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Deeper into the Machine: Learning to Speak Digital

Composition Studies has already made impressive advances in meeting the challenges posed by electronic textuality, including the introduction of computers into writing classrooms, employment of MOO spaces and other network environments in writing instruction, development of intelligent software to aid in writing, and increasing incorporation of visual rhetoric in the practice and criticism of writing instruction. Further change is needed to take full advantage of the rich multimedia capabilities offered by contemporary reading and writing practices. The move toward visual rhetoric is a welcome addition to the canon of traditional verbal strategies, but images are only one component among several new additions to the repertoire of electronic writing. To help our students learn to write effectively in digital media, we need to develop modes of critical attention responsive to the full range of semiotic components that can be used as signifying elements in electronic work, including animation, sound, graphics, screen design, and navigational functionalities. In effect, we must learn to speak digital.

One way to develop this critical competence is to track the changes literature is undergoing as it moves into the computer. By closely analyzing works of electronic literature, especially those that reflect upon as well as embody rhetorical practices specific to digital domains, we can gain insight into the possibilities of electronic writing and mobilize them as resources to chart new directions for the field of computers and composition. The past few years have seen rapid development in electronic literature as it has moved beyond the print-based assumptions characteristic of first-generation texts

into second-generation works that increasingly exploit the capabilities offered by digital environments. Media can be thought of as collective intelligences that explore their conditions of possibility by trying to discover what they are good for. These attempts in turn feed back into technological innovation to transform their conditions of possibility. Film learns that it can use shadow and light to create images resonant with emotional significance and meaning; this heightened sensitivity to gray tones is succeeded by the plunge into color, where the expanded palette allows for still more extensive use of the visible spectrum as a reservoir of signifying practices. Riding on the coattails of software developers, electronic literature has seen its conditions of possibility dramatically transformed since its inception.

So rapid has been the development that one can speak, as I do above, of two generations of works. Dating the watershed between the generations is a matter of critical debate, but most people agree it falls somewhere between 1995 and 1997. First generation works, often written in Storyspace or Hypercard, are largely or exclusively text-based with navigation systems mostly confined to moving from one block of text to another. Second generation works, authored in a wide variety of software including Director, Flash, Shockwave and xml, are fully multimedia, employ a rich variety of interfaces, and have sophisticated navigation systems. The trajectory traced by developments subsequent to 1997 can be broadly characterized as moving deeper into the machine. Increasingly electronic literature devises artistic strategies to create effects specific to electronic environments.

This specificity can be explored through a series of works that construct the relation between machine, work and user to discover what it means to write, read, and

inhabit a coded medium. The first work I will discuss is *database*, an installation created by Adriana de Souze e Silva and Fabian Winkler and exhibited at the Electronic Literature Organization's "Symposium: State of the Arts" in Los Angeles in April, 2002.[1] Database interrogates the assumptions embedded in the interfaces of screen, printer and projector by inverting them, a process that brings them into visibility for the viewer and invites meditation on the presuppositions they instantiate.

The second set of works interrogates how interfaces and the machines that process them construct subjectivity. Particularly important for these works is the realization that natural and machine languages mingle in the production of electronic literature. While the user parses words, the machine reads code. These works are not content to let code remain below the surface but rather show it erupting through the surface of the screen to challenge the hegemony of alphabetic language. Talan Memmott's "*Trans*lucidit*y*" and MEZ's "mezangelled" productions push toward the creation of a creole comprised of English and code. These works draw on the literary tradition and programming protocols to ask what it means for contemporary users to be constructed by both. What kinds of subjects are spoken by this creole? What kinds of subjectivities are implied by the interfaces created by these works, and what is their relation to the machines that write them?

Another way to push deeper into the machine is to construct the screen as a world the user is invited to enter. "The Many Voices of St. Caterina of Pedemont" by Alison Walker and Silvia Rigon illustrates how the creation of a world in electronic environments differs from the verbally constructed worlds of print literature.[2] This work employs animation, sound, graphics, and navigation as semiotic components working

together with words to create multiple interpretive layers focusing on the spiritual practices of a fictional medieval mystic, Saint Caterina. As the different voices offer varying perspectives, the user is immersed in a richly imaged and layered topography where the church hierarchy, academic scholars, the mass of believers, and the female saint contest for the meaning and significance of her mystical experiences. In M.D. Coverley's electronic novel, *The Book of Going Forth by Day*, the inscription technology producing the fictional world is foregrounded as part of the meaning.[3] Navigation here does more than offer access to the work, becoming an important part of the work's signifying structure and creating meaning through the functionalities it offers to the user.

As critics and theorists encounter these works, they discover that the established vocabulary of print criticism is not adequate to describe and analyze them. The language that electronic literature is creating requires a new critical language as well, one that recognizes the specificity of the digital medium as it is instantiated in the signifying practices of these works. This new critical vocabulary will recognize the interplay of natural language with machine code; it will not stay only at the screen but will consider as well the processes generating that surface; it will understand that interplays between words and images are essential to the work's meaning; it will further realize that navigation, animation and other digital effects are not neutral devices but designed practices that enter deeply into the work's structures; it will eschew the print-centric assumption that a literary work is an abstract verbal construction and focus on the materiality of the medium; and it will toss aside the presupposition that the work of creation is separate from the work of production and evaluate the work's quality from an integrated perspective that sees creation and production as inextricably entwined.

