TechGnosis

Myth, Magic & Mysticism in the Age of Information

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New foreword by Eugene Thacker,
author of *In the Dust of This Planet*

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cyberspace: the virtual craft

Like Trojan horses, buzzwords carry their own secret contents, hidden histories and meanings that many of their users hardly suspect. Most of us first heard the term *virtual reality* in the beginning of the 1990s, when a large and very clever dread-locked gearhead named Jaron Lanier started showing off various goggles and gloves capable of launching the mind into three-dimensional worlds made of computer graphics. Hitting the mass brainstem like a rush of crack, the term rapidly took on the millennialist charge of all pop futurisms. Though the hype died down when the technology failed to deliver digital dreamtime, virtual reality remains a fundamental raison d'être of computer culture, a holy grail that keeps beckoning through the forest of tangled protocols and clunky hardware.

But *virtual reality* was not hatched in the hopped-up halls of Silicon Valley. Back in 1938, the French playwright, film actor, and state-declared madman Antonin Artaud dropped the phrase in one of the blazing manifestos collected in his magnum opus, *The Theater and Its Double*. Discussing the "mysterious identity of essence between alchemy and the theater," Artaud argued that the theater creates a virtual reality—- *"la réalité virtuelle"*-—in which characters, objects, and images take on the phantasmagoric force of alchemy's visionary internal dramas. For Artaud, theater is no more about representing ordinary life than

alchemy is about the chemical transmutation of lead into gold. Instead, both of these symbolic rituals should catalyze the same psychological states once produced in the "archetypal, primitive theater" of the Eleusinian Mysteries and the shamanic Orphic cults of ancient Greece. Artaud argued that, at their essential core, these ancient ritual spectacles evoked "the passionate and decisive transfusion of matter by mind"—the ultimate gnostic transmutation of reality that alchemists symbolized with the fabled philosopher's stone.

Artaud wrote that the image of this spiritualized state of matter beckons to us from "the incandescent edges of the future," and that it is this brass ring that powerful art and theater are constantly striving to hook. But today it is technology that restlessly plunges toward the incandescent edge of the future. As we'll see in this chapter, the techgnostic drive does not aim solely for the disembodied cognitive augmentation of the Extropians; it also sets its sights on a more hermetic world of magical iconography, mythic masks, and otherworldly journeys. The VR gear trumpeted by Lanier provided one snapshot of such an alchemical realm, but the astral plane of technoculture had already made its appearance in, of all places, a science-fiction novel.

Written on a Hermes 2000 manual typewriter and published in the prophetic year of 1984, William Gibson's *Neuromancer* hit the cultural cortex around the same time that personal computers invaded the home, and world financial markets launched into twenty-four-hour orbit. Though both Hollywood and recent history have made Gibson's dystopian vision of gritty data-hustlers, cutthroat corporations, and pervasive brand names as clichéd as the trench coats and femmes fatales of the *noir* thrillers that Gibson drew from, the novel's continued relevance (and resonance) can be boiled down to one single, religiously cited image:

> Cyberspace. A consensual hallucination. ... A graphic representation of data abstracted from the banks of every computer in the human system. . . . Lines of light ranged in the non space of the mind.[155]

Like all great mythic images, cyberspace suggested more than it explained, and while it concealed ironies its many enthusiasts would miss, it also provided a conceptual handle for the emerging hyperspace of digital communication. By hinting that the "unthinkable complexity" of the world's networks and databases could be tamed by an interactive three-dimensional map you could "jack into" through a video game deck, Gibson's vision struck a deep chord, crystallizing the inchoate desires of everyone from hackers to journalists to psychedelic bohemians. By the end of the 1980s, cyberspace had become a cultural attractor, sucking an increasingly computerized society forward with the relentless force of a *Star Wars* tractor beam.

For megatrend watchers and hype masters, cyberspace came to serve as a shorthand for a variety of very different developments—virtual reality, computer games, the rapid growth of Internet traffic, and the electronic etherealization of commerce across the globe. John Perry Barlow simply defined cyberspace as the place where you are when you're on the phone. But for others, *Neuromancers* "consensual hallucination" appeared to be something much more. In her book *The Pearly Gates of Cyberspace,* the science writer Margaret Wertheim argues that by creating a space that follows the virtual laws of thought rather than the concrete laws of matter, cyberspace provides a cosmos where the psyche can once again live and breathe. "Strange though it may seem for a quintessentially twentieth-century technology, cyberspace brings the historical wheel full circle and returns us to an almost medieval position, to a two-tiered reality in which psyche and soma each have their own space of action."[156] Like novels or cinema or comic books, cyberspace gives us a place to suspend the usual scientific rules that constrain the physical reality where our bodies live. But unlike these media, cyberspace is a shared interactive environment, an electronic "soul-space" that beckons the postmodern psyche to both find and remake itself.

Many people working inside the computer industry recognized the possibilities of technological soul-space as well, including a particularly energetic computer geek named Mark

Pesce. In the early 1990s, Pesce concluded that the best way to build real cyberspace was to "perceptualize the Internet." So over the next few years, he and a few cronies cooked up VRML, a "virtual reality mark-up language" that would add a graphic third dimension to the World Wide Web's tangled two-dimensional hypertext of pages, links, and endless URLs. For Pesce, as well as the legion of enthusiastic techheads infected by his charismatic trade show evangelism, VRML became the key to transforming the Web into a *world,* or rather a universe of worlds, each capable of nesting information within a kind of virtual theater: downtown Boston, a mock-up of Stonehenge, a blasted moonscape littered with Day-Glo monoliths.

Mark Pesce is also a technopagan, a goddess-worshiper, ritual magician, and occasional partaker of psychedelic sacraments. VRML was not just his day job, but a vital dimension of his occult work. As Pesce said in a 1994 interview with the author:

> Both cyberspace and magical space are purely manifest in the imagination. Both spaces are entirely constructed by your thoughts and beliefs. Korzybski says that the map is not the territory. Well, in magic, the map *is* the territory. And the same thing is true in cyberspace. There's nothing in that space you didn't bring in.

For Pesce, you don't need to anthropomorphize computers to give them a spiritual dimension. Computers can be sacred simply because human beings are sacred. Spiritual reality does not descend from on high; it is something we discover and make for ourselves, through our symbols and rituals and communicative interaction. Because cyberspace embodies and extends our symbol-making minds, it can mediate these sacred communications with each other, as well as "with the entities—the divine parts of ourselves—that we invoke in that space."

Loopy speculations about virtual reality and cyberspace are cocktail party chatter for West Coast cyberculture, but Pesce is the sort to put his notions into ritual practice. He and an ad hoc crew

of sysops and programmers decided to give VRML a magical send-off with CyberSamhain, a technopagan ritual held in San Francisco just as the Internet was beginning to explode in the mass mind. In general, Pagan ceremonies set the stage by establishing a ritual circle through a combination of performance and creative visualization. At once laboratory and temple, these circles stand "between the worlds," carving out room for magic and the gods in the midst of mundane space-time. After casting the circle, Pagans usually invoke the powers that animate the four elements of ancient lore: earth, air, water, and fire. Often symbolized by colored candles or statues, these four "Watchtowers" are imagined to stand like sentinels in the cardinal directions of the circle. For CyberSamhain, the Watchtowers were symbolized by four 486 PCs networked through an Ethernet and linked to a SPARC station hooked to the Internet. Each monitor screen became a window into a three-dimensional ritual space, a VRML world whose pentagrams and colored polyhedrons mirrored the actual room's magic circle. The astral plane had been reconfigured in cyberspace.

Needless to say, CyberSamhain baffled many of the multimedia mavens and Silicon Valley operatives who had been invited to the rite. But Pesce's desire to enchant cyberspace with images was prompted by more than obscure technopagan dreams, and these practical considerations attempted to address a problem that besets everyone attempting to manage the information glut of the online world. Pesce figured that as the World Wide Web continued to explode (or, perhaps more accurately, implode), the Web's array of search engines, domain names, and haphazard links would reach a point of chaotic breakdown. By using VRML to create virtual environments that could organize online data, Pesce hoped to enable humans to exploit the spatial navigation skills they had honed over hundreds of thousands of years. In *Mona Lisa Overdrive,* Gibson had already suggested the organizational power of cyberspace's visual map:

Put the trodes on and they were out there, all the data in the

> world stacked up like one big neon city, so that you could cruise around and have a kind of grip on it, visually anyway, because if you didn't, it was too complicated, trying to find your way to a particular piece of data you needed.[157]

