

designing the simcit

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Networking

On October 6, 1992, an article entitled "A Weekly International Classroom, Via TV Link" appeared in the New York Times. An unnamed Times reporter writes from Williamstown, Massachusetts:

"Ready to make History? You can tell your grandchildren about this."

Just seconds after Mark Taylor, a professor of religion, made this pronouncement recently to 10 students in a classroom here, the group was joined by eight students from the University of Helsinki and Esa Saarinen, the chairman of the Helsinki University philosophy department. But the nine Finns did not enter the rooms through the doorway, they appeared on two television screens.

The history made was the opening of a "global seminar," created by Professors Taylor and Saarinen through the use of teleconference technology.

Yes, there is a blackboard in the Williamstown classroom for use in other courses. But when this seminar convenes for its three-hour session every Wednesday afternoon — Wednesday evening in Finland — the blackboard stands in the corner, seemingly as outdated as the rotary telephone.

The tools of learning in this classroom include video cameras, microphones, televisions, and the fiber-optic cables that carry video and audio signals between Helsinki and Williamstown ...

The course, titled "Imagologies," focuses on modem forms of communication and their effects on contemporary culture ... From the time he decided to study the effects of modem technology on culture, Professor Taylor said, he has had little interest in doing so from a distance. "I could teach this syllabus as a regular course," he said "but I thought, let's try to bring theory and practice together. Let's try to think critically about what we're doing and doing what we're thinking about."

What are the implications of the global classroom for the university? How will the net in which we have all become entangled change teaching, writing, and scholarship? What will be the architecture of the global university? How will it be designed? How will the net transform architectural theory and practice? Though I am far from having sorted out the implications of what we accomplished and failed to accomplish in our experiments in network education, I can honestly say that Imagologies was the most extraordinary educational experience I have ever had. As a result of this course, I am being forced to reconsider many of the assumptions that have guided my teaching and writing for many years.

Learning from Tokyo

Akihabara at Night: circulation, endless circulation, and relentless circulation. Circulation that seems to come from and lead nowhere - vertical, horizontal, lateral, on the streets, on the walls, in the air. Circulation without a heart, circulation without a center — or with 10, 12, perhaps more centers.

Akihabara is a city within a city. The same pulse beats simultaneously in Shinjuku, Ginza, Ueno, Shibuya, Roppongi, and elsewhere.

Though nothing is disorderly, a riot is always under way. A riot of signs — audio and visual signs that create a dizzy, sensuous cacophony. Incomprehensible images and unreadable signs flash everywhere. The brilliant, gaudy neon colors of electric signs contrast sharply with the muted black and white of the cars and clothes of the mobs that perambulate at the feet of these latter-day icons. The noise becomes a mesmerising din that approaches a ritualized murmur.

Akihabara, one of the most vital commercial districts in Tokyo, has the largest concentration of electrical and electronic stores in the world. The street is an open arcade, a frenzied bazaar. Interiority and exteriority fold into each other to create surfaces that know no depth and yet are not superficial. Walls become screens that unveil nothing but other screens. Hundreds, perhaps thousands of tiny shops and large stores display an incomprehensible array of the latest technological devices and consumer goods. Everything seems to be running, nothing standing still. Relentlessly bombarded by images, everything is drawn into the play of signs until every substance becomes unbearably light. Everywhere I turn, I see my image projected on flat screens. Cameras I cannot locate expose me to angles of vision I have never before glimpsed. This is the society of spectacle run wild. If Japan is "the empire of signs," the emperor seems to be signs and images that reflect only themselves. When compared with Akihabara, Las Vegas is a small town from an earlier epoch. Akihabara is the future that is already in our midst. We must learn the lessons it can teach us.

Terminal Space

The air is filled with information that floats freely and invisibly until it is transformed into images and projected onto surfaces around, above, and below. The mediascape is Tokyo. In 1991, Arata Isozaki mounted a show in London's Victoria and Albert Museum that he initially entitled "Simulations", but later named "Visions of Japan".

