From a relational history of technology to the design of a three-dimensional electronic book: "The Encoded Eye, the Archive, and its Engine House."

David Tomas

The traditional book is a mass-produced object, generally rectangular in shape, composed of a sequence of thin flat surfaces that are composed, most often, of paper. These surfaces are bound together and protected by more or less rigid boards. Each conventional book contains a body of common or interconnected information, displayed in the shape of words, symbols, and images, that are sequentially organized and presented on these surfaces or "pages." The range of this information is only limitedby the possibility of its being reproduced in compact two-dimensional form. This artifact's ubiquity as a convenient and economical storage device is related to its powers of reproducibility and standardization: to the fact that all information is reduced, in its context, to a common medium and format that is easily reproduced; to the fact that the book's organizational density (a function of the thinness of its pages) and compact size ensures portability and ease of distribution; and to the fact that a book's limited range of physical sizes, which are determined in part by its portability, allows, in turn, for a common basis for its efficient classification, storage, and distribution in the shape of what is known as a 'library.'

The book is also a singular mode of transportation and communication inasmuch as it can travel across space and time and thus provide a bridge between one place and another as well as between the past and the future through its capacity to carry and disseminate information and ideas. The book can operate in this way because it is a placeless object in the sense that the information that it carries between its protective covers has been deterritorialized and recontextualized within its own space. However, this capacity to deterritorialize is not confined to the graphic symbols that are encrypted between its covers. It can also extend to the human body itself as a reader enters a book's virtual world and her or his imagination is projected beyond the body's material limits. Neither completely present or completely absent, the reader's body floats under the surface of his or her consciousness like the image of an object that seems to reach for the eyes from the depths of a watery medium.

Finally, the book's impact on the human body extends to its senses as some are engaged in a direct way as in the case of the eyes that scan the symbols and images inscribed on a page, or as the fingers of one's hand turn a book's pages, or as a book's particular scent saturates one's nostrils, while all the senses can be engaged in an indirect and virtual manner through the machinations of words and images. The book is thus not only one of the human imagination's and memory's principal archival sites, it is also a powerful medium for their extension through space and time.

Lately, however, the traditional archival and transportational functions of the book have begun to be displaced in various ways by the computer as the former artifact's storage capabilities are increasingly split between diskettes and CD-ROMs which function as both primary (CD-ROM) and secondary (diskette) storage devices and the computer which serves as a primary and secondary storage device and a primary medium of display and presentation. This separation points to an important fragmentation and reorganization of the relationship between

storage, distribution, and display which suggests that the book's form and functions are currently being redefined in the context of digital media and, by extension, also through the new distribution networks associated with the Internet. Such a redefinition and redeployment of functions raises important questions about the future of the storage, display and distribution of print-based and other two-dimensional forms of visual knowledge. How, for example, is the sensory ecology that sustains our book-based reading experiences recalibrated inthe cases of new forms of electronic storage and retrieval sites? How are our senses of time, space, and history being reconfigured as storage and distribution sites change form and are consolidated in terms of computing devices and computing networks. Finally, how is the nature and cultural value of information recalibrated by way of the Internet, new storage devices like computer hard drives, diskettes, Zip disks, CD-ROMs, or the more fluid and ephemeral editing and storage facilities provided by wordprocessing software programs, etc.,? These questions are all the more important because they concern the future of an artifact that has, for the last five hundred years, intimately shaped our memories and our histories, and thus our identities as human beings.

The ubiquitous presence of the computer in most western work and domestic spaces and the fact that it also serves as an interface and gateway to an interconnected information world suggests that we are currently living through a unique period in the history of western media and of their cultures of representation. We are not only the privileged witnesses to an age of the virtual that is gestating at its threshold of emergence, we are also in a position to measure its impact on human memory and history because the computer occupies this threshold, but it is not alone. Other media gravitate around its glowing screen and move in and out of the worlds that meet and interpenetrate at the site of the computer's installation. If words and images appear on the screen, if text and images are generated, then this process is still rooted in an ancient world. The computer's screen rises above an archaeological site to mark the precise location of a threshold of gestation that exists between the analogue and the digital and to suggest that this threshold is also its matrix and thus the only accurate, if paradoxical, measure of its transformative powers.

Although the development and proliferation of the computer is challenging and, in many ways, displacing older systems of storage and distribution, it is also drawing attention to the intrinsic qualities of these earlier systems. The movement of my eyes between the computer screen and the books that often lie open to its side; the movement between my hands as they type information and the same hands that can, a moment later, turn a book's pages in search of information; and, finally, the digital encoding of information versus its periodic inscription by way of a pencil or pen on a piece of paper beside a keyboard automatically trace out similarities and differences between media.