Pesce was not alone in his intuition that Gibson's cyberspace fiction concealed a deeper truth about the potential power of visualizing and mapping digital data. In *The Axemaker's Gift,* a study of the entwined history of technology and consciousness, James Burke and Robert Ornstein argue that, from the very beginnings of human culture, "axemakers" have produced technologies that put selection pressures on the human brain, pressures that encouraged our minds to develop logical and analytic procedures that gradually alienated us from the matrix of nature. Acknowledging the devastating social and ecological costs of this great divide, the authors wind up their study arguing that the computer—the ultimate ax—may actually "take us back to what we were, mentally, before the axemaker's first gift changed the way our minds got developed and selected."[158] They hope that the icons, associative links, virtual spaces, and parallel processing of multimedia computing may resurrect the "arational thinking" of earlier days, a mode of consciousness based on intuition, imaginative leaps, and fuzzy rules-of-hand. "When much of the routine drudge-work of the mind is automated, the spatial, intuitive, 'navigational' talents may well be much better adapted to accessing knowledge that is structured more like the natural world rather than being reduced to alphanumeric codes."[159]

Given its anarchic and constantly mutating complexity, the Internet lends itself to such cartographic desire about as easily as the Everglades or the traffic flows of downtown Tokyo. But considering the intuitive handiness of three-dimensional images, it's a good bet that Internet developers (and the marketeers salivating over their shoulders) will not cease their labors until people can slip into polygon costumes and cruise through some portion of data space the way we now stroll through a theme park, bookstore, or mall. In fact, many of the worlds we'll have the

opportunity to jack into will more than likely resemble some unholy combination of theme park, bookstore, and mall. The banal fate of our culture may be to simulate the astral realms inside our machines, and then blanket them with Planet Hollywoods, Donkey Kong miniature-golf courses, and Lexis-Nexis fast-food data franchises.

Mark Pesce, Jaron Lanier, and other cyberhumanists share the hope that there will be room in this world for people to discover their own potential for creative magic, for socially improvising the language of soul. After all, if the Net does indeed unfold into a honeycomb of pop-up worlds, online exploration may encourage mythic thinking just by its very nature. We may become more and more like Gibson's cyberspace-jockey Case, who the science-fiction writer Norman Spinrad describes as a

> magician whose wizardry consists of directly interfacing . . . with . . . the computersphere, manipulating it imagistically (and being manipulated by it) much as more traditional shamans interact imagistically with more traditional mythic realms via drugs or trance states.[160]

Though we can't deny the enormous differences between our data-surfmg selves and our premodern forebears, we shouldn't write off the archaic and occult metaphors that cluster around new technologies as being totally inconsequential to digital experience. If multimedia and networked computers are indeed inculcating the "arational" thinking that Burke and Ornstein describe, then such metaphors, lifted from folklore or science-fiction novels, are actually helping to map the infosphere. Such online mythologies will never dominate our view of cyberspace, of course, but they will never disappear either. The digital world that lies before us is a hybrid one, a crossroads of codes and masks, algorithms and archetypes, science and simulacra.

The explosive mythology of cyberspace is also a symptom of the digital animism that is creeping into the technocultural border zones of the scientific paradigm. As we discussed at the end of the last chapter, various bots, spiders, and intelligent agents

already inhabit the Internet, and these programs will more than likely be increasingly perceived, in the popular imagination as well as the scientific fringe, as autonomous entities. This move toward digital life inevitably registers on the mythic plane. Discussing the angels, demons, and Bosch-like mutant morphs that animate so many video games and online computer worlds, Margaret Wertheim notes that "the population of soul-space is almost infinitely varied and mutable." That is, once the soul has made itself at home, that home inevitably fills up with fantastic critters. Wertheim compares today's digital populations to those that inhabit the colossal medieval soul-space found in Dante's *Commedia.* "From the dazzling six-winged 'thrones' who guard the set of God, to the six-bat-winged three-faced horror of Satan himself encased in ice at the center of hell, soul-space has always teemed with life on a cosmic scale."[161]

Gibson also recognized that the living fictions of the premodern imagination would inevitably populate the "vastness unutterable" of information space. As an old-time hacker in one of his novels admits:

> Yeah, there's things out there. Ghosts, voices. Why not? Oceans had mermaids, all that shit, and we had a sea of silicon, see? Sure, it's just a tailored hallucination we all agreed to have, cyberspace, but anybody who jacks in knows, fucking *knows,* it's a whole universe.[162]

While the dominant mystical images of cyberspace today stress its unity as a global electronic mind, Gibson cannily suggests that the dynamics of polytheism may be a more appropriate religious metaphor for the chaos of the new environment. At the end of *Neuromancer,* the artificial intelligence Wintermute achieves cybernetic godhead, but in *Count Zero,* the next novel in the series, we learn that this totalizing information entity fractured into various subroutines that somehow took on the behavior and personality of the gods, or *loa,* of Vodou—the Haitian spin on New World African religion. For Gibson, Vodou is not a figure of superstition but of technological savvy. *Count Zeros* Vodou priest

compares the religion's possession rites to "street tech," explaining that the *lods* "program" slots into the hardware of the human dancer—a nifty revision of the traditional Haitian metaphor of a horse and rider. As Gibson said in an interview, "The African religious impulse lends itself to a computer world much more than anything in the West. You cut deals with your favorite deity—it's like those religions already are dealing with artificial intelligences."[163]

By linking software programs and the gods who possess the dancing bodies of Vodou devotees, Gibson is not just playing cyberpunk games with Haitian religion. He's also suggesting something about the nature of the digital agents that may come to infest cyberspace. On a rational level, we will know that such computer programs are devoid of any animating substance; similarly, we might describe the *loa* as nothing more than culturally determined disassociative trance states catalyzed by Vodou's ritual technology. But as anyone who has attended a possession ritual can tell you, these entities quickly take on a life of their own. The skeptical question that we may find ourselves asking the AIs and software agents of the future—"How do I know if you are a sentient being and not just a simulation?"—could similarly be addressed to Vodou's wise and mischievous entities. And the answer might very well be that it doesn't really matter; by the time you reach the point of asking, "they" are already loosed into your world.

In the New World, most African-based religions—Vodou, Cuban Santeria, Brazilian Candomble—-derive from the Yoruban religious culture that still thrives in present-day Nigeria. As Ed Morales writes in the *Village Voice,* "Yoruban religion is perhaps the most powerful aspect of African culture that survives, and actually thrives, in late-20th century postindustrial society."[164] One of the reasons behind this apparent paradox is that, for all its deeply spiritual import, the "African religious impulse" remains an eminently pragmatic practice thoroughly in tune with the push and pull of everyday life. In his novel, Gibson calls Vodou "a *street* religion"—a phrase that significantly echoes his most famous maxim: "the street finds its uses

for things." For Gibson, the twists and turns that new technologies will take can never be programmed in advance, because the more marginal, crafty, and subversive elements of society ("the street") will always appropriate and reconfigure machines in new and unexpected ways. With his fanciful if rather pulpy image of technological Vodou, Gibson suggests that religious forces also possess such an unpredictable and volatile power when faced with new technologies.

In seeking to give mythological heft to his polytheistic intuitions, Gibson was psychologically savvy in fictionalizing such a pragmatic and syncretic practice as Vodou, even if the bulk of Haitians are precisely the sorts of folks who look to be structurally banished from the emerging information society. But if the author had wanted to scrounge up a premodern image of cyberspace itself—that is, of an information space constructed from virtual phantasms and data architectures—he could have poked through the dusty attic of Western consciousness, where, after digging around a bit, he eventually would have come across a most curious and ancient psychic technology: the art of memory.

The Palaces of Data

Imagine arriving at your local shopping center. Park the car, slip in through the whooshing automatic doors, and start exploring the place, picturing the stores and escalators and displays of goodies as clearly and distinctly as possible. Then imagine that this structure you've carved out of mindstuff is actually a database. Stick a mental Post-it note on the most striking objects you pass, associating each thing—a purple pair of Reeboks, a popcorn maker, a Tickle-Me Elmo doll—with some bit of pertinent minutia. Perhaps you organize your data by venue: business contacts at Brooks Brothers, mental snapshots of your travels in the multiethnic food court, lovers' birthdays and phone numbers in Victoria's Secret. But in any case, you should inscribe this virtual mall in your imagination so vividly that you can move through it as surely as you

pad around your own home. And by mentally "clicking" on each storefront and commodity, you can also recover the information you stored there.

This, in a cheap American nutshell, is the *ars memoria:* the ancient mnemonic technique of building architectural databases inside your skull. A few Roman writers gave compelling technical descriptions of these "memory palaces," considering them a vital and practical aspect of the art of rhetoric (the rhetorical term *topic* derives from *topoi,* the "place" where one might lodge an argument or idea). Memory palaces could be based on real spaces or imaginary ones; some believed the best palaces combined the two modes, so that simulations of actual buildings were infused with impossible properties. Though it's tough to believe this rather baroque system worked very well, the prodigious memories of the classical world suggest otherwise. Seneca, we are told, could hear a list of two thousand names and spit them back in order, while Simplicius, a buddy of Augustine, got a kick out of reciting Virgil's *Aeneid* off the top of his head—backward.