In one of the rooms, Toyo Ito produced a dreamspace that staged something like a hallucinatory revival of perception. In place of a foundation, a floating floor 10 x 28 meters was formed by opaque acrylic panels and surrounded by a five-meter-high liquid crystal media wall that was electronically controlled with a translucent veil hanging from the ceiling. Every surface was a screen on which 44 projectors cast constantly changing images of Tokyo. Synthesized music from 16-channel speakers filled the room. As I roamed through the terminal space of this simulated city, I became a screen on which images ceaselessly played. The longer I lingered, the more uncertain I became whether the exhibition was a simulation of Tokyo or Tokyo was a simulation of the exhibition.

The city of the future, which is rapidly approaching, is a simulated city. This simcity reflects and embodies a revolution that is as radical and thoroughgoing as the psychosocial transformation brought by the invention of the alphabetic letterpress in 15th-century Europe. Print technology opened the typographic space that electronic compu-telecommunications technology brings to closure. What are the implications of this revolution for the spaces, in which we live and work, the cities in which we are beginning to dwell, and the architecture we are destined to practice?

Life in the Net

The space of the simcit is neither Newtonian nor Euclidean; nor is it precisely Einsteinian. Rather, it is what has come to be known as cyberspace. Cyberspace, explains novelist William Gibson, is "a consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts ... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity, lines of light ranged in the nonspace of the mind, clusters and constellations of data."

To a certain extent, we already inhabit and are inhabited by cyberspace. The world in which we live is rapidly becoming an increasingly complex global network that is created and sustained by sophisticated electronic telegraphic telephonic-televisual systems. It is not clear whether this network is an electronic prosthesis of our organism or our minds and bodies are psychophysical prostheses of the immaterial web in which we are caught.

It is, however, apparent that cyberspace constitutes an environment that is thoroughly simulated. The contrast to representation in which a signifier always refers to a definable signified, simulation generates a nonreferential space in which every image is an image of another image and all signs are signs of other signs. In cyberspace, the real is hyperreal and reality becomes virtual. In different terms, as the real becomes imaginary, the image becomes real. As a result of this conversion process, nothing remains the same. The very forms of experience are transfigured in cyberspace. On the most basic level, the structures of emotion, perception, and conception are changed in ways that change the conditions of all cultural production.

While the emergence of cyberspace results from complex technological innovations, it is important to realize the relationship between this new medium of experience and certain aesthetic and artistic tendencies in modernism.

In its most characteristic and influential guise, modernism involves a progressive abstraction or dematerialisation that presupposes what Paul Virilio aptly describes as an "aesthetics of disappearance." What disappears in the modernist aesthetic is the materiality of the so-called real. More precisely, reality becomes or is disclosed as always having been essentially immaterial. When the real is believed to be ideal, sensuousness and materialism are regarded as superficial appearances that conceal deeper patterns, definitive of truth and reality. In various schools of abstract and nonobjective painting as well as high modern or International Style architecture, the real is identified with abstract form or formal structure. Accordingly, the artistic and architectural task becomes the re-presentation of essential structure in aesthetic form. In this "higher" realism, which is instantly non-representational, the dematerialized object of production effectively depicts a reality that has become surreal. Though not generally realized by artists, architects, or critics, the modernist program of abstraction repeats in a different register the project of Hegelian idealism. While Hegel translates artistic representations into philosophical concepts, the abstract artist transforms spiritual concepts into artistic representations. For neither philosopher nor artist is the goal of abstraction itself abstract. On the contrary, the idealism characteristic of modernism seeks to reconcile the ideal and the real.

When approached in the context of philosophical and artistic idealism, cyberspace can be understood as the fulfilment of the avant-garde's long standing dream of transforming selves and societies by converting art into life. In the realized utopia of modernism, life becomes a work of art. The oeuvre d'art that strives for incarnation was initially defined by Kant and eventually elaborated by Hegel. In the Critique of Judgment, Kant defines the modern notion

of the work of art as a beautiful whole that forms an organic totality in which all parts are harmoniously integrated. Hegel's notoriously complex speculative system is, in effect, the logical outcome of Kant's work of art. The Hegelian idea is an organic structure that synthesizes parts that appear to be antithetical.

When modeled on the work of art, society seems to form a vital totality, in which tensions are reduced, opposites reconciled, and conflict overcome. If placed in the context of historical and cultural evolution, this sociopolitical community seems to involve the recovery of an original harmony that has long been lost.