This is, of course, a tall order. Nothing less than forging a new critical vocabulary, however, will suffice to account for the new languages that contemporary electronic literature is creating. Critics must follow writers deeper into the machine, learning as we go the idioms that emerge when humans collaborate with intelligent machines to create the literature of the twenty-first century.

Interrogating the Interface

~~Database~~ plays with the idea the materiality of technology should be thrust into visibility as a way to bring into consciousness assumptions that we normally take for granted. It undertakes this enterprise by reversing and subverting the technology's usual operations.   The installation consists of a computer screen displaying virtual text, a printer with a miniature video camera attached, and a projection displaying the camera's output.   Sitting in the printer are sheets of paper full of text, the exterior database for the project. When the user moves the cursor over the white computer screen, black rectangles appear that cover over most of the text, along with keywords that fade into white again when the cursor moves away—unless the user chooses to click, in which case the keyword is also covered by a black rectangle. At the same time, the click sends a message to the camera to focus on a second keyword in the exterior database related to the first through agonistic relation, perhaps an antonym or other oppositional tension. For example, clicking on "perpetually" on the screen makes "too fast" appear on the wall projection; the screenic "promise" links to the projected "past." After a few clicks, the screen is dotted with black rectangles. The user can then click on a red dot at the upper right corner to activate a "print" command. The printer sends through the sheet full of

pre-written text, blacking out the keywords chosen by the user as the camera gives a fleeting glimpse of them before they disappear. The obliterations create alterations in the database's text that change its meaning, so the database the user reads as it emerges from the printer is not the same as it was when seen on screen.

Souza and Winkler's artist's statement makes clear the project's complexity. Inversions operate throughout the apparatus to challenge conventional assumptions. The printer obliterates rather than inscribes words; the database is stored as marks on paper rather than binary code inside the computer; clicking blacks out visible words rather than stabilizing them; the camera "reads" but does not record; and the projection displays words oppositional to the ones the user has chosen.   The inversions create new sensory, physical, and metaphysical relationships between the interactor and the database. Printing, a technique normally associated with creating external memory storage, here transforms a mark into an obliteration. The video camera, usually linked with storage technologies that make a permanent record, here makes writing ephemeral and transitory, disappearing from the projection as the word is inked out. The database, rather than residing at physically inaccessible sites as bit strings dispersed throughout the hard drive, is here constituted as linear text the user can literally hold in her hands.

These inversions recall the distinction Lev Manovich makes between narrative and database in his pioneering *The Language of New Media*.[4] While narrative is the dominant form of print literature, Manovich argues, database is the native idiom of the computer. He notes that database inverts the relation between the syntagmatic and paradigmatic that obtains with print text. For print the syntagmatic, inhering in the order of the sentence, is visibly present on the page, whereas the paradigmatic, inhering in

alternatives that could be substituted for a given word, is virtual, imaginable as a conceptual possibility but not physically realized.   With a database, however, the possible choices are physically present as encoded data, whereas the syntagmatic order created by their assembly is virtual, a possibility that can be realized only when the appropriate commands are executed.

This inversion of the syntagmatic and paradigmatic is playfully referenced by *database*'s pre-printed sheet, which serves as an actual paradigmatic array and also an emergent narrative created on the fly by the printer's obliterations overwriting some of the inscriptions. The significance of these inversions is broadened by the prose constituting the database, selected from various writers meditating on time and memory, including Borges's "The Immortals." In this fiction, the narrator is searching for the City of Immortals. He discovers a tribe of troglodytes, seemingly subhuman creatures that cannot speak, do not sleep, and eat barely enough to keep alive. The narrator decides to teach one of them to speak, only to discover that the creature is the poet Homer. Following Borges's logic, Souza and Winkler point out that immortality drastically alters one's relationship to time. Since time for an immortal stretches in an endless horizon, the future ceases to have meaning; the future is precious for mortals because they understand their lives have finite horizons.   The immortals, by contrast, live in a present that obliterates the past and devours the future, becoming absolute, permanent, and infinite. Saturated by memories stretching into infinity, the immortals become incapable of action, paralyzed by thoughts that have accumulated through eons without erasure. Seen in light of this story, the obliterations the printer creates can be read as inscriptions of mortality,

non-signifying marks that paradoxically signify the ability to forget, a capability the immortals do not have.

Just as the printer plays with time by linking inscribing/obliterating with immortality/mortality, so the wall projection plays with time by linking writing/speaking with visibility/invisibility. The words projected on the wall function as visible inscriptions, but inscriptions that behave like speaking since they disappear as the printer inks out the selected word. Writing, a technology invented to preserve speech from temporal decay, here is made to instantiate the very ephemerality it was designed to resist. The interactor's relation to this writing is reconfigured to require the same mode of attention one normally gives to speech. If one's thoughts wander and attention lapses while listening to someone speak, it is impossible to go back and recover what was lost, in contrast to rereading a passage in a book. Moreover, the wall projection does not repeat the word the viewer selected on screen but rather substitutes another word orthogonally related to it. Blacked out as soon as the interactor clicks on it, the screen word became unavailable to visual inspection. The interactor can "remember" it only by attempting to triangulate on it using the projected word, which requires her to negotiate a relationship constructed by someone else through the fields of meaning contained in the database. But as soon as the interactor prints the database out, it is altered by the obliteration of the words she selected, which also changes the meaning of the narrative that provides the basis for the relationship between screenic and projected words. Thus the interactor is placed in the position of trying to negotiate meanings whose significances are changed by her attempt to understand them.