The contrasts and relationships highlighted by these movements are only magnified by the distinction between the traditional archive of the library and new emerging archive of the Internet as the site of research shifts between the one and the other or as it oscillates between the two. Next to the computer there is, as in the case of the research material that occupies the surfaces of the tables in a library, no necessary order and cataloguing of the sources of information that are the potential elements of a new text or book. The activity of research that takes place through the transforming geography of paper, books, computer diskettes, Zip discs, or CD-ROMs etc. leaves in its wake a dissimulated sediment of sources and references.

However, as the offspring of a culture devoted to consumption we are often more interested in

final products than we are in the unstable and ephemeral geography of a research activity and the more so since those products are designed to exist independently of their context and process of production. Thus, the elements that sustain research activity and that serve as the signs of struggle and confusion are invariably destroyed in the interests of creating a tabula rasa for another project, the elements of which will quickly invade the previous site only to be destroyed in their turn. But this choice and its consequences raise important questions about the nature of knowledge and creativity and the cultural values that are assigned to objects, processes, and types of information.

How does one reduce these kinds of questions to the measure of one's own experience? How is one to account for this threshold between the analogue and the digital in a way that can circumscribe a liminal gestational site in order to slow perception down and to render both old and new media and their cultural logics strange in a transcultural anthropological sense? That is, in the sense of balancing between different kinds of information cultures and in the sense of fixing, yet sustaining the freshness of the moment of their intercultural contact so that it might exist in a spatial and temporal sense beyond the immediate dictates of technological progress? How, in other words, can one mine the threshold in such a way as to expose its roots and use it as a pretext to rethink older forms of communication, storage, and distribution while simultaneously using them to rethink the virtual by not allowing it to free itself of history as easily as it seems to be doing?

In the following pages I will describe the historical parameters and some of the theoretical, cultural, and aesthetic issues that were involved with designing an Internet book entitled "The Encoded Eye, the Archive, and its Engine House." The book was designed to address some of the issues that I have raised and it was designed to do so in the context of a structure that was transculturally balanced between different kinds of information cultures and old and new storage, distribution, transportation and communications technologies.

An Intersystemic or Networked History of New Technology and some of its Basic Design Parameters.

The Encoded Eye was conceived in relation to an alternative model of the history of transportation and communications media. The model is based on a reassessment of the hierarchical relationship between product and process and on a proposal to treat the history of media in an interconnected manner. That is, as an intersystemic or networked field that can be mapped in terms of ideational possibilities. [1]

Briefly, our culture operates on the basis of a fundamental distinction between processes of production and products. In my introduction, I noted the presence of this distinction in the case of the physical sediment of research materials and activities that serve as a context for the production of a computer-based text. Clearly, in this example, the research process is separated from its final product since notes, sketches, drafts, and manuscript annotations, errors in orthography and punctuation etc., do not figure in a final published article or book, nor do they provide a context for its reception because the product would then be tied to its site of production thus severely restricting its mobility. A similar distinction can also be clearly seen to operate in the way the history of imaging technologies has been constituted. In this case, the separation between imaging technology and image product is reinforced through distinct sets of physical and sensory attributes and a product's relative mobility in comparison with its site of exposure (photography, film) or its process of manufacture, development, or the site(s) of its

presentation. Discrete collections, exclusive systems of historical classification, and independent archival sites serve to enforce the segregation of means of production and end product. Although the rupture is based on spatial and temporal discontinuities between sites of exposure, processes of production or manufacture and their products; and although it provides an efficient means of classification which, in turn, produces highly specialized knowledge, it does so at the expense of more accurate ways of apprehending and appreciating the cultural and historical singularities of images, their modes of production and reproduction, and the interrelationships between their specialized cultures and those of other technologies of communication and transportation.

Similar kinds of segmentation exist between technologies and their histories. Consider, for example, the cases of photography and the railway system (since these technologies figure in The Encoded Eye's design) -- two of the most powerful technologies of communication and transportation to have shaped our modern world. Although they were conceived and developed in same period (first half of the nineteen thcentury), country (England), and industrial culture by people who, if not in direct communication with each other, were certainly aware of each other's work, they are rarely positioned in historical relation to each other. Thus it is not surprising that they are not linked together economically, politically, socially or aesthetically. Instead of treating these technologies, and other contemporary technologies such as the telegraph and the steamship, in terms of a single historical or cultural frame of reference where they function intersystemically as interconnected networks, they are perceived as isolated industrial and techno-scientific products.

However, contemporary insights about the interconnections between modern imaging systems as well as their historical and perceptual impacts on the human imagination can unlock surprising viewpoints, or unforeseen vistas. An opportunity to experience "four impossibilities" in one's lifetime -- "the ocean-steamer, the railway, the electric telegraph, and the Daguerreotype" [2] -- raises the prospect of an interrelated or networked history of technology. These 1904 comments, by Henry Adams, the American historian, were triggered by the unusual convergence of previously unimagined technological inventions and the new experiential opportunities they presented. His observation implies that it might not be possible to separate these technologies and histories, except through an act of intellectual violence. This insight can force us to integrate the photograph in a larger intersystemic imaging culture that would include ships, railway and telegraphic systems, and eventually the cinema and the newer technologies associated with telephone and computer networks. Although rare, there are examples of this type of integrated approach.