But how can this ideal be realized? What are the material conditions? What technological developments are necessary to create the net? Since the opening decades of this century, some leading artists and architects have insisted that electricity is one of the primary agents of global integration and unification. For Marinetti, electricity is the elixir that creates the possibility of speed, which enables humankind to break the chains of time and space. In his famous manifesto, published in *Le Figaro* on February 20, 1909, Marinetti declares: "We stand on the last promontory of the centuries! ... Why should we look back, when what we want is to break down the mysterious doors of the impossible! Time and Space died yesterday. We already live in the absolute, because we have created eternal, omnipresent speed." The hallucinogenic effect of speed translates one from the world of time and space into the omnipresence of the absolute. It is important to note that Marinetti was not alone in his search for an aesthetic of speed. Cubism's experiments with simultaneity and suprematism's probing of the fourth dimension can also be understood as a quest for the experience of an all-at-onceness that is an all-at-oneness. As Einstein had argued only a few years before these artistic innovations, when we reach the speed of light, time itself is transformed. Nor was Marinetti the only one to believe that his dream of omnipresence could be realized through electricity. For many early-20th century artists and non-artists, the Eiffel Tower, completed in 1889 for The Paris World's Fair commemorating the centenary of the French Revolution, became the symbol of the New Age. By the end of the first decade of the century, however, the Eiffel Tower and its image had undergone an important change. This change recalls both the shift from the 18th to the 19th century and anticipates the transition from the mechanical age of industrial capitalism to the electronic age of postindustrial capitalism. In 1909, the year in which Marinetti published "Le Futurisme," the first regular broadcast system was installed on the Eiffel Tower. Though Robert Delaunay's painting from this period presents the tower as a synecdoche for modernity, the significance of its electrification only becomes evident in Vicente Huidobro's 1917 work entitled *Eiffel Tower*, which was dedicated to Delaunay.

Eiffel Tower
Guitar of the sky

Your wireless telegraphy
Draws words to you
As a rose-arbour draws bees

In the night the Seine
No longer flows

Telescope or bugle
Eiffel Tower

And a beehive of words
Or the night's inkwell

At the dawn's base
A spider with wire feet
Spins its web with clouds ...

A bird calls
In the antennae
Of the wireless

It is the wind
The wind from Europe
The electric wind

The wire web at the feet of the tower grounds the wireless net created by the signal beamed around the world. For visionaries, the electric wind from Europe promised to unify the planet.

The millenarian spirit inspired by this electric wind sweeps across this century. It is a surprisingly short step from Marinetti's aesthetic of speed and Huidobro's worship of the Eiffel Tower to Marshall McLuhan's global village and the cybertopia proclaimed by true believers in advanced electronic technology. Almost three decades ago, McLuhan argued that "in the mechanical age now receding, many actions could be taken without too much concern. Slow movement insured that the reactions were delayed for considerable periods of time. Today the action and the reaction occur almost at the same time. We actually live mythically and integrally, as it were, but we continue to think in the old, fragmented space and time patterns of the pre-electric age." The movement from the industrial to the electronic age repeats the shift from mechanical to organic metaphors for envisioning reality, and characterizes the transition from the 18th to the 19th century. In McLuhan's neo-romanticism and neo-idealism, organicism displaces mechanism to form an image of a harmonious New Age in which all are one and one is all.

Today, deep in the electric age, the organic myth is a simple and automatic response reducible to mathematical formulation and expression, and without any of the imaginative perception of William Blake about it. Had he encountered the electric age, Blake would not have met its challenge with a mere repetition of electric form. For myth is the instant vision of a complex process that ordinarily extends over a long period. Myth is contraction or implosion of any process, and the instant speed of electricity confers the mythical dimension on ordinary industrial and social action today. We live mythically but continue to think fragmentarily on single planes. Anticipating many of the insights usually attributed to Jean Baudrillard, McLuhan maintains that the implosion characteristic of experience in the electronic age is created by speed. When speed reaches a certain point, time and space collapse and distance seems to disappear.