It is no accident that ~~database~~ positions its interventions at the points where words are transported from one medium to another. The functionalities that allow us to print out a screen or project it onto a vertical surface make it easy for us to forget the technological mediations that make these everyday activities possible, and more crucially to forget the embedded assumptions they instantiate. Screen text is not print, and a projected light image is not a scanning electron beam. The inscription technologies of screen, print and projection each has its own specificities, and each constructs the user in a distinctive sensory, cognitive, and material relation. What we dare not forget, ~~database~~ implies through its focus on remembering and forgetting, is that the technology is both a machine and an incarnation of assumptions embedded in its form and function. These assumptions interpenetrate the work, or better, commingle with it in a fusion that requires re-thinking the ideology that a literary work is an abstract immaterial entity. By bringing our assumptions into view through its subversions and inversions, ~~database~~ facilitates this creative revisioning.

Interfacing Subjectivity

In "The Data][H][Bleeding Texts," MEZ (Mary-Anne Breeze) gives an "Electroduction" to her "polysemic language/code system."[5] She calls the system "mezangelle," describing it as a way to extend the meaning of words and sentences "beyond the predicted or expected." Besides containing MEZ's pen name, "mezangelle" also suggests mangling, appropriate in its ordinary meaning as a process that deterritorializes and reterritorializes word fragments. "Mangle" also has a specialized programming meaning, referring to a process whereby a program associates

a file name longer than 8 bits, the maximum length a computer can store, with an arbitrary combinations of symbols 8 bits long. Thus a human can give a name like "Datableeding" to a file that will enable easy recall, and mangling mediates between this human-meaningful name and a bit string the computer can store. Mangling thus works as a translator between natural language and code.

The pun on mangling points toward the play on code and English that is at the heart of the mezangelle language system. Inserting "programming language-shards and operating system echoes" into English, MEZ works within the environments of email lists and chat rooms to create poem-like objects that display in their structure and syntax the interplay of human language and machine code. She thinks of the context for her works as an "environment x.clusively reliant" on software functionalities, and the works explore the significance of intermingling language and code for the fictional voices that speak within it. At first her pieces consisted of "mezangelled" text (along of course with the underlying code that formatted them for electronic environments). Recently, however, she has moved into creating "enhanced" works that include in addition to "mezangelled" text animation, graphics, and sound. She has also self-consciously begun reaching out to a wider audience, giving hints and explanations about how to read and comprehend her texts, a venture about which she nevertheless voices misgivings.

In "_Non Compos Mentis: Zen_Tripping the Non-Conference Circuitry_," a work included in her recent collection "_][ad][Dressed in a Skin C.ode," MEZ provides both the mezangelled and plaintext, so that the polysemy introduced by "mezangelling" can be easily seen.[6] A section entitled "_Back-and-Foregrounding_ "

in the plaintext descries the transformation of sensibility that occurs when the persona encounters the computer and is forever transformed.

> A Mezzian Flesh-Mote enters a library. In a networked sense this library is cold; binary data advancements are yet to make any perceivable impact on its manifest functions. A silvered sliver-glint pulls the Mezzian Mote forward to the only technoniche available—a computer laboratory, used primarily for word-processing tasks. It also has an Internet connection. A Datadervish [E-Mote] is born, and a Flesh-Mote is extinguished.

A tale of transformation, the story can only be told from a retrospective view (for it is only after the fact that the transformation can be recognized as such), and this angle of vision is reflected in the vocabulary. "E-mote" is a formation born of the Web, a verb transformed into a noun by the interjection of a dash that references the electronic ("E") world and the subjects who emerge from it. Through back-formation the subject prior to her electrification is named a "Flesh-mote," a word that already recognizes the individual will exist in a haze of networked others as soon as it transforms into an "E-mote." Pulled forward by the gleam of the screen, the Flesh-Mote finds the means of her transformation in the computer, primitive though this particular laboratory is.

> Now consider the "mezangelled" text, which compresses the plaintext and, paradoxically, through compression extends its implications.

> .a mezzian flesh-mote enters.

> .the libr][bin][ary is cold. a s[]l][i][ver glint pulls the mote 4wards.

> .4warding][ing of the datadervish][in2 the][comp][lab lair.