We are as chipmunks to these mighty elephants of recall. Having externalized our memories, we squirrel facts away in written texts, hard discs, and Palm Pilots rather than swallow them whole. And yet with the immense honeycomb of cyberspace—the supreme amputation of memory—we spiral around again to the experience of memory as a *space of information,* a three-dimensional realm that's "outside" ourselves while simultaneously tucked "inside" an exploratory space that resembles the mind. From this perspective, Saint Augustine's paean to memory in the *Confessions* suggests not only the realms of the artificial memory but also the evanescent grids of cyberspace: "Behold the plains, and caves, and caverns of my memory, innumerable and innumerably full of innumerable kinds of things." Augustine calls this an "inner place, which is as yet no place," piled high with images, information, emotions, and experiences. "Over all these do I run, I fly," he writes, sounding like one of Gibson's console cowboys. "I dive on this side and that, as far as I can, and there is no end."[165]

The closest that today's online spelunkers come to these endless associational flights of recall is surfing the World Wide Web—a technology that was invented because of an irritating quirk of one man's memory. As a visiting scholar at CERN, Tim Berners-Lee had to master the European physics laboratory's labyrinthine information system, but he wasn't particularly hot at recalling what he terms "random connections." So he whipped up a personal memory substitute called Enquire, basically a hypertext system that allowed him to drop words into documents that acted as specific links to other documents. To share the system with other researchers on the network, Berners-Lee cranked out and distributed the expanded protocols for what he came to call the World Wide Web. The rest, as they say, is history. In a 1997 *Time* interview that took place at MIT's computer science lab, Berners-Lee describes the intuitive, neural structure of the Web's hypertext by referring to his cup of coffee. "If instead of coffee I'd brought in lilac," he says to the interviewer, "you'd have a strong association between the laboratory for computer science and lilac. You could walk by a lilac bush and be brought back to the laboratory."[166] The icons and hyperlinks of the Web thus simulate the associational habits of memory, habits that lend the imagination its intuitive capacity for leaps and analogies.

This is not to say that Augustine would confuse a few hours of Web grazing with the rich and penetrating introspection that he believed brought one closer to God. On the other hand, if he *had* been an adept of the *an memoria,* he would also have regarded the art as a perfectly pragmatic intellectual tool, a *techne* that transforms the imagination into a psychic file cabinet as functional as any desktop metaphor. In fact, the orator Cicero's technical specs for memory palaces seem almost tailor-made for Java jockeys toiling over corporate Web sites:

> One must employ a large number of places which must be well-lighted, clearly set out in order, at moderate intervals apart; and images which are active, sharply defined, unusual, and which have the power of speedily encountering and penetrating the psyche.[167]

Using the media metaphors of his day, Cicero wrote that "we shall employ the places and images respectively as a wax writing-tablet and the letters written on it."[168] For Cicero, these "images," or *simulacra*, functioned similarly to the icons of todays Web—compressed graphics that open up a store of data and that supplement, without replacing, the more abstract inscriptions of text. Though simple icons like anchors and swords were apparently employed, the anonymous author of *Ad Herennium* insisted that the mnemonic emblems must be "active" and "striking"—gorgeous or ugly as hell, fantastically garbed or dripping with blood.

No wonder Aristotle warned his readers that memory palaces could leak into the dreams of their creators—adepts of the art were trafficking with the fierce phantasms of the unconscious. Though the classical rhetoricians seem to have deployed these simulacra for purely instrumental purposes, the *ars memoria* eventually took on a more spiritual and occult import. Medieval theologians employed the art to "remember heaven and hell," lodging the Church's innumerable array of vices and virtues within Byzantine psychic architectures, probably not unlike Dante's poetic maps of the afterworld. Though intellectual heavyweights like the Jesuits continued to use the mnemonic art well into the seventeenth century, modern thinkers stopped using such loosely associational networks in order to organize fields of knowledge—part and parcel of their wholesale rejection of the productions of the imagination.

As the historian Dame Frances Yates shows in her classic book *The Art of Memory,* the magical and mystical potentials of these premodern psychic architectures were thoroughly exploited by our old friends the Renaissance Hermeticists. Though magicians had an obvious attraction to creative internal imagery, a more religious reason for their embrace of the art lay in the eleventh treatise of the *Corpus Hermeticum.* In the text, the divine character known as Mind informs Hermes Trismegistus that

> you must think of god in this way, as having everything—the cosmos, himself, [the] universe—like thoughts within

himself. Thus, unless you make yourself equal to god, you cannot understand god.[1]®

For Renaissance intellectuals like Giulio Camillo, Giordano Bruno, and the later Robert Fludd, the implications were clear: The magus must build himself a divine and encyclopedic memory. As the historian Peter French explains, "by inscribing a representation of the universe within his own *mens* [higher mind], man can ascend and unite with God."[170] And what better technology of representation than the art of memory?

After all, your typical aspiring mage was already up to his eyeballs in data. Striving to grok the occult networks that bound together the World Soul, Hermeticists hoarded a stunning amount of information: angelic names, astrological deities, and numerological correspondences; ciphers, signs, and sigils; lists of herbs, metals, and incense. Renaissance tomes like Agrippa's *Three Books of Occult Philosophy* are as packed with charts and lists and instructions as any Macintosh Bible. When it came to spatially organizing this welter of material along the lines of the *ars memoria,* the Renaissance mages turned to the heavens themselves, or more specifically, to the astrological high-rise of Neoplatonic and medieval cosmology. This cosmic map became the macrocosmic "palace" that housed the microcosmic encyclopedia of the world, organized by various hieroglyphic icons that ruled different facets of human knowledge. Though hardly a rigorous taxonomy, this system of symbolic correspondences did possess a certain economy. Regarding such hermetic glyphs, Mark Pesce noted that "You can manipulate a whole bunch of things with one symbol, dragging in a whole idea space with one icon. It's like a nice compression algorithm." As such, the kabbalistic icons utilized by the mages of the *ars memoria* broke down the distinction between literal and figurative. Like the allegedly magical hieroglyphs of the ancient Egyptians, these mnemonic cues both signified and manifested the power they represented; by manipulating sigils and images associated with Venus or Mars, the magus was not just manipulating representations, but trafficking with the forces themselves. Similarly, the

icons of hypertext or the World Wide Web simultaneously function as symbols, inscriptions, and operational buttons; they are both a writing and a reality. As Jay David Bolter notes in *Writing Space*, "Electronic writing is more like hieroglyphs than it is like pure alphabetic writing."[171]

This may help explain why the esoteric domains of the World Wide Web are stuffed with sites devoted to Giulio Camillo, whose elaborate wooden memory theaters, encrusted with hermetic images and icons, became the talk of the town in the sixteenth century. But the most sophisticated Renaissance memory hacker was Giordano Bruno, best known for ending his days as Vatican kindling, a "martyr to science" whose heretical advocacy of Copernicanism was actually motivated by his enthusiasm for pagan sun worship. Believing that the astral forces that govern the outer world also operate within, and can be reproduced there to operate "a magico-mechanical memory," Bruno created data-dense memory charts based on a complex Egyptian iconography of star-beings. These fantastic daemons, who should not be confused with Christian demons, were not only "active" and "striking" mnemonic icons, but also living spiritual entities—the intelligent agents of Bruno's universe of knowledge. Bruno also introduced movement into his system through the use of revolving gears of abstract symbols superficially similar to diagrams of symbolic logic. These secret decoder rings derived from the *ars combinatoria* of the thirteenth-century Catalan mystic Ramon Lull, who believed that his logical wheels could automatically demonstrate the divine attributes of God.

It's hardly surprising that Dame Yates, writing in the 1960s, saw a "curiously close" link between Bruno's magico-mechanical memory systems—with their "appalling complexity"—and the "mind machines" discussed in the press, and the German philosopher Werner Kiinzel eventually translated Lull's art into the computer language COBOL. For Bolter, the connection between the scientist and the Renaissance magus makes sense, for both operators "share the feeling that memory is the key to human knowledge and therefore to human control of the

world."[172] Bolter points out that the memory devices of Bruno and others not only reflected the world of sense perceptions but also the "true" metaphysical structure of the cosmos; moreover, the manipulation of this hidden structure would itself open up all the realms of humanly accessible knowledge. So too, Bolter argues, does the computer specialist believe that his computer reflects the true logical structure of the universe, a structure of information that also provides for ultimate control.

So while the technical specs and blueprints of the *ars memoria* dimly anticipate the possible architectures of cyberspace, they even more profoundly reflect the desire we share with the Renaissance Hermeticists: to know the world and its information by capturing it in a virtual representation we can manipulate. The Renaissance might even be defined as a revolution in *point of view:* the discovery of the compass, the invention of perspective drawing, the leap forward in the science of mapmaking, and the mass production of printed images. But these technical developments only indicate a deeper mutation in the human subject: the Renaissance man whose eyes roved far and wide, who explored and mastered what he saw, and whose maps and gadgets helped him dominate the material spaces of the earth. Even if the Internet never achieves any sort of cartographic coherence, it and the myriad offline databases exploiting new visualization tools remain driven by the Hermeticists desire to master an associational field of icons and data, a mnemonic space where "information is power" and a planet's worth of knowledge is only a click away.