Elaborating their extraordinary technophantasies, the editors of the wildly suggestive and provocative magazine *Mondo 2000* describe a future, which, in many ways, recalls McLuhans's vision. "The cybernet is in place. If fusion is real, we'll find out about it fast ... We're talking about Total Possibilities - Radial assault on the limits of biology, gravity and times, the end of Artificial Scarcity, the dawn of a new humanism, highjacking technology for personal empowerment, fun and games. Stroking those neuropeptides! Making Bliss States our normal waking consciousness." Though the language of these visions differs significantly

from the balanced discourse of the 18th century, the cybertopia actually represents a refinement of the Enlightenment dream that plays such an important role in modern thought and life. In the present context, four central features of this project are decisive: rationalization, universalization, homogenization, and synchronization. For Enlightenment philosophers, reason, which is definitive of human beings, is essentially universal. In the most exhaustive formulation of this enlightened anthropology, Kant argues that reason is something like a homogeneous grid that is constituted by the forms of intuition, i.e., space and time, and the 12 categories of understanding. Historical progress is measured by the extent to which this grid becomes the foundation for individual and social existence. The movement from infancy and primitivism to maturity and modernity involves the progression from a life dominated by the idiosyncrasies and contingencies of sensuality to a life governed by the universality and consistency of reason.

From one — but only one — point of view, the electronic web spun by compu-telecommunications technology is the embodiment of this universal grid. Within the net, everything is bound together to form an ordered totality. The net displays a relentless logic. Whereas earlier formulations of the logic of the Lebenswelt have tended to be either dialectical (Hegel or Marx) or binary (Saussure and Lévi-Strauss), the logic of the net is digital. In the global compu-telecommunications network, the real is digitized and the digital is real. The digitization of reality makes it possible to communicate at speeds that Marinetti never imagined. Along the channels of the fiber-optic network, disembodied minds travel at the speed of light. As speed increases, distance decreases. Space seems to collapse into a presence that knows no absence and time seems to be condensed in a present undisturbed by past or future. If ever achieved, such enjoyment of presence in the present would be the fulfilment of the deepest and most ancient dreams of the Western religio-philosophical imagination. Protests to the contrary notwithstanding, it is not clear that this dream has actually come true. The point is not simply that the net is incomplete and electronic technology is not universally available. Even if it were possible to imagine the day when the entire world were wired and everyone had access to compu-telecommunications technology, it would still be necessary to admit that holes remain in the net. Indeed, there could be no irreducible gaps that imply a different space for the simcit and its revolutionary "architecture."

From Grid to Network

The recognition of the potential importance of electronic technology for architectural theory and practice is not a particularly novel insight. Over two decades ago, Robert Venturi and Denise Scott Brown distinguished modern from what has come to be known as post modern architecture by contrasting "20th-century communication technology" and "19th-century industrial vision." It has become commonplace to associate the formalism of high modern architecture with the mechanization of industrial production. The functionalism of the machine aesthetic reflects an industrial society that is ruled by the principles of rationality, universality, homogeneity, and synchronicity. What is less often recognized is that the earliest form of mechanical production was the printing press. The regularization of the printing process and the printed page eventually resulted in a grid whose columns and spaces were every bit as uniform as the I-beams and windows of the curtain wall. So understood the space of modernism remains typographic.

Though Venturi and Scott Brown insist on the importance of modern communications technology, they fail to recognize the far-reaching ramifications of the remarkable changes that have been taking place for the past several decades. This shortcoming was probably unavoidable, for the significance of compu-telecommunications technology has only really

become clear in the years since 'Learning from Las Vegas' was published. There is, however, a deeper problem with Venturi and Scott Brown's assessment of the technoscape that results from their consistent confusion of electronics with electricity. What fascinates them is the electricity of Las Vegas. For a generation raised on the ascetic aesthetic of modernism, the vitality and color of "The Strip" proved to be liberating and invigorating. Suddenly the forbidden was pronounced permissible. Signs returned as decoration whose sensuousness was their strength rather than weakness. When high gave way to low, the very foundations of architecture seemed to be shifting.

It is now generally felt that postmodern architecture has run its course. Furthermore, in recent years, it has become increasingly obvious that the so-called innovations of the past 25 years have not really resulted in any fundamental change. Postmodern architecture is, in fact, an extension of the aesthetic principles and philosophical presuppositions of modernism. To attach decorative ornaments to buildings that are essentially modern changes nothing of significance. The putative postmodern revolution is as superficial as the garish ornaments it flaunts. In an ironic twist that lacks any critical edge, postmodern architecture ends in a parody of the avant-garde's utopian dreams. When leading architects take as their mission the task of designing the "Magic Kingdom," the social and political responsibility of architecture disappears. To move beyond the impasse created by postmodernism, it is necessary to reconsider the culture of the simulacrum.