At first it appears that the prose of the plaintext has been converted into poetic lines, a transformation that brings into play the traditional poetic tension between the ending of one line and the beginning of another. However, in the programming language Perl the dot is a concatenation operator used to add strings together, so the lines now exist both as discrete units and additive lines, with the dot signaling division when read as a period ending a sentence, and addition when read as a concatenation operator preceding the string.   The second line, typical in its use of interjected square brackets, shows how mezangelling works. "Library" can be recovered as a word, but only after encountering "][bin][ary," the binary code still largely missing from this "cold" library. "Binary" is in a sense now hidden or found to be concealed within "library," a form of reading that anticipates the coming transformation of this institution as it creeps into the information age, a process already begun in its primitive word-processing laboratory. Read as operators, the brackets in this mezangelled word do not make sense, for there is no opening bracket for the initial right bracket, and no closing bracket for the final left bracket. Despite its violation of normal syntax, "][" has a polysemy that draws MEZ to it, for it resembles "I", the nomination of selfhood, and also "H", which by back-formation can often be read as "I" in her texts. Although the brackets can be broken apart, "][" often functions as a symbol in its own right. That the "bin" of binary should be surrounded by this symbol suggests the implication of the subject "I" in the discovery of the binary within the library, an association that the plaintext makes clear in other words.

The "silvered sliver-glint" of the plaintext is now compressed into a mezangelled word that folds "silvered" and "sliver" into one through the interjection of

brackets, a process that also twice creates the "][" symbol and so interjects the "Mezzian" of the plaintext into the middle of the word, so that now "mote" appears without the preceding adjective. "Forward" becomes "4wards," a word homophonically recoverable as the plaintext term but also visually contaminated by a number combined with an English syllable in a creole that signals the in-mixing of code with language. In the mezangelled text, the "Datadervish" is moved "4ward][ing" into a lab, a prescient anticipation of the transformation already encoded by the interjection of the "][" symbol into the motion of moving forward. "Computer laboratory" in the plaintext becomes][comp][lab lair," with the "][" symbol now surrounding "comp," emphasizing that the "I" and "computer" have now joined in a space that has also become a "lair," with the connotation of secrecy, protection, and most of all habitation.

The transformation, in the plaintext performed by the assertion that "A Datadervish [E-mote] is born, and a Flesh-mote is extinguished," is now dramatically enacted by a visual and verbal full stop, punningly performed by bolded dots and the word "stop."

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>>stop<<

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In older languages such as Basic, "stop" signaled the end of a routine. Here, however, it is not the program that ends but a certain kind of pre-electronic subjectivity. As was

the case with the square brackets, the angle brackets function both as visual patterns, here indicating emphasis, and allusions to code. In C++ they are used to designate extraction (>>) and insertion (<<) operators, commands that indicate the program should successively output or input the terms in a file until all the terms have been used. Read as operators, the brackets pointing right metaphorically indicate terms are being extracted (those comprising the subject as Flesh-mote), while the brackets pointing left indicate terms are being inserted (those of the E-mote). The dots above and below this process serve both as dividers and connectors (when read as concatenation operators), thus marking the splice from one kind of subjectivity to another.

In her brilliant analysis of MEZ's "code-wurk," Rita Raley demonstrates that the reading process is significantly altered with a mezangelled text, for the decoding that normally constitutes literary reading is here disrupted by visual signs that have no phonemic equivalent, for example the "][" symbol or a word like "libr][bin][ary."[7] This is a language that cannot be spoken in all its fullness. The historic evolution of a system of marks tied to oral articulation is disrupted and re-encoded as a system of mixed phonemes and code symbols that can be read and apprehended but not spoken. Thus "la langue" of Saussure and the generations of semioticians following him is displaced by a language system that can be fully understood only by a bilingual reader who knows both English and code. Spoken language cannot be the desired object of study, as it was for Saussure, who saw written language as derivative and secondary. It is not oral articulation but inscription that is central in this language system, and moreover inscriptions that go deep into the machine. As the code symbols continually remind us, the screen text is only the topmost part of the language system; underlying

the screen text are layers and layers of coding languages essential for producing the surface text. John Cayley calls for analysis of "a set of relationships—relationships constituted by artistic practice—between a new problematized linguistic materiality and represented materiality."[8] To read mezangelle is to encounter precisely what he means, for through her work we experience a world in which language is inextricably in-mixed with code and code with language, creating a creolized discourse in which the human subject is constituted through and by intelligent machines.

Talan Memmott shares with MEZ an interest in mingling code and English to create a creolized discourse. They differ, however, in their use of visual materials. Originally working only with text, MEZ tends to use visual images as illustrations for content, whereas for Memmott images are part of the content. Coming to electronic literature from a background as a painter, Memmott chooses to enact some concepts through screen design, animation and images rather than words. In addition, his work is more idiosyncratic than MEZ's, whose content, once decoded, tends not to be especially esoteric. The idiosyncrasy of Memmott's work can be understood as a large-scale project, stretching over many individual texts, that is designed to deconstruct traditional ideas of selfhood, representation, and affectional relationships by revealing their ideological bases. In this sense, to use one of his neologisms, the work is not merely idiosyncratic but ideosyncratic, an experiential art form meant to pry us from our received views by re-describing and re-presenting relationships and subjectivities in terms of a networked environment in which individual selves blend into a collectivity, human boundaries blur as people merge with technological apparatus, and cultural formations are reconfigured to reflect and embody a cyborgian

reality. This re-description, a deep re-visioning of what it means to be human, is ambiguously situated as a development dependent on information technology and as a truer apprehension of what the human condition has always been. Such an ambitious project is not without perils, of course, and at times the texts veer toward the Charybdis of incomprehensibility or the Scylla of sophomoric generalization. At their best, however, they are both playful and profound, challenging our visions of ourselves and presenting us with highly charged enactments of what we may be in the process of becoming.