Besides Henry Adams' unusual attempts to measure the historical impacts of the scientific and technological advances of his period, there is one film that addresses the communications and transportation matrix of modernity while simultaneously exploring the nature of its own space, culture, and language. Dziga Vertov's 'The Man with the Movie Camera' (1929) stands to this day as a model of an intersystemic investigation of contemporary communication and transportation technologies in the way that it weaves the pattern of modern existence in terms of transportation and communications media (locomotives, automobiles, trams, aeroplanes, telephones, etc). [3] However, Vertov's model has one basic limitation. It was developed and presented in relation to a governing medium: film. Although Vertov was certainly beginning to think about the interrelations between new communications media in panhuman multi-sensory terms, the political situation in Post-revolutionary Russia after the late 1920s effectively cancelled the possibility of cultivating a more complex, multi-faceted experimental imaging

practice. Since this strategy has not been promoted by other artists or media theorists, one can only speculate about the kinds of histories and media counter-cultures that could emerge from an intersystemic or networked, as opposed to a conventional media-specific or multimedia-based, approach to the history and culture of new media.

Instead of investigating the various characteristics of a given technology's primary communications channel (the photographic, cinematographic,televisual or videographic image) one could focus on the sediment of representations that plot out technology's ideational spaces. Moreover, one could choose to explore this ideational sediment in the manner of an unconventional archaeologist who was only interested in the spatial and temporal relationships that could be woven between the representatives of a group of artifacts situated in its various layers. This archaeologist's sole interest would be in exposing the arbitrary narratives that emerged as a consequence of various couplings of images in the sediment. He or she might even be bold enough to couple sedimentary images and actual three-dimensional artifacts. The conventional idea of a new technology would be undermined and basically transformed by this type of archaeological activity because nonlinear and transdimensional methods of association would replace the quest to establish the kinds of simple temporal sequences that serve as the elementary lineages that nourish an evolutionary commodity-based model of history. Since this model sustains the idea that new technological forms create privileged sites for new kinds of previously unexperienced sensory activity this belief would also be undermined through a displacement in point of view and through the creation of new transhistorical and transdimensional networks of sensory experiences. Where, in the context of these networks, would any given new technology begin and where would it end? Would it begin with the images that it produces? -- with the first sketches of the idea that it finally represents? -- or, instead, with arbitrary entry and exit points in a sediment of ideational possibilities?

Insofar as the concepts of 'new' and 'original' are conceived in terms of a progressive model of history, they must also be reformulated to take account of a multitude of possible beginnings and endings or entry and exit points. Such an approach would also change one's perception of an artifact's representational product in the cases of imaging systems from photography to computing technologies because it could also be treated in the same multiple senses as its means of production. What epistemological and aesthetic results could one expect from this shift in point of view and this deviation and potentially limitless digression in one's understanding of the relationship between an imaging system and its products through the telescoping of the latter into the former and vice versa? How, for example, would a digital image change if its code (a beginning) were rendered visible (as an end product) and if it were treated as an image of equal stature? How would the two be positioned in relation to each other, to the software and hardware environments that physically sustain them, and to an outer environment that might only be equipped to process one category or kind of visual information? Where would the two representations begin and end since they are similar and yet so radically different? Finally, how would one navigate through a design environment that acknowledged these kinds of equalities and insisted, moreover, in articulating them in relation to a networked history of communications and transportation media? The Encoded Eye was designed with such questions in mind.

The Encoded Eye, the Archive, and its Engine House

URL: http://www.cddc.vt.edu/encodedeye/.
The "Encoded Eye, the Archive, and its Engine House" was designed to investigate the nature

of the changes that the book as object could be subject to when it was translated through digital media and projected into a new kind of distribution space. However, The Encoded Eye did not focus on transformations in the book's textual presentation in the tradition, for example, of British Vorticist or Russian Constructivist typographic explorations and innovations in the spatialization of words. Instead, it explored the book's transformation as visual and cultural object in the context of a specific architectural model of storage and distribution while retaining a tension between the two-dimensional physical characteristics of the printed page and the computer screen. Within the context of The Encoded Eye's design parameters, these limitations were significant because the computer was conceived from the beginning as the traditional book's final frontier, its screen the first and only page.

The Encoded Eye's basic structure was derived, in keeping with an interconnected history of technology, from a series of correspondences established between two key fixtures of nineteenth century London: The Circular Reading Room of the British Museum and the Camden Town Circular Engine House, also known as the Roundhouse. The Roundhouse was designed by Robert B. Dockray and his assistant Mr. Normanville under Robert Stephenson for the North-West Railway. It was built in 1846. The Circular Reading Room's basic design was proposed by Antonio Panizzi in 1852 and its construction was completed by 1857.