Even though contemporary electronic technology requires electricity, the network subverts the grid and inverts many of the most important characteristics of modernism and postmodernism. The changes brought by the expansion of the electronic environment are both obvious and subtle. It is undeniable that the emergence of the modern city would have been impossible without the discovery of electricity. From transportation and communication to commerce and industry, electricity provided the energy to run the city. Urbanism and centralization brought with them a concentration of people and resources. As these processes continue and even accelerate making space scarcer, electricity creates the possibility of expanding above and below the ground. When carried far enough, however, this concentration reaches a breaking point and issues in an implosion that reverses the movement of centralization.

While electricity concentrates, electronics disperse. It is a vast oversimplification to insist that the net merely universalizes, homogenizes, and synchronizes, for compu-telecommunications technology also particularizes or individualizes, differentiates, and diachronizes. On the most obvious level, computers and telecommunications render the central workplace obsolete. Individuals no longer have to be physically present to work together. As offices, homes, hotels, and even cars, trains, and planes become "smart," the workplace is dispersed. The point is not simply that edge cities are replacing urban centers; the spatial dislocations occasioned by electronic technology are far more drastic. The traditional oppositions that structure daily life as well as architectural practice (e.g., exteriority/ interiority, public/ private, work/ home, urban/ suburban, town/ country, etc.) are being overturned. In addition to this, communication lines are replacing transportation lines (e.g., roads, tracks, and air links) to create an environment in which the movement of information supplants the movement of bodies.

Nor is the dislocation effected by the network only spatial; it is temporal. While industrialization required a synchronization that made the workers' day as rigidly structured as the assembly lines on which they labored, compu-telecommunications creates the possibility of irregular schedules and endlessly changeable flex time. Just as workers no longer need to gather in the same place, so they do not have to work at the same time. The desynchronization

of local schedules creates the possibility of the synchronization of international schedules. When adequately wired, a person can work simultaneously in New York, Paris, and Tokyo while living in the remote mountains of Massachusetts.

The spatio-temporal dispersal brought about by electronic technology creates an infinite nomadism that is not necessarily a condition of exile. Though homecoming no longer seems possible, homelessness is not inevitable. In cyberspace, the site of dwelling floats as freely as the network that is its enabling condition. Suspended in an immaterial web whose reach exceeds our grasp, all action becomes action-at-a-distance. By creating the actual conditions of interconnection about which philosophers have only speculated, the global electronic network amplifies every action on the stage of world history.

The importance of the compu-telecommunications revolution for architecture is unmistakable. The city as we know it might well be a relic of the past. Homes, schools, and factories adapted to the industrial age are outmoded in the information age. If they are to be functional, buildings must become smart. Furthermore, as pen and paper give way to computer-aided design and virtual spaces whose reality is thoroughly simulated the very methods, tools, and techniques of architectural design are undergoing a thorough transformation. Though these developments are extraordinarily important, the changes already under way are even more profound than they suggest. The very conditions of architectural theory and practice are irreversibly altered by electronic compu-telecommunications technology.

As I have noted, Kant presents the decisive formulation of the modern understanding of space and time in his analysis of the forms of intuition. The distance of two centuries obscures the radical nature of Kant's analysis. Calling for an epistemological version of the Copernican revolution, Kant argues that space and time are not objective conditions in the world, but are subjective conditions of experience. Subjectivity does not, however, imply idiosyncrasy, for, as Kant maintains, the forms of intuition are universal.

The subjectivity of the structures of intuition and understanding reflects the structure of subjectivity and is neither individual nor contingent but is universal and necessary — as universal and necessary as the grid that is its graph. In retrospect, it appears that Kant's position was a holding action that inevitably gives way to more radical perspective. Whether considered objectively or subjectively, space and time are not natural, given or universal. On the contrary, they are cultural products that are configured variously in different socio-historical contexts. In the late 20th century, the compu-telecommunications network is thoroughly transforming the structures of space and time. Infinitely permeable and completely iterable, the net spatializes and temporalizes without being either place-bound or time-bound. Its place is anywhere, which is neither everywhere nor nowhere, and its time is anytime, which is neither ephemeral nor eternal. While the space-time of the grid is a representation of the typographic space of the book, the space-time of the network is the re-inscription of the spacing of the hypertext.