The playfulness of the work is on display in "E_CEPHALOPEDIA‖NOVELLEX," a work in which a narrator finds a chalked figure on the sidewalk, as if a dead body has been outlined there.[9] The figure is missing its head, which has been swept away or obscured. The narrator finds himself unable to decide if it is the outline of Leonardo's famous drawing of the four-legged and four-armed man representing the "range and radiance" of human proportions, or Bataille's iconoclastic self-portrait showing him holding a dagger in one hand and his ripped-out heart in the other. Since the two images have little in common and indeed are ideological opposites—Leonardo's drawing embodying the ideal of "man as the measure of all things" and Bataille's image an attempt to pollute and fatally contaminate that vision—the narrator's confusion is ludicrous. On another level, however, it is significant, for inasmuch as the two images are one another's opposites, they both depend upon the same assumptions, one to instantiate them, the other to refute. "Leonardo becomes Bataille," the narrator suggests, "—learns a *lessen* from Batialle. **There was a struggle**." The lesson/lessen pun effectively makes the point that the grand vision of Leonardo, with its implicit

generalizations about the human form and subject, is unconsciously imperialistic and must be made more specific, lessened, to retain validity.

The narrator pretends that he *would* be able to make the distinction between the Leonardo and Bataille images if only the head were not missing, another significant confusion since it suggests that without the head, the body cannot signify. Here the narrator's confusion subtly points to the insidious nature of a Cartesian view that identifies thinking solely with what happens in the head, making the body more or less superfluous to cognition. "One must RE:member," the narrator comments punningly on a screen in which the radiant Leonardo head appears with a bifurcated arrow pointing toward the headless Leonardo body. On another screen, "The [Organ|Engin]eer tries to do his best. . . He thinks, we think Beyond what is," and the bifurcated arrow again points to an enlarged image of the Leonardo head. A bolded command reads, "[</HEAD >@FRONT], " a non-syntactic combination of html coding for "head" followed by a MOO command for location, suggesting again the Cartesian primacy of the head. Following is a screen showing the head floating above the body with the bolded tag "[<HEAD>@BODY]," another non-syntactic combination suggesting that the head should after all be included in the description of the body (@ is a command in many MOO environments that allows the user to input a physical description indicating how she wishes to be "seen" by other users).

In "*Trans*lucidity," this kind of language-image play is extended to (re)describe the process whereby identity can become "adentity," a form of subjectivity in which the individual escapes from the genetic and psychological encoding of the nuclear family to join an electronic collectivity.[10] Translucidity is contrasted with transparency, which

the work punningly interprets as the parenting process in which [par1] and [par2] in a "plural act of rendering" create the "3rd face," the child who must break away from the "couplings and collusive partnerships" that would keep him trapped within a model of individualistic selfhood reproduced in turn through his acts of (trans)parenting. In comparison, in translucidity "The 3rd is always other as it is I," suggesting that individuality is an illusion, a mystification of the social and cultural processes that make every I a We. In contrast, translucidity would locate the face, signifier of selfhood, at the "outside of an inside that allows for self observation as self-examination, a testing and playing with identity as adentity." Such a transformation is not envisioned without reservations. "We find warmth in this de.position of identity, entrusting it to an external repository that is accessible only through the attachment of some electronic device, needing an other for de.vice," the narrator comments. The "de.position" of identity both deconstructs and repositions the "I, which can only be we." Still, this collective I/We is not yet a complete "de.position," for also involved is the "I + device," which "[N]crusts the earth through hyperactive infofrenzy. . . the need to know . . . We exp[e|a]nd as we conduct—heat rises; global and lobal warming are sibling." The conjunction of the capitalistic forces that produce global warming with the "lobal" of the human brain indicates how inextricably mingled are the human and machine in the digital age. Whether the resulting "infofrenzy" will lead to amelioration or catastrophe is unclear; all that is certain is that it is the catalyst for unprecedented change.

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Throughout the work a frequent visual trope is the face, as if rendering literally the idea of the (inter)face as a connection between a face inside the machine with the

faces we wear outside the machine. Moreover, these faces are described as ambiguously located at once on the inside and outside, as if they are both looking out from the screen and reflecting our faces looking at the screen. In one image, we see a face—the only visual cue available for clicking—and when we click on it, smaller faces multiply across the screen in a visual enactment of (trans)parental reproduction. On another screen a face peeps through a clickable round window as if contained within a petri disk or microscope lens, the object or subject of an experiment. In yet another the face poses as an emblem of allure (alle.ure), seducing the visitor with the promise "I have what you want" and inviting us to register. If we accept the invitation by clicking, another screen opens with seductive eyes half-closed above boxes where we can respond to questions such as "who are you?" "where are you now?", "what do you want?" and "why are you (t)here?" The promise implicit in these questions is not intimacy but what Memmott calls "intertimacy," a meeting of subject and object--"[sub|ob]ject]"-- in the apparatus. "She, the apparatus is always Ariadne. . .," spinner of threads, weaver of webs, creating the connections that allow the transformation from one to "WE," "[com(mon)|ex][patr|p]iates." Expatriates who expatiate, comrades who are becoming common, this electronic collectivity will be formed not through technological mediation alone but also through art works such as this. With creolized language, transformed subjectivites, and visual/verbal/kinetic (inter)faces, this work images new kinds of faces appropriate to the posthuman subjects it (re)describes.