In the Similitude of a Dream

Given all the news feeds, sports stats, and fart jokes available on the Internet, all this talk of wizards and memory palaces may seem a trifle dramatic. But chimeras do inhabit digital space, and to get a good glimpse of them, all you have to do is stroll down to your local software shop. Ignore all the "useful" programs, with their sharp, confident packages and dull, workaday spells of increased intelligence and efficiency. Head for the racks

where salivating hellhounds, deep-space cruisers, and legions of marauding ores hold sway. Head for the computer games.

In many ways, games are to digital technology what porno videos were to the VCR: the "killer app" (or application) that, by stimulating gargantuan desires, creates a mass consumer market for a new media technology. Arcade playstations and Sega/Nintendo/3DO decks suck armies of children into computer codespace for the first time in their lives, providing escapist pleasures and modes of self-definition that comic books and TV shows cannot hope to beat. At the same time, parents fritter away the night running PC games on machines purchased, they would most likely say, for far more sensible purposes. All told, digital games are a billion-dollar industry whose hit products have the capacity to literally addict their users.

Why make some digital games so compulsive? However demanding the strategic challenges of such games are, the pleasures of higher cortical function alone cannot account for their addictive power. In fact, some of the most popular games seem to reach right down to the lizard brain, catalyzing an intense fixation physiologically comparable to a trance state. The Texans behind the phenomenally successful and exuberantly bloody shooting games Doom and Quake were definitely on the right track when they named their company Id—the most primitive character in the Freudian triumvirate of id, ego, and superego. The id is the monstrous unconscious tyke that the good doctor believed our egos must constantly wrestle with in order for civilization to stand. Freud argued that we can never experience the id directly (nor would we want to). But we can track its muddy footprints through slips of the tongue, neurotic compulsions, and dreams, which Freud saw as internal dramas that simultaneously fulfilled and masked the inchoate drives of the unconscious.

The concept of the id has increasingly come under attack, but it continues to inspire the digital entertainment industry. "Psychologists say inside every 18- to 35-year-old male, there lies a potential psychotic killer," states an ad for the Philips games Nihilist and Battle Slayer. "Can he come out to play?"

Though computer games are not dreams in any real sense, many a game is both constructed and consumed as what *The Pilgrims Progress* author John Bunyan might call a "similitude of a dream." Like fantasy literature or visionary art, a good number of games seek to meet the logic of dreams halfway, to attach their surreal images, stark terrors, and otherworldly air of possibility onto compelling narratives or, at the very least, compulsive goals. Sega's 1996 Nights makes a racing game out of the archetypal dream experience of flying, while The Dark Eye exploits the morbid hypnagogic tales of Edgar Allan Poe. The CD-ROM game Myst achieved blockbuster status not because of its somewhat dorky puzzles, but because of its haunting dreamworld imagery of deserted islands, magical books, and baroque machines. It's no wonder that hard-core gamers often report that their screen obsessions seep into REM sleep.

Through networked gameplay, more people are able to share the same simulated dreamscapes at the same time. Multiplayer versions of popular games like Jedi Knight and Ultima Online have colonized the Internet, while companies like Battletech attract kids to theme-park-style centers where teams of players, each encased in individual cockpit pods, attempt to kill each other inside a shared virtual world. The "Freudian" interpretation of computer games as an escape valve for the antisocial id cannot really encompass this suddenly *social* imaginary world (though it certainly helps explain the actions of some of its participants, who can now come one step closer to killing "real" people). Perhaps it's better to take a lesson from the mystics and esoteric psychologists of the ages, for whom the id was not a narcissistic cul-de-sac but a treacherous gateway into the collective planes of the inner worlds. Following the path laid down by earlier Magellans of the mind, Carl Jung described an archetypal world of images and godforms that he believed drew its sap from the most ancient roots of the human mind. Jung named this twilight zone the collective unconscious, though a more evocative and satisfying term was offered up by the Sufi scholar Henry Corbin, who spoke of the *mundus imaginalis*, or imaginal world.

Perhaps what we are building in the name of escapist entertainment are the shared symbols and archetypal landscapes of a tawdry technological *mundus imaginalis*. The evil creatures who must be conquered to advance levels are the faint echoes of the threshold-dwellers and Keepers of the Gates that shamans and Gnostics had to conquer in their mystic peregrinations of the other worlds. Though it's dangerous to add another drop of hype to an industry that rivals Hollywood for commercial crassness and creative sloth, the game designer Brian Moriarty may not have been entirely fatuous when he told a 1996 Computer Game Developers' Conference that "spiritual experiences are, in fact, our business."[173] For all the kick-fighters, F-l6s, and football gridirons you find, anyone can see that the digital imaginary is chock-full of images drawn from the depths of myth, cult, and popular religion. This mythopoetic current runs through the Orientalist backdrops of Mortal Kombat, the cartoon animism of kids' software, and the spider demons of Doom. Though most such imagery is juvenile and crude, "mature" works of multimedia also feed on this fantastic stew: Cosmology of Kyoto sets bodhisattvas and folkloric monsters loose inside the cartoon walls of the twelfth-century Japanese capital; Amber explores your past lives; while in Drowned God you uncover the "conspiracy of the ages" by exploring Atlantis, the Bermuda Triangle, and Roswell, New Mexico.

Of all the mythic cosmologies that have been retooled for the purposes of computer play, none can approach the hackneyed majesty of heroic fantasy, the neomedieval genre of strapping swordsmen, bearded wizards, gloating dragons, and D-cup princesses most pungently known as sword and sorcery. Achieving a kind of archetypal quality through the brute repetition of its own clichés alone, the genre has defined the imagery, landscapes, and violent conflicts of countless role-playing adventure games and online MUDs. It also informs the in-jokes, jargon, and even psychology of many computer hackers and hard-core Internet honchos (Katie Hafner and Matthew Lyon's history of the Net is called *Where Wizards Stay Up Late).* It's not too much to say that the phantasms

of the Dark Ages form the imaginary bedrock of cyberspace.

As such, sword and sorcery is just one more example of the neomedieval tapestries that hang in the halls of postmodern civilization. In his essay "Living in the New Middle Ages," Umberto Eco links this curious cultural resonance to a number of shared historical conditions—the rise of cultural tribalism, the insecurities that accompany a collapse of a Great Pax, and the "total lack of distinction between aesthetic objects and mechanical objects."[174] One could also add the increasingly feudal nature of an economy divided between the gated, privately patrolled citadels of the rich and the legions of men and women who strive for corporate peonage or the nomadic pickings of a "freelance" life. Eco also argues that both the medieval era and our own are dominated by the visual communication of images. Elites live in a world of texts and logic, while a less literate mass culture is immersed in a propagandistic sea of images distributed through universal—or "catholic"—communication nets. Eco compares the Gothic cathedral to a comic book in stone, its stained-glass windows to a TV screen flashing Christian advertisements. No doubt Eco would have been amused by a widely distributed 1994 Internet "press release" that announced that Microsoft had acquired the Catholic Church.

Of course, the "Middle Ages" of sword and sorcery has a lot more to do with pulp fiction than with ten centuries of European serfdom lodged between marauding Visigoths and the Black Death. But as Eco points out, the West has been fantasizing about the Middle Ages ever since we thrust ourselves out of its misty womb at the dawn of the Renaissance. In the sixteenth century, Spenser and Cervantes revisited the landscape of chivalry for their own (very different) literary ends; in the midst of the Age of Reason, Walpoles 1764 *Castle of Otranto* sparked the craze for gothic romance, a medievalist genre whose blanched melancholy, brooding spooks, and misty landscapes persist today in horror and science fiction. The Romantics constructed a number of different Middle Ages as bulwarks against the smoke and fury of industrialism, from the leafy odes of Keats and Shelley to the blood-pounding ring cycles of Richard

Wagner to the fantasy novels of the socialist reformer William Morris. At the same time, these fictions were also carrying on dialogues with real medieval literature, which was rife with the sorts of miraculous events and magical forces that presumably haunted medieval perception. Despite all their theological product placements, medieval tales often took place in a succulent paganish landscape inherited from Celtic literature, a phantasmagoric realm of spells and sprites and talking trees known at least from Spenser's time as Fairy.