A hypertext is not a closed work but is an open fabric of heterogeneous traces and associations that are in a process of constant revision and supplementation. The structure of a hypertext is not fixed but is forever shifting and always mobile. The interplay of surface and depth gives way to a perpetual displacement of surfaces, which is anything but superficial. Branching options multiply, menus reproduce, windows open on other windows and screens open on other screens in a lateral dispersal that disseminates rather than integrates. Hierarchy unravels in a web where top and bottom, up and down, lose all meaning. Everything ... everywhere is middle. A hypertext is not an organic whole but is a rent texture whose

meaning is unstable and whose boundaries are constantly changing. There is no clearly defined, pre-established path through the proliferating layers of a hypertext. Though the network is shared, the course each individual follows is different. Thus, no hypertext is the product of a single author who is its creative origin or heroic architect. On the contrary, in the hypertextual network, all authorship is joint authorship and all production is co-production. Every writer is a reader and all reading is writing. Though sometimes printed on a page, the medium of the hypertext is essentially electronic. Neither simply universal nor individual, general nor particular, fixed nor fluctuating, structural nor amorphous, grounded nor groundless, original nor copy, hypertextual space displays and evokes an alternative architecture.

To move beyond modernism and its covert extension in post-modernism, architecture must give up its devotion to the book and must dare to become hypertextual. Hypertextual building would no longer be architecture in the strict sense of the term, but would become something like electroarchitecture whose outlines are only dimly visible. In contrast to so-called revolutions of the past in which one alternative replaces its opposite, electroarchitecture calls for a refiguring of the very terms that define architectural theory and practice. To render these abstractions a bit more concrete, it might be helpful to reconsider two particular institutions: the university and the museum.

Let us return for a moment to my global classroom. One afternoon a student sent me an e-mail message asking if I could come to a party that evening. Williams is the kind of place where there is supposed to be lots of out of class contact between faculty and students. So, I responded by asking (stupidly) when and where. She replied, "On the net, of course. Anytime you please."

She then proceeded to send me instructions about how to "log in" to a MUSE (Multi-User Simulated Environment) in which she had become deeply involved. MUSES are something like interactive fictions lived out in cyberspace in real time. Participants in these so-called games construct elaborate personae — sometimes one, sometimes many — and these interact with other characters. One has no idea who or where the other participants are. I want to emphasize that all of this is carried out in real time. It is as if the participants are in the same room talking with one another. Through a variety of intricate coding systems, all kinds of conversational combinations can be fabricated. For example, two people can talk without anyone else in the room hearing them. Or a person can be in the room without being seen by anyone. Since everything transpires in real time, the exchange on the terminal screen is incredibly rapid. It was clear that my student had made many friends and had some very intense, indeed strange, experiences on the net. For me, one of the most fascinating things about the MUSE was that many of the participants had constructed intricate structures, in which they lived and conducted their business. These structures were, of course, verbal constructions that were not represented visually. Fanciful homes, schools, offices, and cities constituted the setting for the story. This simulated setting was always changing in ways that made it more interesting and complex. I found the temptation to visualize the architecture of the MUSE irresistible. Once visualized, I began refashioning the world I had entered. I want to emphasize entered. To participate in a MUSE, it is necessary to pass through the terminal screen and enter the tele-electronic world. Once inside this world, it becomes possible to roam through a space that one has never before experienced. At this point the computer ceases being a tool that can be used in design and becomes an environment that can be shaped and reshaped. If the space in which we are beginning to live is, at least in part, cyberspace, then we must begin thinking about the architecture of this space. How can cyberspace be designed? How should cyberspace be designed?

With these questions in mind, let us turn to our second example — the museum. Electronic technology harbors changes in the shape of museums that have yet to be realized. If telewriting is recasting print into something that is neither traditional speech nor writing, electronic technology will bring changes in the shape of museums in ways that few people yet realize. These changes are multiple and complex. In the first place, the museum of the 21st century will, like all other institutions, be international. When the world is wired, the local is no longer merely local. Second, the objects on display will undergo radical change. In the culture of the simulacrum, it will no longer be necessary to exchange the real thing. Reproductions will become "better" than the actual object — be that object, an archaeological artefact, a piece of sculpture or a painting. It is possible to imagine a museum constructed in cyberspace where objects from the entire world are assembled for display. Furthermore, just as telewriting allows readers to become writers, so the museum of the future will allow viewers to become curators. Imagine a museum with an inexhaustible image file and multiple paths that allow navigation through the archive. Each person could then assemble an exhibition from whatever point of view seemed interesting or for whatever occasion seemed relevant.