Sensing a World

In "The Many Voices of St. Caterina of Pedemonte," sound, animation, image and text are woven together to create a compelling sensory experience. Drawing on their research into the lives of medieval female saints, Alison Walker and Silvia Rigon have created "St. Caterina" as a fictional composite constructed to reveal the saint's subjectivity as a site for contestation between five different perspectives. These are actualized in the text as competing voices represented as articulated sound and screenic text; each voice is associated also with related visualizations. The opening screen shows an iconographic Valentine-red heart, with white rays going out to smaller red hearts serving as portals to the different sections. An important component of the work is its interactivity, designed to engage the user's emotional and psychological responses. Referencing Lev Manovich's observation that interactivity can be metaphorical as well as physical, they designed the interactivity to function as a "meta-commentary" reinforcing the work's significance.[11] Moreover, they aimed to craft the individual modalities— sound, sight, kinesthesia—so they would synergistically enhance each other.

Interactivity as meta-commentary can be seen in the rendering of the first voice, the "authorized" version of the Catholic Church, associated with a traditional iconographic rendering of the saint showing her heart pierced by rays emanating from above. When the user clicks on this stereotyped image, it changes to black and white with horizontal lines running across it, emphasizing its textuality and hence its constructedness. As a voice-over begins narrating the Church's version of Caterina's life, the corresponding written text scrolls over the image; only that portion outlined by the saint's body is legible, however, the rest obscured by the transecting lines. As a result,

the user can access the full text *only* by listening to the oral narration, a design choice that re-enacts the Church's mandate that it should act as mediator between the believer and God. The point returns in other guises as St. Caterina experiences a direct connection to God through her mystical experiences, a claim to immediacy the Church contests. In a subtle way tension is already present in the subordination of the user to the voice-over, a positioning that strategically lays the groundwork for the user to emphatize with Caterina as she struggles with a Church she both obeys and resists.

The second voice is the academic narrative of Rudolph Bell, whose research into the penitential practices of female saints links them with anorexia, an eating disorder with extremely debilitating effects on the body, up to and including death. This voice is accessed via another beatific image of a haloed saint. As the user clicks on the small red hearts at the corners of the image, text begins appearing that describes the primary and secondary effects of anorexia, including such medical symptoms as weakened internal organs and dysfunctional digestive tract. When the user clicks again on the small red hearts, they act as corners that can stretch away from the surface, partially revealing underneath a naked female body disturbing in its skeletal form and starvation-ravaged flesh. Whatever the spiritual benefits of fasting, this voice makes clear its physical cost and, by doing so, draws into question any simple evaluation of it as a spiritual practice.

The third voice is autobiographical, based on the fact that many female saints were ordered by their superiors to write their autobiographies, sometimes drawn out into years of writing and thousands of pages. These autobiographies represent both the writer's desire to articulate and justify her visions and the superior's command that she must write them, so that the text becomes a site of contestation between personal

narrative and penitential punishment. In addition, when one historical saint was ordered

by her superior to write her autobiography, her descriptions of her mystical raptures so

disturbed him that he ordered her to stop immediately, even though it was on his orders

that she began to write. St. Caterina's autobiography begins with the words, "They made

me lick the spiders from the walls," alluding to a penitential practice in which, according

to historical records, at least one woman was made to lick spiders as part of her

punishment for daring to claim a direct relation to God. Images for this screen include

spiders that flash over the surface, as if in frenetic imitation of a "Space Invaders" video

game. When the text of the autobiography appears it is illegible. Only when the user

clicks on the spiders with a cursor imaged as the word "lick" do the first couple of lines

clear enough to read. To continue the user must keep clicking on the spiders,

experiencing the text as a barrier that begrudges accessibility and yields only after the

user pays the proper penance.

The fourth voice, the most personal and hence the least communicable of all the

narratives, is represented in the text as body images. These are manifested not as

coherent human shapes but portions of flesh that have been mutated, stretched and

multiplied so that they allude to the body but cannot themselves be contained within the

bounds of a recognizable subject, slipping away into ecstatic visions that hint at the

unspeakable. Similar visions appear on other screens and function as a wall that the user

is unable to penetrate, alluding to a feeling frequently voiced by the female saints that

their bodies were prisons from which they could not escape, save by death. Feeling

themselves imprisoned within flesh and bones, some resolved to take as nourishment

only the Sacrament of Christ's body, determined to ingest only the food that, transformed

into flesh, would connect them to Christ's divine incarnation. Here functionality for the user—or rather non-functionality-- is figured as resistance. Just as the saints could not escape their bodies, so no amount of manipulation by the user will allow her to pass the image of that mortal coil.