These architectural structures can be viewed as highly integrated solutions to the problem of designing large-scale archival or storage, retrieval, and distribution complexes for the new artifacts or new concentrations of artifacts produced during the Industrial Revolution. [4] The Roundhouse, the first circular railway shed, was designed for the storage and distribution of locomotives. The British Museum's Circular Reading Room was designed for the storage and distribution of print-based knowledge and information. Although both sites were constructed for different kinds of artifacts (locomotives and books) similarities in design suggest a series of analogies and correspondences in their cultural and historical functions. Moreover, since they provided similar solutions to the problem of storage and retrieval for an age that would radically redefine modes of transportation and communication, their integration in a project that was designed for acomputer-based imaging environment would highlight their importance as references for any future investigation of, or attempt to explore alternative design solutions for the storage and retrieval of information or large scale digital artifacts in a new information age. But their displacement and relocation would also create a powerful spatio-temporal compression and significant fold in history because a new integrated site would automatically become an interface between the past as represented by these two remarkably similar architectural sites and the future as represented by the technical and aesthetic possibilities of the Internet when conceived as a medium for the production and distribution of print and pictorial forms of knowledge. However, the choice of the Circular Reading Room and Camden Roundhouse as the visual references for an Internet book was not just historically inevitable (one could imagine beginning with another key architectural proposal such as Jeremy Bentham's Panopticon), it was spatially and temporally fortuitous because I was personally acquainted with both sites. Hence, the choice of sites and chapter contents were also integrated in autobiographical terms.

The Encoded Eye's Autobiographical Elements

I would like to think that it was as a bibliophile that I visited the Circular Reading Room, in 1997, on the last day that it was open to the public (the British Library having been relocated in a new building); and I would like to think that I visited the empty space to experience, at first

hand, the visual texture of its denuded bookshelves and unoccupied tables in the odd, hushed atmosphere of a protracted state of momentous historical closure. Although this is partly true, my visit was also motivated by the preexisting idea of linking the two sites under the common signs of storage and distribution. I can trace one of the idea's roots to youthful memories of attending prominent rock concerts in the Roundhouse's cavernous space and to the derelict site's transformation through the amplified sounds and visual grain of an efflorescent counterculture. This memory coloured my visit to the Reading Room with the emptiness and deracinated experience of a key historical site left to drift in the crosswinds of history but also of its possible recuperation, in another context, in the name of revolutionary change and the future. Hence, I felt, as I entered the Circular Reading Room, that I was looking, listening, and moving through a potent liminal space that was already situated in the future/past. (One must also not forget that the Reading Room's bookshelves were also empty shortly after it was constructed.) Thus it was under the sign of the future/past and its new uchronic possibilities that the Roundhouse fused with the Circular Reading Room's functions in a way that opened both to the possibilities of new visual forms and distribution networks, and in particular to those forms and networks most closely associated with the transformation of print-based knowledge in a digital age. [5] But this fusion was made possible because it took place through the operations of a powerful visual metaphor that was designed to traffic people and ideas between different spaces and times. For the Roundhouse is not only a key fixture in my imaginary, it served as a storage shed for locomotives which I have used -- because of their cultural significance, symbolism and their abilities to operate on the spaces and times -- in miniature form in artworks, installations, and performances that function as media archives and parallel uchronic sites. Moreover, inasmuch as locomotives, along with photography, belong to Adams' group of im/possible technologies of transportation and communication, The Encoded Eye is, in this same im/possible sense, also the locomotive's imaginary matrix as well as an actual turntable linking history to autobiography and vice versa.

It is worth emphasizing yet again the significance of Adams' phrase because of the way that it points to a relational -- and through it to an interconnected (intersystemic or networked) -- history of representation where different technologies and systems of representation are not treated in isolation but, in Adams' sense, as im/possible conjunctions in relation to aspectator's (and reader's) historically attuned imagination. It seems to me that we will always remain the victims of a Benthamian panoptically governed history of representation so long as we continue to compartmentalize media (photography, film, television, video, virtual reality) and, moreover, continue to insist on separating imaging technologies from their products. The question is, or it should: How does one dissolve inherited disciplinary boundaries in a way that foregrounds the tension between im/possible histories? The correspondences between the Roundhouse and Circular Reading Room allowed me to address this question inthe context of the Internet and CD-ROM formats.

The choice of a new transgeographical context for these nineteenth century architectural sites was important because it allowed me to exploit the placeless character of the Internet and the fact that it resembles the nineteenth century library both in its archival range and translocational character. In this connection, I think that Foucault's heterotopian definition of the nineteenth century library captures with great acuity the paradoxical sense of this institution's peculiar placelessness. [6] Inasmuch as the Internet now functions as a kind of infinite archive of information, this new communications medium is the natural heir to the library, just as the computer is the natural, if awkward, heir to the book insofar as each computer terminal is a kind of page-like surface and point of Internet access. The Internet also allowed me to turn the

traditional library inside out so that the it would exist inside the page as opposed to functioning as the latter's transcendent architectural container.