In the twentieth century, the realm of Fairy persists in kids' books, bad movies, and the treacherous Forest of Pulp that makes up the market for contemporary fantasy fiction. And it is in this hackneyed wood that one finds the literary source of digital medievalism: Robert E. Howard, a hard-drinking Texan who spent the 1930s cranking out brutal and necromantic page-turners for pulp magazines like *Weird Tales*. By far his most famous and vivid yarns starred Conan of Cimmeria, a sword-wielding barbarian who lumbered through a cruel landscape of serpent queens and ruined temples. Though a case could be made for Edgar Rice Burroughs, Howard probably earns the credit—or blame—for the creation of sword and sorcery, and his juvenile spirit of bloodthirsty symbolic release lives on in countless computer games today. But Howard's visceral tales probably would have passed from popular memory were it not for the tremendously popular and vastly different work of J. R. R. Tolkien, a mild-mannered Oxford medievalist and staunch Roman Catholic whose *The Lord of the Rings* takes place inside one of the most completely realized worlds in the history of fantastic literature. Tolkien fleshed out his imaginary land of Middle-Earth with its own songs, folklore, and languages; a rigorous social ecology of elves, ents, humans, and hobbits; and an exquisitely crafted topography. Tolkien's work proved the point he himself made in his essay "On Fairy-stories." A great author of fantasy "makes a Secondary World which your mind can enter. Inside it, what he relates is true': it accords with the laws of that world. You therefore believe it, while you are, as it were, inside."[175]

Like designers of virtual worlds today, Tolkien knew that successful secondary worlds were not wild flights of fancy, but products of creative method and potent technology—what Tolkien described as an "elvish craft" capable of suspending the disbelief of "both designer and spectator." Tolkien described this art as a kind of magic, but a magic "at the furthest pole from the vulgar devices of the laborious, scientific, magician."[176] Like Jacques Ellul, Tolkien deplored the twentieth century's ugly and vaguely satanic technologies, and his fallen sorcerer Sauron, who forges the rings of power in the volcanic Mount Doom, can be read as a Promethean magus of technique. But though Tolkien had little taste for the modern world, the modern world loved him. *The Lord of the Rings* became a blockbuster hit in the 1960s, spurring a literary (and subliterary) boom in fantasy and science fiction—genres that were gobbled up by, among others, the creative computer geeks growing up in the shadows of the mainframe. Tolkien's imagery also saturated a counterculture that desperately wanted to bring its own magical perceptions to life. Some Berkeley-based science-fiction fans formed the Society for Creative Anachronism to theatrically re-create the Middle Ages, while religious misfits across the land began dabbling with the druid rituals and Celtic mythology that would later sprout into the American Pagan revival. *The Lord of the Rings* didn't j ust make you want to escape into another world; it made you want to build your own.

Allegorical Machines

Tolkien died in 1973, the same year that two Midwesterners named Gary Gygax and Dave Arneson forged the next link in the chain mail of the technopagan imaginary. Gygax and Arneson were ravenous fans of historically rigorous Avalon Hill strategy games like Gettysburg and Stalingrad, war games played with hexagonal field maps, miniature playing pieces, and byzantine rules meant to simulate the claustrophobic conditions of battle. For a lark, the duo decided to revamp a medieval combat game by introducing fantasy elements that owed as much to Conan the

Barbarian as to Frodo the hobbit. The resulting hybrid was the notorious Dungeons & Dragons, better known to its devotees as D&D.

One design feature of D&D would prove particularly important for later computer culture. Rather than control armies from above, participants chose to "play" individual characters created from a menu of races and player classes. You might doff the imaginary cap of a mace-wielding dwarf named Glorp, whose unique characteristics were defined by a statistically determined array of skills, spells, weapons, and traits. Banding together with other role-playing fellows, you and Glorp would explore a neomedieval world filled with underground labyrinths and catacombs. With no ultimate goal in mind, you and your merry crew would scavenge for treasure or magic scrolls, dodge traps, kill enemies, and avoid the death-dealing forces that could ax your character at any moment.

With their invention of the fantasy role-playing game (or RPG), Gygax and Arneson had not simply churned out another world in the Middle-Earth mold. They had built tools for other "subcreators" to use, tools capable of constructing otherworldly realms that transformed players into participants. As a category, the word *fantasy* certainly describes the dark, fairy-tale logic mined by D&D and the lion's share of RPGs that followed in its enormously successful wake. But D&D was also *phantasmic* in its very techniques, for the game "took place" not on a board but in the creative psyches of its players. No longer did combatants loom over strategic maps from the god's-eye view of opposing generals; now they wandered chartless inside a simulated mental world conjured by the godlike game lord and bard known as the Dungeon Master. Acting as oral demiurge, the DM led his players, room by room, through a unique world carved out of his own imagination and D&D's loose rules of composition.

To envision the Dungeon Master's secondary world, D&D players exploited the same powers of creative imagination used and misused by occultists past and present. Indeed, the tips given in the *Advanced Dungeons & Dragons Player's Handbook*

sound almost like instructions for a New Age visualization, or a B-movie form of the *ars memoria:*

> As [the Dungeon Master] describes your surroundings, try to picture them mentally. Close your eyes and construct the walls of the maze around yourself. Imagine the hobgoblin as [the DM] describes it whooping and gamboling down the corridor toward you. Now imagine how you would react in that situation and tell [the DM] what you are going to do.[177]

Though most simulation gamers were simply having a blast, many a Pagan was born during those long nights in the den swilling Coca-Cola and eviscerating trolls. Besides the occult arcana that stuff the handbooks of D&D and many RPGs, role-playing games operationally resemble magical rituals, which also take place within a bounded space and time ruled by the imaginative exploration of deeply mythological scenarios. This is not to say that gamers believe in their Secondary Worlds; instead, they *program* them, using an elaborate symbolic machinery in order to solidify and organize the plastic material of the imagination. For most RPGs, this machinery includes thick rule-books of lore, statistical tables, occasional maps, and a set of weirdly shaped dice that determine the outcome of various contests by forcing the hand of chance.

Tolkien would probably recoil at all this rigmarole, so far from the fairy stories he loved and so reminiscent of the "vulgar devices of the laborious, scientific, magician." But God only knows what the man would have thought of the DEC PDP-10 mainframe computer that would provide the next and arguably strangest operating system for Fairy. In the mid-1970s, a researcher named Don Woods was working at the Stanford Artificial Intelligence Lab—the kind of Californian think tank where the rooms were named after Middle-Earth locales and the printer was outfitted with three elven fonts. Woods came across a primitive text-only adventure game hacked together by Will Crowther, one of the bright guys behind early network computing. Expanding on Crowther's program, Don Woods

designed a knockoff of D&D called, variously, ADVENT, Adventure, or Colossal Cave. Unlike D&D combatants, Adventure players went solo into an underworld cartography described by screenfuls of computer text ("YOU ARE IN A MAZE OF TWISTY LITTLE PASSAGES, ALL ALIKE"). Typing simple commands ("GO NORTH," "TAKE WAND," "KILL DRAGON") prompted responses from the impish program ("KILL THE DRAGON WITH WHAT, YOUR BARE HANDS?") and gave you the chance to crack the elaborate puzzles that stood between you and the next treasure chest or underworld chamber. As Steven Levy noted, "Each 'room' of the adventure was like a computer subroutine, presenting a logical problem you'd have to solve."[178]

Besides laying down the basic framework for hundreds of future adventure games, Adventure showed how successfully a laborious and scientific device like the computer could suspend disbelief and simulate a magical world. The program's well-defined descriptions allowed you to project yourself into the simple prose the way you could dive into a pulpy SF novel, and its logical loops and algorithms brought the "symbolic machinery" of its Secondary World one step closer to natural law. As Julian Dibbell explains, "for anyone in the midst of exploring it, the world of Adventure was as hard-wired as gravity, and almost as convincing."[179] By transforming the PDP-10 into both dungeon and dungeon master, Crowther and Woods not only had established a particularly addictive mode of interacting with digital code, but had forged a new kind of imaginal space in the bowels of the computer.

With the blessings of its creators, pirate copies of the program rapidly circulated through various research communities linked through the ARPAnet, the ancestor of today's Internet. According to Dave Lebling, "All work ceased throughout almost the entire country at these research sites. It was almost like an infection."[180] Recognizing a potentially lucrative addiction when he saw one, Lebling later took Colossal Cave out of its open network environment and retooled it into Zork, a successful consumer product that helped kick-start the computer game industry. While

the vivid and engrossing graphics of todays games have pushed text-based adventures like Zork to the margins, the digital imagery of sword and sorcery continues to clang away in such popular fantasy computer games as Dragon Warrior, WarCraft II, War Hammer, and the Ultima series.

Because Adventure does not hide its writing space behind graphic images, the game provides a particularly clear framework for grasping the phantasmic logic that shapes digital space. With that in mind, I ask you to dwell for a moment on one of the most archaic and venerable images in the history of computer culture, which also happens to be the first scene that Adventure throws the errant players way:

> YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK BUILDING. AROUND YOU IS A FOREST. A SMALL STREAM FLOWS OUT OF THE BUILDING AND DOWN A GULLY.