The final voice is a straightforward oral narration that tells the passage of Caterina's heart from a body organ to a historical artifact. The screen is dominated by a pulsating anatomically correct heart that, beating in diastolic rhythm, transforms into the blasé red heart of traditional iconography. The alternation between romanticized image and medical accuracy creates an ironic tension that permeates as well the oral narration. The narrator tells us that when Caterina dies her body is ripped to shreds by believers seeking a souvenir. Her heart, torn from her chest, is preserved as a relic and enshrined in a church. The implicit irony continues the contestation that has been present throughout. Although the church is in the end successful in claiming ownership of Caterina's heart, its triumph is located within a web of cooperating and competing narratives that encourage the user to see the Church's authorized account as one story among many. In the layered structure of the work as a whole, the synergies created by its multiple sensory modalities tell a story too rich and complex to be reduced to any of its parts.

Embodying a World: *The Book of Going Forth By Day*

"Space" in literary theory and practice is frequently interpreted metaphorically as an imaginative grid upon which action can be mapped. For writers working with electronic literature, space acquires significantly different meanings. With graphics,

animation, and multiple layers at their disposal, writers configure the screenic surface to simulate three-dimensional spaces that present an illusion of depth and perform as interactive arenas. The importance of this development can scarcely be over-emphasized, for it creates possibilities for rich interactions between narrative content, software functionality, and screen display that become part of the electronic work's signifying practices.

Among the writers interested in exploring these possibilities is M. D. Coverley, author of two major electronic narratives, *Califia* (Eastgate Systems 2000) and *The Book of Going Forth by Day*, as well as a number of shorter pieces. Particularly important for Coverley is the relation between layered screenic spaces and deep layers of historical and geological time extending through generations, centuries, and even millennia. Visual representations of space on the screen, software functionality as navigation of space, and verbal accounts of movements through space and time become enmeshed in ways that tie together the narrative and the kinesthetic, the user's actions and the maker's design. As the user moves through screenic space she navigates through different narratives, with sites within the work correlating with different focalizations. As a result, the user does not merely read a narrative but enters a world, complete with sound, animation, verbal description and visual display.

After working five years on *Califia*, Coverley made the decision to make her next large work, *The Book on Going Forth by Day*, available on the Web as she continues to work on it. Although the work is still in progress, enough of the overall structure and design is now visible to make commentary feasible. *The Book of Going Forth By Day* has a tripartite narrative structure and a deep concern with connections between the

present and historical past. The entwining tropes for this work are word and image, particularly their union in Egyptian hieroglyphs. Instead of three different narrators, this work has three speaking voices located within the same central narrator, corresponding to the Egyptian idea of the tripartite soul. Jeanette, corresponding to the Ba soul that leaves the tomb to wander in the world, is the present-day narrator drawn to Egypt at the invitation of her brother Ross; Tjeniet (also the term for facience, the vivid blue used to surface materials in ancient Egypt), corresponding to the Ka soul that stays in the tomb to accept offerings, is a kind of alter-ego of Jeanette, surfacing in the emails Jeanette sends to her sister Nancy and articulating thoughts that she does not quite consciously grasp; and Isis, the Akh soul who travels in the Barque of Re and represents the eternal instantiated in Jeanette as one of her contemporary manifestations.

Going Forth is fully multimedia, including sound, animation, graphics and verbal text. Building on her accomplishments in *Califa*, Coverley in this work makes sophisticated use of animation, creating skies that roll, views that pan across the inscribed surfaces of a pyramid, and papyrus images that appear to unroll like a scroll. Steeped in Egyptian history, mythology, religion and art (the work is based on twenty years of research), Coverley imagines a work in which words count as images and images as words, time has two complementary dimensions of linear progression and eternal return, inscriptions are not merely tokens for words but powerful spells capable of deciding one's fate for eternity, and the individual subject merges into the archetypes of eternal gods and goddesses. Hypertext is well suited for this kind of exploration, for with its multilinear narration, multimedia capability and unmatched powers of simulation, it

enables the fluid combination of different textual elements and multiple possibilities for their combination and re-combination.

Modeled after the spatial arrangement of Egyptian hieroglyphs, the interface employs both horizontal and vertical registers. The horizontal panels narrate Jeanette's first-person adventures with (and without) Ross, in which she re-acts a dynamic of loss and recovery similar to Isis piecing together her murdered brother Osiris' body, although here it is not literally a reassembly of a dismembered body but a re-membering of events. The vertical panels are expository, giving linguistic, historical, and geographic information about ancient Egypt, modeled after the rubrics that in hieroglyphic texts give information on how to interpret the depicted events.