Finally, The Encoded Eye was designed to operate as a heterotopian and heterochronic threshold between print and digital cultures in a way that is exemplified by a specific photograph attributed to Fox Talbot. This undated Talbotype is part of a series of images of an engineering model of a steam locomotive that were probably produced in the early 1840s. It is therefore one of first, if not the first photographic image of a locomotive -- but, significantly, it is the photograph of a model. The model's image sits uneasily in its new photochemical environment just as the environment itself appears to be the nervous host of this strange emergent form. The fusion of two new communication and transportation technologies reinforces the impression that the permanently emergent model (it is afterall fixed in its own time and space) has moved through space and time encased in its photochemical medium with the insularity and enigma of a spaceship -- that gravity defying double of Foucault's exemplary placeless place: the ship. The image was initially transformed into a wireframe object by David Bergevin, The Encoded Eye's engineer, for an earlier web site entitled Wind Tunnel (1996-97). [IMAGE NO.1] This work -- which is also integrated as a reference and archive in The Encoded Eye -- was specifically designed to function as a three-dimensional digital archive and archaeological site that reflexively linked visual and acoustic elements from the early histories of photography, steam locomotion, telephone communication, with phonographic and virtual reality technologies in such a way as to allow a viewer to actively explore the site's communication and transportation infrastructures to their ultimate foundations in its wireframe construction. The site was also composed of a network of different media inasmuch as it coupled traditional drawing with digital imaging and sound imaging technologies.

I began to work on The Encoded Eye project through my association with Difference Engine, a British electronic journal. The journal had republished an article that explored the relationship between railway locomotion and virtual reality (it figures in edited form as one of The Encoded Eye's chapters). Difference Engine had also hosted Wind Tunnel. Lachlan Brown, the journal's founding editor, was interested in the whole problem of web publication and distribution and was looking for other projects, in particular booklength projects, for an expanded version of his journal. In the aftermath of Wind Tunnel's design I was looking for an opportunity to explore in more detail the im/possibilities of virtual intermedia linkage in the context of an uchronic history of imaging systems that could be deployed in a VRML space.

The Circular Storage/Archive Site as Cultural and Design Metaphor

A principal objective of "The Encoded Eye, the Archive, and its Engine House" was to explore the various cultural facets and visual dimensions of a key design matrix of modernity: A circular, integrated, and centralized storage and distribution site organized as a sequence of berths or tables that radiate from a kind of central turntable. A further aim of the project was, as I have suggested, to bring the earlier architectural forms of the Camden Roundhouse and the Circular Reading Room in contact with the new digital spaces and architectural possibilities of the Internet in a way that might eventually raise alternative historical and aesthetic questions about the latter. The Encoded Eye's design was a direct outcome of the possibilities suggested by this contact.

The Encoded Eye was conceived as a storage and distribution site for electronic configurations of knowledge that operate in counterpoint to patterns of knowledge that were previously circulated in book form in a print culture. The site explored the similarities between the Roundhouse and Reading Room while transforming them so that they might function as key references and interfaces with new imaging and communication technologies that are beginning to transform the nature of academic research and the storage, retrieval, and distribution of print-based knowledge. Again, it is important to emphasize that the site was crafted to operate between historical references and that these were situated in the present and not in the past. Moreover, the tension between the site's autobiographical, academic, and aesthetic dimensions ensured that the references and interfaces also functioned, in keeping with the site's three-dimensional form, as a kind of narrative and disciplinary turntable.

Although the Roundhouse and Reading Room are similar in form, their amalgamation was not obvious. Designing in relation to existing architectural sites posed particular problems related to scale, authenticity, architectural integrity and integration, especially when possible solutions were measured against the project's theoretical parameters and the site's position in a new kind of space gestating in its own novel possibilities. An articulated design process was adopted where the solution to one set of problems would provide a context for a new set of problems and their solutions, and so on. Actual measurements and recent architectural plans (in the case of the Roundhouse) and historical information on the Reading Room's critical dimensions provided a means of solving the problems of scale (both sites are full-scale), authenticity, and architectural integrity. However, since the objective of the project was not to construct a realistic model of a historical site but, on the contrary, to design a different type of storage and distribution site, these initial solutions were subject, especially in the case of the Reading Room, to adjustment in the context of other problems. Four key stages in The Encoded Eye's design were isolated in relation to the project's choice of references and objectives: access, the meta-architecture of the integrated site, deployment of the chapters, and, finally, the linkage between the two major architectural components, the chapters, and the illustrations. Since the objective of the present communicationis to present an overview of the project, I will simply itemize the solutions with the reasons why they were adopted.