At once schematic and concrete, these words conjure up the kind of internal landscape that you want to explore. But if we let the image sound the depths of literary memory, it takes us back to another traveler, stepping off of another road, about to begin another underworld quest:

> *When I had journeyed half our life's way,*
> *I found myself within a shadowed forest,*
> *for I had lost the path that does not stray.*[181]

And so does Dante begin his descent into the colossal caverns of the *Inferno,* the first third of his *Divine Comedy,* the great allegorical poem of the Middle Ages.

Though it's somewhat ridiculous to compare an Olympian work of imaginative poetry with a goofy computer game, the Dantesque link to digital space is compelling. For one thing, both the Inferno and Colossal Cave distincdy resemble the virtual data architectures of the *ars memoria. As* Crowther designed it, Colossal Cave actually fulfilled one of the classic

recommendations for the old memory palaces: Internalize the structure of an actual place (in this case, Kentucky's Bedquilt Cave), and then add magical elements and properties. Frances Yates suggests that Dante's *Divine Comedy* may well have been a product of the art of memory, arguing that the poet's intensely visual and nearly tactile journey through the structured layers of the afterworld fulfill the classical rule of "striking images on orders of places."[182]

As Dante strolls through his Neoplatonic Catholic cosmology, his movements tell an archetypal narrative about the virtual soul and its passage from sin to salvation. At the same time, the poem's images pack in a small encyclopedia of data: references to ancient mythology, Thomistic philosophy, autobiography, Italian poetry, the politics of Florence. The *Divine Comedy* is a poetic data space, something that the American poet laureate Robert Pinsky recognized in 1984, when he wrote an Adventure-style text-based computer game loosely modeled on the poem. More recently, the Digital Dante Project at Columbia University has begun "translating" Dante's text into a multimedia Web site that incorporates text, audio, video, and images into a nest of hyperlinks drawn from various commentaries. The Project picked the *Divine Comedy* to prototype their "twenty-first-century illumination" because "Dante the poet understood the power of images, the icons of a culture, and architectural spaces."[183]

As such, Dante was also a master of allegory, that literary and pictorial mode that, at one level, uses concrete images, characters, or landscapes to represent the abstract relationship between ideas, usually of a moral or religious nature. For example, the envious souls who expiate their sins on the second terrace of Mount Purgatory have their eyes sewn shut with wire; this bizarre surface detail corresponds to, and reverses, the moral fault of gazing beyond the self with envy. Allegories are thus a rather paradoxical way of explaining concepts with symbols. As the literary scholar Angus Fletcher points out, allegories often take place in fantastic, almost psychedelic environments—a dreamland, a visionary otherworld, or a futuristic scenario

where magic appears as superscience. At the same time, and unlike Dantes poetry, allegories are usually dry and schematic, as they tend to follow the abstract or logical relationships between concepts rather than the unique drives of characters or the turbulent power of raw images. John Bunyan's enormously popular Christian allegory *The Pilgrim's Progress* reads like a connect-the-dots catechism. In fact, some characters in allegorical texts are so programmatic that they were known in the trade as "allegorical machines."

In some ways, Adventure (and the coundess adventure games it spawned) sticks the user into a first-person allegory. Like Dante or the knights-errant in *The Faerie Queene,* whose environs Coleridge described as "mental space," you wander through a rigorously structured but dreamlike landscape patched together from phantasms. These images usually possess more than a surface meaning, since they conceal clues and abstract relationships that, if figured out, will send you deeper into gamespace. The characters you run into are also literally "machines"—programmed daemonic agents with whom you must struggle to make your way forward.

Of course, Adventure and its more barbaric descendants are hardly religious or even moral universes, though Lucas Arts's 1996 game After Life did ask players to manage souls in a Dantesque world of hell, purgatory, and heaven. But if the images in these games do not encode virtues and vices, then what do they allegorize? Steven Levy gives us a hint in *Hackers:* "In a sense, Adventure was a metaphor for computer programming itself—the deep recesses you explored in the Adventure world were akin to the basic, most obscure levels of the machine that you'd be traveling in when you hacked in assembly code."[184] Sherry Turkle, a psychologist at MIT, also explained that Adventure fans "found an affinity between the aesthetics of building a large complex program, with its treelike structure, its subprograms and sub-subprograms, and working one's way through a highly structured, constructed world of mazes and magic and secret, hidden rooms."[185] Adventure is not an allegorical machine; it's an allegory O/the machine.

Angus Fletcher defines allegory as "a fundamental process of encoding our speech," and computers are nothing if not hierarchies of encoded language.[186] At the bottom of this digital dungeon lie the physical circuits whose pulses of energy embody the basic binary code. Because the "machine language" that commands this code is hellish to hack, computer scientists long ago invented control jargons like assembly language and higher-order programming codes such as MS-DOS, UNIX, and C++. These latter tongues come relatively close to natural languages like English; a few well-placed words can command gobs of machine code. At the top level of this stack of lingo lies the sunlit world of the user interface, which in the case of Adventure was just a screen full of text and a simple parser that interpreted the actions that players typed in. The user interface is the level most of us noninitiates manipulate, often without a thought of the hairy briar patch lurking below.

In a sense, all user interfaces can be seen as interactive allegories of the computer. When Apple engineers introduced the Macintosh and its graphic user interface (GUI), they replaced the dry world of command lines and DOS prompts with a world of simple simulacra. The Mac cloaked the computer's workings inside an audiovisual "desktop metaphor" whose folders, trashcans, and icons served as active and intuitive representations of the computer's internal processes. These simulacra proved enormously popular among nontechnical people, and as computers and the Internet continue to saturate the world at large, we can expect user interfaces—including Internet browsers, Web sites, and program control panels—to plunge us ever deeper into such iconic simulations, and to pull us further from the binary codespace where the action "really" lies. Perhaps our tame digital metaphors will one day bloom into allegorical landscapes, and desktops, windows, and browsers will open into three-dimensional worlds animated with daemonic agents and interdimensional portals that conceal an underlying layer of purely logical protocols.

Whether or not we are talking about desktop terminals or

software packages or Net browsers, good interfaces mediate the hyperspace of information in ways familiar enough to keep us from getting lost but not so familiar that we remain rooted in the habits associated with other media or with the everyday world. Hypertext visionary Ted Nelson observed:

> Once we leave behind "two-dimensionality" (virtual paper) and even "three-dimensionality" (virtual stacks), we step off the edge into another world,, into the representation of the *true structure and interconnectedness of information.* To represent this true structure, we need to indicate multidimensional connection and multiple connections between entities.[187]

The notion that information possesses a "true structure" is a major motif in the metaphysics of information, but here Nelson asks a more basic question: How can one represent such a multidimensional world? Hoping to construct a vast and labyrinthine library of interlinked documents, Nelson pushed the envelope with the rather science-fiction notion of placing "wormholes" between documents, but the name of Nelson's project—Xanadu—and the fact that it remains vaporware after decades of research indicate that such representations are still something of a holy grail. In fact, we still have not gotten much farther than the work of Alan Kay, the Xerox PARC researcher who invented the pull-down menus, folders, and point-and-click icons that Steve Jobs exploited for the Mac. In an article on interface design published in 1990, Kay was already criticizing the overreliance on simple visual metaphors like trashcans. Instead, he argued, magic and theater offered better models for the construction of robust user interfaces. For an example, Kay analyzed the now completely "natural" metaphor of the terminal screen as a piece of paper that we mark on. "Should we transfer the paper metaphor so perfectly that the screen is as hard as paper to erase and change? Clearly not. If it is to be like magical paper, then it is the *magical* part that is all important."[188]

Kay's emphasis on magic indicates that the supernatural

metaphors that saturate technoculture may have a more substantive basis than the fondness that many hackers have for Sandman comic books or D&D. These metaphors arise and take power because, as William Irwin Thompson noted in a discussion of computer games, "the conventional worldview of materialism is not subtle enough to deal with the complexities of a multidimensional universe in which domains interpenetrate and are enfolded in one another."[189] The science-fiction author Vernor Vinge came to a similar conclusion in "True Names," a brilliant novella whose vision of a networked virtual world predates *Neuromancer* by three years. Unlike the bright neon grid of Gibson's cyberspace, the Other Plane of Vinge's story is a Tolkienesque world of swamps, castles, and magic, a half-dreamed environment that is generated partly through electronic cues that stimulate the "imagination and subconscious" of its electrode-wearing users. The hacker denizens of the Other Plane band together as covens of witches and warlocks, and at one point, a few of them discuss how magical metaphors came to dominate "data space":

> The Limey and Erythrina argued that sprites, reincarnation, spells, and castles were the natural tools here, more natural than the atomistic twentieth-century notions of data structures, programs, files, and communication protocols. It was, they argued, just more convenient for the mind to use the global ideas of magic as the tokens to manipulate this new environment.[190]

One reason for this convenience is that the allegorical and hieroglyphic language of magic works well with the fact that the Other Plane exists simultaneously on at least two levels of reality. Describing a character approaching the Coven, Vinge writes that while his conscious mind perceived a narrow row of stones, his "subconscious knew what the stones represented, handling the chaining of routines from one information net to another."[191] The Other Plane thus reverses our normal state of mind. Here it is the *conscious* mind that moves through a world

of archetypal imagery, while the subconscious concerns itself with logical information processing.