For more than a century, the model of the museum has been the encyclopedia. Having realized the futility of the enlightenment project of the encyclopedia, the museum of the future will be hypertextual.

The name of the new museum will be the cybermuseum. It is not difficult to imagine the resistance to this new institution. Critics will bemoan the disappearance of the art object and insist that the reproduction cannot do justice to the real thing. In launching this critique, all of the resources of the metaphysics of presence will be invoked to reinvest the original work of art with its unique aura. But the struggle to save the encyclopedic museum is futile because its time has passed. Either museums will enter the age of electronic reproduction or they will die. How might the cybermuseum be designed? A question only architects can answer. I would, however, like to make a few final comments that might outline the parameters within which design questions might be approached. First, one might consider the possibilities created for the design of the physical space of museums by compu-telecommunications technology. How can the museum be designed to accommodate electronic images instead of paintings and sculptures? How will gallery space have to be designed? As technology becomes even more sophisticated, I suspect it will become increasingly common for artists to work in digitized formats that allow for immediate electronic reproduction. When the artistic medium is a computer program, rather than paint or steel, the stability of the art object vanishes and the restrictions of time and space are overcome. One can imagine organizing an exhibition that would be on display in multiple venues at the same time. Or one can envision simulcasting performance art around the world. As the global classroom knows no bounds, the cybermuseum is truly a museum without walls.

Efforts to create structures that can take advantage of today's electronic technology are already under way. The one I find most interesting is Frank Gehry's design for what will become the Bilbao branch of the Guggenheim Museum. Though still in the developmental stage, Gehry is exploring the possibility of including in the museum massive, irregularly shaped screens for the projection of digitized images. What is most intriguing about the Bilbao project is the effort to incorporate electronic technology in the architecture of the building. The problem is not with the software but with the hardware. It remains unclear whether visual resolution can be maintained on such large screens. Whether or not Gehry is successful this time around, I have no doubt that in the near future even more sophisticated display techniques will become feasible.

There is, however, another dimension to the architecture of the cybermuseum that is even more interesting and more suggestive. If the museum becomes something like a visual MUSE, then developing its architecture would require one to enter the space of the computer. One would not simply use the computer to design buildings but would design space by developing computer programs. In this undertaking, the materials of the architect would no longer be concrete, steel, or glass, but would become codes, programs, and images. At this point, architecture becomes electrotecture and the architect becomes a cybertect. If we increasingly live in the space of the simulacrum, then architects must find ways of designing cyberspace. We cannot simply apply design principles that reflect print technology and assembly line methods to the electronic environment. Rather, we must attempt to find ways of fashioning this new space in ways that take advantage of its extraordinarily rich potential.

Above the parking lot for the residential complex in Okawabata Rivercity 21, a massive oval object (16 x 8 meters) rotates slowly. Covered with hundreds of aluminium panels, this strange construction shines brightly silver as it reflects the sunlight. At night its appearance is completely transformed. Five liquid crystal projectors inside the object project images on two translucent screens and on the surface panels. A computer that alters lighting patterns and combines figures from five sources controls the images. As people walk beneath this floating object, they pause long enough to glimpse a fleeting image or passing bit of information. Neither a television or a video screen nor neon or electric sign, the layered surfaces of this televisual space project a simulated environment fabricated from the information that fills the air.

Toyo Ito names his remarkable construction Egg of Winds. The winds gestating in this egg are the winds of information that run the global compu-telecommunication network.

It is the wind
The wind from To(k)yo
The electronic wind.

This wind, which has only just begun to stir, is destined to sweep across the globe. In its wake, nothing will remain the same; all aspects to life will be transformed in ways that cannot be anticipated. Ito's egg is a transitional object — no longer architecture, but not yet electrotecture. Within the fragile shell of the Egg of Winds an alternative space is being born. What shape will it take? What forms will it enable? What structures will it allow? Who will design the simcit that is our future?