i) Access: The interface logic between a potential reader and the site was based on the steps that a reader had to go through to get a book in the Circular Reading Room. The interface consists of seven diagrams based on a modified official Plan of the Round Reading Room which was available to visitors and readers. Each of the diagrams has a number of buttons that allows for forward or return movement. The first diagram has a button marked 'introduction' and another marked 'return.' The position of the 'introduction' button corresponds to the place in the Reading Room where one could get copies of its plan and other information leaflets. Clicking on this button brings a reader to the site's introduction which is build around the Reading Room's centre desk which serves as another button. After reading the introduction a potential reader can click on this button which will bring her or him to a third diagram which has three buttons (plus the ubiquitous 'return' button). These are labelled 'on-line catalogues.' Clicking on any one of these buttons will bring the reader to a fourth diagram with a button marked 'application for the book.' Activating this button will trigger an animation of another diagram with the label 'book delivery service.' If the reader clicks on this diagram he or she will be presented with a sixth diagram with the labels 'engine house' and 'book chapter' (reproduced three times). Clicking on the'engine house' button will bring the reader to the Roundhouse portion of the site and clicking on the 'book chapter' buttons will trigger an additional step in the interface. In this case,the previous diagram is eclipsed leaving the chapter labels floating inspace without their

corresponding buttons. However, the 'return' and 'engine house' labels retain their corresponding buttons which are active.

The extended interface was adopted for two reasons. First, in order to reproduce a similar (but not necessarily identical) sequence of events that corresponded to the steps that one might have to go through in order to obtain a book in the Circular Reading Room. The sequence was developed inorder to create a tension between the spatial, temporal, and institutional dimensions of the original site and a completely different kind of screen-based experience. In this sense, a reader is continously, if not always consciously, brought back to an experience that was translated into a facsimile -- like an image in a photograph or the plan of a room. Here there was no question of reproducing a purely on-line experience but rather there was an attempt to position the reader between two worlds, the one more orless physical (but now non-existent) and the other more or less virtual (but entirely present). Second, the use of diagrams produced a two dimensional experience which duplicated a computer screen's two dimensional surface while simultaneously creating a certain distance through a reference to drawings and diagrams that had been used in designing the interface in the first place.

ii) Architecture of the site: The basic problem in designing the site's principal architectural structure was to find a solution that preserved the integrity of the site's two architectural components in the context of a structure that linked the two together in terms of a common logic, while nevertheless allowing for a certain amount of changes to be introduced to the two elements in keeping with the site's objectives and virtual environment.

Initially, it was decided to preserve the original dimensions of the Roundhouse and Circular Reading Room. Since these dimensions were tolerably close, any links and interfaces between the two produced an additional mirroring between virtual and non-virtual environments. Moreover, the Roundhouse was depicted in terms of an 'old world' realism while the Reading Room was treated in a more experimental fashion (see below) thus highlighting the similarities and differences between two worlds and models of the world. Almost immediately, a solution was adopted which placed the Roundhouse on top of the Reading Room (which was inverted thus allowing aninterface to be automatically created between the two ground-plans).[IMAGE NO.2] The solution also allowed for the efficient and compact circulation of artifacts (locomotives--chapters) from the former to the latter. This solution presented itself as the one that would best respect a certain temporal logic (the Roundhouse was build before the Reading Room) and the spatial logic (interface between the ground-plans plus locomotives associated with the Roundhouse could be used to produce, through transposition and translation, a new kind of reading experience which was tied to virtual architectural sites as opposed to real sites or books). It also allowed for one site (the Roundhouse) to be treated as a storage site while the other became a kind of distribution site thus 'redistributing' design functions in the new virtual complex. The two architectural components were linked by way of a railway line in the shape of a mobius strip which allowed for animated locomotives to move between the inverted sites.

Cloned versions of the Talbot engineering model provide the animated linkage between the Roundhouse, Circular Reading Room, and The Encoded Eye's three chapters. [IMAGE NO.3] These identical translucent green avatars operate in a new electronic space that is their uneasy host not only because these strange enigmatic visitors are from an earlier time and space but also because the new space has been designed to serve as a gestational medium for novel

images and relationships that might not normally include nineteenth century locomotives except under the guise of nostalgia or historical reconstruction.

Finally, since the Circular Reading Room was denuded of books -- its original inhabitants -- it was treated as a new kind of reading room where the bookshelves were replaced by a rotating circular surface that carried the site's underlying code thus creating the possibility for a new kind of reading experience while preserving a space for an older type of reading experience that was rooted in the contents of each of the chapters. This strategy was also adopted for the locomotives. Each of the locomotives contains a rotating code-inscribed cylinder. A reader can eventually uncover one of these rotating cylinders by penetrating a locomotive's surface and discover that they provide a direct link to a floating architectural site (each one is different) that is also situated in a large rotating code-inscribed cylinder. (The cylinder and site serve as a context for the chapter illustrations.) This discovery leads to the realization that the locomotive's rotating cylinders are, in fact, the same rotating cylinders that are the hosts for the illustrations and their architectural settings, thus collapsing the loop between locomotive, illustrations, and the former's underlying software codes.