As Vinge suggested, these technomagical conceits also function as strangely fit metaphors for the workaday world of computer programming itself, in *Turing's Man,* Jay David Bolter quotes computer specialist Frederick Brooks: "The programmer, like the poet, works only slightly removed from pure thought-stuff. He builds his castles in the air, from air, creating by exertion of the imagination. . . . Yet the program construct, unlike the poet's words, is real in the sense that it moves and works, producing visible outputs separate from the construct itself."[192] This is not a very satisfying description of poetry, but it certainly describes the virtual aspirations of the magician. No wonder that ace programmers and UNIX weenies have long been called "wizards," or that the semiautonomous UNIX programs that kick into action on their own accord are known as "demons." Steven Levy's *Hackers* drips with loose references to spellcraft, while *The New Hacker's Dictionary* gives definitions for "deep magic," "heavy wizardry," "incantation," "voodoo programming," and "casting the runes."

Such metaphors infected the computer underground of hackers as well. When young digital pranksters started "breaking into" unauthorized computer systems through network dialups, they were in many ways simply playing Adventure online. Naturally, such hackers also took on colorful, sardonic nicknames, many plucked from sword and sorcery. Enterprising young men like Erik Bloodaxe, Black Majik, Kerrang Khan, the Marauder, and Knight Lightning would band together in underground groups like the Legion of Doom, the Knights of Shadow, and the Imperial Warlords. In his book *The Hacker Crackdown,* Bruce Sterling notes that the relatively notorious Atlanta hacker Urvile was also a fanatic Dungeon Master who "barely made the distinction" between fantasy games and cyberspace; the Secret Service agents who seized Urvile's personal notes found role-playing scenarios mixed helter-skelter into hand-scrawled records of his intrusions into actual computer systems.

The plot of "True Names" also concerns a conflict between agents of the state and the Other Plane's freewheeling information brokers, a conflict that Vinge stages in terms of cryptography. Vinge's hackers do not use the U.S. government's encryption schemes, but those that had leaked out of academia "over NSA's petulant objections." Vinge was prophetic: over a decade after his story appeared, the federal government and digital libertarians became embroiled in similar debates over encryption standards, privacy, and online security. For their part, the feds stirred up the usual bogeymen (terrorists, drug dealers, pedophiles) to ensure that the NSA and other state agencies would have backdoor access into any computer system or bit of email that intrigued them. In response, a loose network of online advocates, businesspeople, and scruffy "cypher-punks" raised a mighty stink, while powerful home-brewed encryption software slipped into the Net.

Though magic metaphors and secret codes operate according to very different rules, they are hardly historical strangers. Take the incantations of the *Steganographia,* a trailblazing cryptographic text written by the enigmatic Trithemius of Wurzberg. Born in 1462, Trithemius was a prodigious scholar and humanist who took over the monastery of Sponheim at the precocious age of twenty-three. Displaying the infomania of so many Hermeticists, Trithemius transformed the monastery's paltry store of forty-eight books into a library of nearly two thousand volumes. His collection of occult texts alone made it one of the greatest libraries in all of Germany. The man was also heavily into creating secret codes; a copy of his *Polygraphia,* an innovative if primitive book of secret writing, is housed today in the NSA museum near Washington, D.C.

Far more curious is the *Steganographia,* which was apparently revealed to Trithemius in a dream. Though the first two books of this popular and influential work appear to be compendiums of spells, they have long since been recognized as systems for encoding messages; the mysterious name that heads each section simply indicates which decipherment key to employ. In the third book, however, Trithemius unveils what

seems to be a complex system of astrological magic, one that exploits the sorts of numerological incantations and esoteric alphabets used by sorcerers and Kabbalists to interface with astral intelligences. Trithemius also describes how images of various cosmic forces can be etched into wax in order to capture and manipulate their powers. Apparently, the abbots goal was nothing less than long-distance communication through the ether; he claimed his wax images and spells would create an astral network that, with the aid of Saturn's angel Orifiel, would allow the delivery of mental messages within the UPS-worthy window of twenty-four hours. Moreover, Trithemius's code was also a means of acquiring universal knowledge, of knowing "everything that is happening in the world." Though the third book of the *Steganographia* was recently discovered to be nothing more than an elaborate cryptogram, this revelation does not entirely banish the shadows that hover around the abbot's code. For why would Trithemius disguise his cryptography as black magic when black magic could (and did) get him into such serious trouble?

For the adventurous mathematical and occult minds of the Renaissance, astral programming was by no means limited to the archons of the Zodiac. Using an elaborate and highly coded system of theurgic magic, the Elizabethan court astrologer John Dee also sought "the company and information of the Angels of God." As faithful messengers of light mediating God's omniscience, angels were the original intelligent agents—immaterial, rational, stripped of human emotion. Contact with them could open the gates to the invisible cosmos of knowledge, those abstract Neoplatonic spheres that, in Dee's mind, were suggested by mathematics and occult lore alike. Dee made his acquaintance with the angels through a rogue named Edward Kelley, who claimed to see the entities in the surface of a "shewstone." Dee and Kelley communicated with their daemonic companions through a confusing but linguistically consistent angelic language known as Enochian, but Dee still had no way of knowing whether his online buddies were angels or evil demons in disguise. To pierce this virtual ambiguity, which all

of us may come to know far too well, the pious Dee spent much of his online time trying to establish the authentic identity of the angelic bots he encountered.

Scholars of the occult continue to debate the psychological status of Dee's experiences, with a number suggesting that he was simply being conned by Kelley. No matter. From the perspective of the digital dreamtime we now stand on the lip of, Dee's Enochian Calls—like Trithemius's astral encryptions, Vinge's Other Plane, Adventures digital allegory, and Bruno's mechanical memory—provide a compelling snapshot of the strange interzones that erupt when dreams and phantoms invade information space. Whether we want them there or not, magic metaphors seem to arise almost spontaneously when we attempt to interface with the "mental space" of information and to map its "true" interdimensional structure. But what happens when you also get real people moving around inside such consensual hallucinations? To answer that question, we must return to that marvel of engineering that Will Crowther worked on when he was not spelunking or hacking Adventure: networked computers.

Dungeons & Digizens

In 1979, the same year that Vinge wrote "True Names," two students at Britain's University of Essex named Roy Trubshaw and Richard Bartle built a network gaming system that allowed different people on different computers to occupy the same database at the same time. They called their text-based world the Multi-User Dungeon, or MUD for short, and it transported players logged into the university network into an Adventure-like gamespace known simply as "the Land." As with Adventure, the computer screen served as an evocative textual window onto a world full of spells, treasures, and neomedieval combat. After reading the description of your immediate surroundings (and any objects you might pick up, buy, or steal), you would type the direction you wanted to go, and the screen text would change, providing you a description of your new location. But you would

.ilso encounter some rather spunky dwarves and warriors as well, characters animated by real human beings hunched over keyboards somewhere on the Essex network. When two characters crossed paths, they read each other's descriptions, after which they might strike up a keyboard-clattering chat or start swinging battle-axes over loot. And thus it was that Trubshaw and Bartle brought role-playing games online, giving birth to the cyberspace doppelganger eventually known as the *avatar:* digital doubles that embody the user's point of view and that also represent him or her to the other denizens of the digital environs.

Despite the lag times and the loss of D&D's oral storytelling, role-playing games and networked computers proved to be a match made in purgatory. Bartle exported MUD code across the world, and over the next few years, other codesmiths hacked together similar programming systems with similar greasy-kid-stuff names like MUCK, MUSH, and MOO. These early MUDs were devoted to variations on the sword-and-sorcery theme. Pouring countless hours into the simple but compelling tasks of avoiding death and delivering it, the bloodthirsty undergraduate geeks that made up the bulk of MUDders would gradually accumulate the wealth and experience points that allowed them to climb up the social hierarchy of the MUD. Near the top rung hovered the coveted status of wizard, at which point the MUD gave players some direct control over the MUD database itself. In some systems, even the "wiz" was trumped by the "gods": demiurgic sysops who wrote and administered the world and could change its basic features and rules at will.

MUDs thus functioned as toy cosmologies, their graded levels of personal power mimicking both the ladders of the corporate world and the hierarchical degrees of Freemasonry, where novices ascended through esoteric grades that granted them increasing spiritual powers. Many MUDs also took place within fictional worlds poached from fantasy and science fiction, material like *Star Trek,* Tolkien, or Anne McCaffrey's *Dragonriders of Pern.* Literalizing the medieval perception that the world is a book, these so-called "theme MUDs" redeployed the characters, social conditions, and geographies of genre fiction

into an interactive virtual milieu. As with the cosmologies that once saturated premodern societies from end to end, theme MUDs allowed role players to express their individual creativity within the framework of a shared mythos.

