights in Gibson's *Burning Chrome* : "The customers are torn between needing someone and wanting to be alone at the same time, which has probably always been the name of that particular game, even before we had the neuroelectronics to enable them to have it both ways" (8). As the expanding global network permits the passage of bodily representations, "having it both ways" may reduce trust and spread cynical anomie.

A loss of innocence therefore accompanies an expanding network. As the on-line culture grows geographically, the sense of community diminishes. Shareware worked well in the early days of computers, and so did open bulletin boards. When the size of the user base increased, however, the spirit of community diminished, and the villains began appearing, some introducing viruses. Hackers invisibly reformatted hard disks, and shareware software writers moved to the commercial world. When we speak of a global village, we should keep in mind that every village makes villains, and when civilization reaches a certain degree of density, the barbaric tribes return, from within. Tribes shun their independent thinkers and punish individuality. A global international village, fed by accelerated competition and driven by information, may be host to an unprecedented barbarism. Gibson's vision of cyberspace works like a mental aphrodisiac, but it turns the living environment -- electronic and real -- into a harsh, nightmarish jungle. This jungle is more than a mere cyberpunk affectation, a matter of aestheticizing grit or conflict or rejection. It may also be an accurate vision of the intrinsic energies released in a cyberized society.

An artificial information jungle already spreads out over the world, duplicating with its virtual vastness the scattered geography of the actual world. The matrix already multiplies confusion, and future cyberspace may not simply reproduce a more efficient version of traditional information. The new information networks

resemble the modern megalopolis, often described as a concrete jungle (New York) or a sprawl (Los Angeles). A maze of activities and hidden byways snakes around with no apparent center. Architecturally, the network sprawl suggests the absence of a philosophical or religious absolute. Traditional publishing resembles a medieval European city, with the center of all activity, the cathedral or church spire, guiding and gathering all the communal directions and pathways. The steeple visibly radiates like a hub, drawing the inhabitants into a unity and measuring the other buildings on a central model. Traditionally, the long-involved process of choosing which texts to print or which movies or television shows to produce serves a similar function. The book industry, for instance, provides readers with various cues for evaluating information. The publishers legitimize printed information by giving clues that affect the reader's willingness to engage in reading the book. Editorial attention, packaging endorsements by professionals or colleagues, book design, and materials all add to the value of the publisher's imprint. Communication in contemporary cyberspace lacks the formal clues. In their place are private recommendations or just blind luck. The electronic world, unlike the traditional book industry, does not protect its readers or travelers by following rules that set up certain expectations. Already, in the electric element, the need for stable channels of content and reliable processes of choice grows urgent.

If cyberspace unfolds like existing large-scale media, we might expect a debasement of discriminating attention. If the economics of marketing forces the matrix to hold the attention of a critical mass of the population, we might expect a flashy liveliness and a flimsy currency to replace depth of content. Sustained attention will give way to fast-paced cuts. One British humanist spoke of the HISTORY forum on Bitnet in the following terms : "The HISTORY network has no view of what it exists for, and of late has become a sort of bar-room courthouse for pseudo-historical discussion on a range of currently topical events. It really is, as Glasgow soccer players are often called, a waste of space". Cyberspace without carefully laid channels of choice may become a waste of space.

The Underlying Fault

Finally, on-line freedom seems paradoxical. If the drive to construct cyber entities comes from Eros in the Platonic sense, and if the structure of cyberspace follows the model of Leibniz's computer God, then cyberspace rests dangerously on an underlying fault of paradox. Remove the hidden recesses, the lure of the unknown, and you also destroy the erotic urge to uncover and reach further; you destroy the source of yearning. Set up a synthetic reality, place yourself in a computer-simulated environment, and you undermine the human craving to penetrate what radically eludes you, what is novel and unpredictable. The computer God's-eye view robs you of your freedom to be fully human. Knowing that the computer God already knows every nook and cranny deprives you of your freedom to search and discover.