These solutions allowed for the construction of a virtual architectural complex that was, in keeping with the project's practical and theoretical parameters, delicately balanced between periods, structures, artifacts, and experiences.

iii) Contents and Deployment of the Chapters: The print-based facets of the site consist of three chapters plus an introduction. The chapters were chosen specifically for their common reference to the locomotive. This reference functioned as an autobiographical and analytical interface with the site's architecture, while the common storage and distribution logic became the key reference for the chapters' deployment. One of the chapters focussed on family photographs that related in one way or another to Magritte's La Duree Poignardee (1936). Another chapterfocussed on early trainspotting activities and its extensions into films such as Chris Marker's Sans Soleil(1982), Wim Wender's Tokyo-Ga(1985) and Andrei Konchalovsky's Runaway Train (1985). A third chapter explored the theoretical implications of linking virtual reality to steam locomotion. I felt that there was an opportunity, through the linkage of architectural form, a common storage and distribution logic, and thematically tailored chapters, to create an unusual archive and actually situate it at the threshold of print and digital cultures.

However, in keeping with the site's architectural references and the design possibilities of VRML-based environments, the chapters do not function linearly. There is no progressive sequence between a first and final or concluding chapter. Instead, the chapters are deployed in a circular matrix based on an amalgamation of the two given architectural sites and can thus be accessed in any order as simultaneously linked and yet distinctly autonomous textual entities.

The spatial deployment of the chapters was linked to an overlay of three engineering ground plans (1848, 1853, 1856) of the Camden Engine House with it's engine berths, the Circular Reading Room with its Reader's tables, and an original sketch by Antonio Panizzi, dated April 18th, 1852, which now only exists as a facsimile. Although the Camden Engine House originally housed 23 engine bays and one entrance/exit and the Circular Reading Room contained 35 readers' tables and one principal entrance/exit, The Encoded Eye only includes

three engine berths/tables/chapters. Their number and deployment were deduced by drawing a correspondence between appropriate berths and desks in each architectural site and the placement of three similar but unidentified elements in the Panizzi sketch. The overlay between the three types of drawings allowed for the position of the three chapters to be determined on the basis of a common logic that linked each of the architectural components to an initial idea in the shape of a lost sketch which now only exists as a copy.

iv) The Deployment and Architecture of the llustrations: Deployment of the illustrations presented a particularly sensitive design problem because of their intimate links to each chapter and yet their indivdual statuses as independent visual elements. How was one to juxtapose text and illustrations in a logical manner while still retaining ties to the conventional book and the possibilities presented by the new environment and its virtual architectural complex? The problem was to find a way to link the illustrations with the basic logic of the complex in a manner that respected its overall historical, cultural, and technological parameters.

The irregular movements of what could be interpreted as a hypothetical first Reader in the original Panizzi sketch provided a solution that effectively linked the various dimensions of the complex to the fiction and utopia of a virtual two-dimensional presence, the movements of which were was registered in the form of an intermittent, irregular graphic line. The discontinuous nature of the lines also complicated the idea of a coherent movement suggesting that this type of experience might only be possible in a new kind of space. In this sense a twenty-first century reader is again balanced between the visible and invisible, the possible and the impossible. Finally, each change of direction was interpreted as this first virtual Reader's response to an interesting event which was defined, in this case, as the presence of an illustration. Here the virtual complex's various dimensions were extruded, as it were, through the fiction of an original Reader's hypothetical movements in the utopian two-dimensional space of a sketch for a singular placeless place -- a library, but not just any library: the Circular Reading Room of the British Museum.

The illustrations were situated in three different architectural settings. Each one was associated with a given chapter. [IMAGES 4,5,6] These settings were designed on the basis of a complex set of references mediated by transparent overlays between contemporary illustrations (1846-47, 1848) and the Camden Engine House's three engineering ground plans (1848, 1853, and 1856). The illustrations were deployed in the two-dimensional inbetween space of these visual references -- a space that, paradoxically, could only exist in a three-dimensional form.

While each floating architectural site is different, the illustrations from the chapters are all present. However, the set of illustrations that relate to another chapter are not activated. Thus one is confronted with active and inactive illustrations, the former allowing for a passage

between text and image and between both ofthem and duplicate illustrations that are displayed in a given VRMLspace.

Clicking on the title of each chapter eclipses its text with the exception of individual words that are the links to particular illustrations. This choice provides the reader with two alternative reading experiences. The first is conventional and content driven. This method of presentation is juxtaposed with another means of accessing the text as a string of words that appear in a small window at the bottom of the screen. In this case, there is no link between text and illustrations. The second choice transforms words into a type of concrete poem since they remain in the same place that they occupy in the text. The minimal nature of this kind of reading experience is emphasized by the fact that each isolated word is linked to a particular image as opposed to an illustration since the context that defines the illustrative function of an image is eliminated. Thus chapter content is translated into a predominantly visual set of relationships between the illustrations embedded in the text and their doubles which are deployed in a VRML spacein the rotating cylinders. The question of relationship is highlighted by the various arbitrary associations that are possible between images.