Still, with their compulsive drive toward violence, treasure, and increased power, crude "hack-and-slash" games dominated the world of MUDs until 1989, when a Carnegie-Mellon grad named James Aspnes changed the nature of the game. Aspnes's TinyMUD jettisoned strict ranks, ceased logging experience points and killing off characters, and, most notably, allowed players to participate directly in the ongoing construction of the MUDspace themselves. Though not designed to overthrow role-playing games, TinyMUDs nonetheless began attracting netheads, many of them female, who had little interest in skewering trolls. With an egalitarian do-it-yourself creativity programmed into the environment itself, TinyMUDs went social, players became inhabitants, and close-minded contests of mayhem gave way to the open-ended games of life: camaraderie, sex, gossip, debate, and factional politics, most of which tended to revolve around the rules and regulations of the MUD itself.

Though these new worlds distanced themselves from their hack-and-slash ancestors, the tropes of magic continued to come in handy, simply because they fit the weird rules of social reality that define life in a MUD: shape-shifting, teleporting, telepathic communication at a distance, and especially the power of words to shape the world. On MUDs, language is performative—uploading the message that you are squeezing a chicken is the same thing as squeezing a chicken. More technically savvy MUDders also manipulate the hidden programming language that runs the world, fashioning golemlike bots, or doubles of themselves, or roving independent eyes. As Julian Dibbell noted in a *Village Voice* article about a virtual rape on the MUD LambdaMOO, MUD language invokes the pre-Enlightenment principle of the magic word: "The commands you type into a computer are a kind of speech that doesn't so much communicate as *make things happen,* directly and ineluctably."[153] Or as one Pagan MUDder told the author, "If

you regard magic in the literal sense of influencing the universe according to the will of the magician, then simply *being* on the [MUD] is magic."

Nonetheless, "social MUDs" rang the death knell for traditional sword-and-sorcery imagery. In anarchic romper rooms like Lambda-MOO and PostModern Culture MOO, users stitched together their avatars from comic books, fashion magazines, or rock lyrics, while the rooms that people built were collages of media references, Lego sets, and conceptual art. Without any shared purpose or mythos, social MUDs became almost as fragmented, heterodox, and ordinary as life on the street—or at least life in a university dorm. This development was not universally appreciated. For many combat MUDders, removing the possibility that your character could die deflated the driving force of MUD life, replacing it with the idle banter of a parlor game or the chat rooms popular in other regions of the Internet. Their argument goes to the heart of avatar ontology; Do we identify with our online selves because they are as liberated as we want to be, or because they are as constrained as we really are? For old school MUDders, the distinction between being IC (in character) and OOC (out of character) was also vital, if not always crystal clear. But social MUDs in many ways erased or merged these two categories, creating strange new possibilities for online identity and interaction.

As Thanatos fled the scene, Eros moved in to take its place. Many social MUDs became hotbeds of romance, and swordplay was replaced with the gropes and thrusts of netsex, the online world's moist and potent blend of phone sex and raunchy penpal letters. Nonetheless, this virtual carnality continued to percolate with the occult energy of the phantasm. After all, the Neoplatonic cosmology of the premodern West in many ways "ran" on Eros, in the broad sense of life force and beauty as well as sexual attraction. Eros provided the magnetic lines of energy that alchemists and hermetic magicians tapped to align themselves with cosmic forces and to cast spells on people. Such enchantments have not quit us, however much we have left the hermetic worldview in the dust. For people in the throes of a

crush or a sexual obsession, the Other takes on a daemonic intensity that can drive us from all reason, sending us off on adventures that are more often than not fueled by incessant dreams and figments of desire. Just as the arresting phantasms of pornography have taken the Net by storm, so too has the phenomenon of the lustful crush found itself strangely amplified by the disembodied electro-erotic banter in MUDs and online chat rooms. Deprived of visual cues and immersed in the ambiguities of textual self-description, virtual lovers often find themselves in a seductive Rorschach blot of mutual projection and tantric play.

MUDs also awakened a broader range of imaginal desires by allowing people to construct and experiment with new identities within a genuine social space. As Sherry Turkle put it, "When we step through the screen into virtual communities, we reconstruct our identities on the other side of the looking glass."[194] Gender switching is only the most obvious example of the fluidity of the self in MUDspace, where the relatively fixed identities that structure our everyday lives melt into a fluctuating and protean play of masks, characters, and personae. Many MUDders possess more than one character, or "morph" into different characters during the course of a single session: a werewolf, a paramecium, a Japanese schoolgirl named Keiko. In MUDs, we do not just traffic with phantasms—we become them.

This flurry of self-experimentation is taking place at a time when, for many different reasons, human identity seems up for grabs. The visible bouquet of sexual possibilities and body modifications throws our stable images of flesh and gender into doubt, even as advances in biochemistry, genetics, and psychopharmacology argue that many of the elements of personality that we take for granted are nothing more than symphonies of neurochemicals and hardwired genetic habits. Identity is literally fragmenting; cases of multiple personality disorder have risen exponentially since the early 1980s, along with reported incidents of near-death experiences, spirit encounters, and UFO abductions. At the other end of the cultural spectrum,

many influential postmodern theorists vociferously attack the notion of an authentic or essential self, arguing that identity is actually a multiplicity, a variable "social construct" hammered together by a host of changing cultural and historical forces.

For the most part these arguments are rather esoteric, but our excessively mediated technological environment could well be mainlining the postmodern identity crisis to the masses. Turkle cites the psychologist Kenneth Gergen, who describes the "saturated self" that emerges now that communications technologies allow us to "colonize each others brains." We begin to feel like routers or switches in vast networks of images, voices, and information, as if the boundaries of the self are dissolving into amorphous systems of data flow. Like the "subject" dissected by postmodern theorists, the online self is constantly under construction.

But as the neomedieval origins of the online avatar suggest, the postmodern virtual self may come with a premodern twist. The "morphs" that people inhabit on MUDs recall not only the digital graphics engines that gave us *Terminator 2s* melting cop, but the pagan transformations of Ovid's *Metamorphoses.* Many MUDders and other online changelings would chime in with the wizard Tuan Mac Cairill's cheer in the Irish tale *The Voyage of Bran:* "A hawk to-day, a boar yesterday, / Wonderful instability!" This is the song of the shaman, whose archetypal popularity in contemporary spiritual culture cannot be chalked up simply to colonizing New Age romanticism. The shaman changes shape, interbreeds with animals and inhuman cosmic forces, and even scrambles gender roles through cross-dressing and other tricks. Moreover, the shaman leaves his or her body to enter an immense and incorporeal soul-space teeming with images, information, and entities, many of them quite hostile and deceptive. Of course, the shaman also returns from the bowels of the earth with medicine to heal the tribe, whereas we return from a night of MUDding or netlust with aching eyes, sore wrists, and often a vaguely hollow feeling of spent life force.

The psychological, social, and even spiritual fallout from the widespread adoption of avatars remains a complex question.

Will these masks be shadow selves, wish-fulfillment figures, energy vampires, or disposable video game tokens? How will we relate to them and with them? What is their ontology? In this regard, the fact that digital doubles are called avatars seems more than happenstance. The Hindu religious term was first used by the Lucasfilm creative designer Chip Morningstar to describe the crude cartoon figures that players used to move around Habitat, an extremely popular multiuser graphical virtual world developed in Japan by Fujitsu. The terms popularity spread after Neil Stephenson used it in his hit science-fiction novel *Snow Crash* to describe the home-brewed digital getups and off-the-shelf costumes that people don in the online virtual world he called the Metaverse, a crowded and cacophonous strip mall vastly more believable than Gibsons cool geometric grids. *Avatar* literally means descent, and in Hindu lore, it denotes the various incarnations a god may take in this world—some Hindus believe that both Rama and Buddha are avatars of the creator god Vishnu. Avatars possess a dual identity. On the one hand, they are separate from the godhead, receiving only a portion of its spirit. On the other hand, avatars are also indivisible from the godhead, because the gods remain in constant communication with everything they touch. While replicating this ambiguous overlap of identity and separation, today's digizens have also turned the scheme on its head: We now *disincarnate* into fleshless "godlike" forms, though it remains to be seen whether this projection can be considered an ascent or a descent, a climb through Purgatorio or a plunge into Inferno. For hardcore Hindu yogis, cyberspace might seem like nothing more than a fresh layer of *maya,* the veil of illusion that cloaks and distorts our perception of reality. In their burning eyes, the pocket universes we're building out of protocols and pixel dust might seem like dreams within a dream, a labyrinth of distracting desires leading ever farther from the Source.