Even though the computer God's eye view remains closed to the human agents in cyberspace, they will know that such a view exists. Computerized reality synthesizes everything through calculation, and nothing exists in the synthetic world that is not literally numbered and counted. Here Gibson's protagonist gets a brief glimpse of this superhuman, or inhuman, omniscience :

Case's consciousness divided like beads of mercury, arcing above an endless beach the color of the dark silver clouds. His vision was spherical, as though a single retina lined the inner surface of a globe that contained all things, if all things could be counted.

And here things could be counted, each one. He knew the number of grains of sand in the construct of the beach (a number coded in a mathematical system that existed nowhere outside the mind that

was Neuromancer). He knew the number of yellow food packets in the canisters in the bunker (four hundred and seven). He knew the number of brass teeth in the left half of the open zipper of the saltcrusted leather jacket that Linda Lee wore as she trudged along the sunset beach, swinging a stick of driftwood in her hand (two hundred and two). (9)

The erotic lover reels under the burden of omniscience : "*If* all things could be counted...". Can the beloved remain the beloved when she is fully known, when she is fully exposed to the analysis and synthesis of binary construction ? Can we be touched or surprised -- deeply astonished -- by a synthetic reality, or will it always remain a magic trick, an illusory prestidigitation ?

With the thrill of free access to unlimited corridors of information comes the complementary threat of total organization. Beneath the artificial harmony lies the possibility of surveillance by the all-knowing Central System Monad. The absolute sysop wields invisible power over all members of the network. The infinite CSM holds the key for monitoring, censoring, or rerouting any piece of information or any phenomenal presence on the network. The integrative nature of the computer shows up today in the ability of the CSM to read, delete, or alter private e-mail on any computer-mediated system. Those who hold the keys to the system, technically and economically, have access to anything on the system. The CSM will most likely place a top priority on maintaining and securing its power. While matrix users feel geographical and intellectual distances melt away, the price they pay is their ability to initiate uncontrolled and unsupervised activity.

According to Leibniz's monadology, the physical space perceived by the monads comes as an inessential by-product of experience. Spatiotemporal experience goes back to the limitations of the fuzzy finite monad minds, their inability to grasp the true roots of their existence. From the perspective of eternity, the monads exist by rational law and make no unprescribed movements. Whatever movement or change they make disappears in the lightning speed of God's absolute cognition. The flesh, Leibniz maintained, introduces a cognitive fuzziness. For the Platonic imagination, this fuzzy incarnate world dims the light of intelligence.

Yet the erotic ontology of cyberspace contradicts this preference for disembodied intelligibility. If I am right about the erotic basis of cyberspace, then the surrogate body undoes its genesis, contradicts its nature. The ideal of the simultaneous all-at-once-ness of computerized information access undermines any world that is worth knowing. The fleshly world is worth knowing for its distances and its hidden horizons. Thankfully, the Central System Monad never gets beyond the terminals into the physical richness of this world. Fortunately, here in the broader world, we still need eyes, fingers, mice, modems, and phone lines.

Gibson leaves us the image of a human group that instinctively keeps its distance from the computer matrix. These are the Zionites, the religiously tribal folk who prefer music to computers and intuitive loyalties to calculation. The Zionites constitute a human remnant in the environmental desolation of *Neuromancer* :

Case didn't understand the Zionites.

... The Zionites always touched you when they were talking, hands on your shoulder. He [Case] didn't like that...

"Try it", Case said [holding out the electrodes of the cyberspace deck].

[The Zionite Aerol] took the band, put it on, and Case adjusted the trodes. He closed his eyes. Case hit the power stud. Aerol shuddered. Case jacked him back out. "What did you see, man ?"

"Babylon", Aerol said, sadly, handing him the trodes and kicking off down the corridors. (10)

As we suit up for the exciting future in cyberspace, we must not lose touch with the Zionites, the body people who remain rooted in the energies of the earth. They will nudge us out of our heady reverie in this new layer of

reality. They will remind us of the living genesis of cyberspace, of the heartbeat behind the laboratory, of the love that still sprouts amid the broken slag and the rusty shells of oil refineries "under the poisoned silver sky".

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