Although a reader can proceed systematically through the site and has access to various camera positions that provide fixed viewpoints, there is, at all stages in a reader's engagement with The Encoded Eye, the possibility of alternative or deviant readings. It is simply a question of moving off the railway line, so to speak, or of moving off the chart that is ultimately presented by the site map. Tangential readings can uncover some of the site's odd, unforeseen, or secret elements, sites, or effects.

Finally, I have implied that a reading experience is solely the product of an individual interaction with the site. However, since the site can exist in different forms that are nevertheless tied to the computer terminal, there are a number of other possible relationships between a reader and The Encoded Eye. It can, for example, be viewed in isolation -- like an individual book -- or as an installation composed of a minimum of two terminals linked to LCD projectors.

In the latter case, reading experiences are rendered public -- as is the case of a new form of public library -- and a spectator can plot the progress of two or more readers as they engage with The Encoded Eye simultaneously but in terms of individual reading experiences. This form of presentation transforms The Encoded Eye into a three-dimensional installation thus highlighting its relationship to and roots in text-based installations and performed installations. [7] Thus, although The Encoded Eye was conceived as a threshold environment between the traditional book and the new screen-based archive of the computer, its references, parameters,and modes of presentation place it in an indeterminate space between thebook, the computer, and text and performance-based art installations.

Conclusion

The new meta-architectural site provides a navigator/reader with a different kind of reading experience that nevertheless interfaces with o rreferences traditional print experiences. It does so by structuring the navigator/reader's experience according to the common, integrated storage and distribution logic upon which both the Circular Reading Room and the Roundhouse were founded. On the one hand, there is an amalgamation and integration of the architectural, cultural, and communicative functions of both architectural sites in a way that provides a

historically resonant interface between old and new forms of archive, old and new methods of configuring, storing, and distributing print-based knowledge. On the other hand, the site provides the interface and passageway between the two models that have been sufficiently modified to take account of each other's historical similarities and peculiarities. However, since such an experience can only be simulated in a VRML-type spaceand is, moreover, a product of this space, this experience is as much an artifact of the new communications and distribution logic of the Internet and its VRML and hypermedia logics. Thus The Encoded Eye becomes a chimera conjured up through the machination of a new type of engine house: a digital enginehouse.

References

1. For previous discussions of this approach see David Tomas, 'From the Photograph to Postphotographic Practice,' originally published in SubStance, No. 55, 1988, and republished in Timothy Druckrey (ed.) Electronic Culture: Technology and Visual Representation New York: Aperture, 1996 and 'Toward a New Laboratory of the Senses and Model of the Human/ machine Interface,'Interfaces et sensorialite, Louise Poissant (ed.), Montreal: Les Presses de l 'Universite du Quebec a Montreal, (forthcoming).

2. Henry Adams, 'A Law of Acceleration (1904),' in The Education of Henry Adams: An Autobiography, Boston and New York: Houghton Mifflin, 1927, p. 494.

3. For a discussion of the social and political background to Vertov's work and its relationship to postrevolutionary Russian culture see Annette Michelson Kino-Eye: The Writings of Dziga Vertov, trans. Kevin O'Brien, London and Sydney: Pluto Press, 1984, p. xv-lxi and Stephen Crofts and Olivia Rose 'An Essay Towards Man with a Movie Camera' Screen, 18-1, 1977, pp. 9-58. For various discussions of the revolutionary nature of this film see Vlada Petric, Constructivism in Film: The Man with the Movie Camera, Cambridge: Cambridge University Press, 1987; Annette Michelson '"The Man with the Movie Camera:" From Magician to Epistemologist,' Artforum, 10-7, 1972,pp. 60-72, and David Tomas, 'Manufacturing Vision: Kino-Eye, The Man with a Movie Camera, and the Perceptual reconstruction of Social Identity.' in Visualizing Theory: Selected Essays from V.A.R. 1990-1994, Lucien Taylor ed., Routledge: New York & London, 1994, pp. 271-286.

4. It is worth noting the similarities between the Circular Engine-House,the Circular Reading Room, and Jeremy Bentham's late eighteenth century proposal for a prison to 'store' deviant human beings. For a discussion of the significance of Bentham's 'Panopticon' design see Michel Foucault, Discipline and Punish: the Birth of the Prison, trans. Alan Sheridan, New York: Vintage Books, 1979, p. 200-210.

5. Uchronia is word that identifies works that deal with eccentric or virtual histories and the possibilities they embody. It is based on the nineteenth century French word uchronie: a philosophical term that refers to the historical reconstruction of fictive events on the basis of given historical referents.

6. For a general discussion of heterotopias see Michel Foucault, 'Of Other Spaces,' Diacritics, 16-1, 1986,pp. 22-27.

7. The Encoded Eye contains a small archive of installations and performed installations that

can be accessed through the link 'work' in the chapter entitled 'Thresholds of Identity.'

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