The correspondences between Egyptian hieroglyphs and the interface are much more than window-dressing. Rather, they suggest deep connections between inscription systems, cosmological beliefs, temporal orderings and geographic assumptions. Hieroglyphic inscriptions were written in all directions, including left to right, right to left, up to down, down to up, edging sideways into margins or spiraling in a circle, with the order of reading indicated by the direction the figures face. Early Egyptologists assumed this spatial promiscuity was dictated by convenience; since the extant hieroglyphs were incised into stone, writers took advantage of any available space regardless of its orientation. *Going Forth* suggests a different interpretation, relating the omni-directionality of the writing to ancient Egyptian beliefs about the "endless geometry" of the world, in which personages from the past continue over the threshold of death into the future, and gods and goddesses traveling in the barque of Re also manifest themselves in humans alive on the earth. One of the rubrics relates the discovery by

ancient Egyptians that the rising of the star Sirius corresponds with the flooding of the

Nile, thus enabling them to make connections between the movement of the heavens and

the rhythms of the earth and resulting in the concept of an annual cycle, which in turn led

to the temporal organization of the calendar into years. Thus the linear flow of time,

associated with the unidirectional flow of the Nile, was overlaid onto a topological

scheme cyclical in nature, corresponding both to the annual rising and falling of the Nile

and cycles of human life in which individuals were seen as reincarnations of eternal

deities.

Given such a cosmology, how would an inscription system be envisioned? The

answer, *Going Forth* implies, would be to envision the inscription surface as a complex

topology in which linear writing takes place within a larger geometry that permits

horizontal reversals, various up/down orientations, and even spirals and circles. The

reading directions for *Going Forth* emphasize that the interface is scrollable in both

directions (left/right and right/left, up/down and down/up), an artistic decision that relates

interface design to Egyptian inscription systems and implicitly to an ancient Egyptian

worldview. Implementing this design in an electronic environment further suggests that

like the ancient Egyptians, we do not so much leave history behind as carry it along with

us.

The Egyptian practice of assigning both pictographic resemblances and sonic

values to hieroglyphs meant that the primary relationship was not between arbitrary mark

and corresponding sound, but a more complex relation between iconic image, acoustic

production, and recognizable speech. Since there were no sonic values for vowels, the

acoustic elements were underdetermined by themselves (for an equivalent example in

English, suppose that an image has the sonic value of "tr," which depending on the context could stand for "true," "tar," "tear," etc.). Determinates were necessary to eliminate the ambiguity and tie the image to the correct speech sound. Meaning was thus negotiated among several images, and it was their interrelation that determined significance rather than a one-to-one correlation between mark and sound. Moreover, *Going Forth* suggests that there was no clear distinction in ancient Egypt between writing and art. Art did not so much imitate life as it imitated and was imitated by writing, which is another way to say that world view and inscription system were intimately related. Transported into an electronic environment, these correlations between word and image, sound and mark, icon and icon, take the form of complex relations between multimedia components and navigational functionalities in which meaning emerges from their interrelations rather than from the verbal narrative alone.

 Going Forth dreams of a richly decorated and potentially infinite inscription surface that enables fluid transitions between exposition, narrative, maps, photographs, linguistic information and historical documentation. The ur-text is of course the Egyptian *Book of the Dead*, with special emphasis on Spell 64, an incantation so powerful that it was often kept secret and omitted from many versions of the *Book of the Dead*. More than any other single spell, it was Spell 64 that was deemed most important in releasing the soul from the scene of judgment into eternal life. Dense with numerological meaning, 64 marks the conjunction of the perfect square of 8 X 8, the union of three and four in 4 X 4 X 4, and of two, three and six in 2 X 2 X 2 X 2 X 2 X 2. The electronic work preserves this numerology by creating three different narrators, all of whom are aspects of the same persona, and eight different ways of telling the story, indicated by the row of

eight icons at the top of the screen.   In addition, the emphasis in *The Book of the Dead* on getting the spell exactly right has its parallel in getting the code exactly right. A spell incorrectly articulated fails to produce the desired result, just as code with an incorrect syntax fails to work when processed on the computer. Both function as what I have elsewhere called material metaphors, for they enable a transfer of sense to take place between verbal formulation and material circumstances, for example by releasing the soul from the underworld or causing the computer to generate a screen display.

The conjunction between spell and code foregrounds the fact that electronic literature has a very different materiality than a print book. Strictly speaking, an electronic text is a *process* rather than an artifact one can hold in one's hand.   It cannot be accurately said to reside in a CD-ROM, a diskette, or even on a server; what exists at such locations are simply data and commands. Coming into existence as a text the user can experience requires that the appropriate software run on the right hardware. If the software is obsolete or if the operating system cannot recognize the commands, in a literal sense the work does not exist. The specificity of this ontological condition requires us to re-think many of the presuppositions that have evolved through the deep time of the print tradition. Hardware and software act not merely as vehicles to deliver text but rather enter consequentially and dynamically into the production of the text as such. Every act of reading electronic literature therefore takes place within a distributed cognitive system that includes both human and non-human actors.

Moving deeper into the machine means actively engaging these conditions of production and using them as resources for artistic creation. Interrogating the interface *("~~database~~")*, developing a creolized language of English and code ("_][ad][Dressed in

a Skin C.ode,*"*), crafting metaphors that connect the interface and the human face

("*Trans*lucidity"), using multimedia capabilities to create synergistic effects ("St.

Caterina") and figuring the screen as a writing surface that embodies a world view

("Going Forth") are strategies that have no exact equivalents in print texts. As electronic

literature matures, it develops rhetorics, grammars, and syntaxes unique to digital

environments. It calls forth from us new modes of attending—listening, seeing, moving,

navigating—that transform what it means to experience literature ("read" is no longer an

adequate term). If each era develops a literature that helps it understand (or create) what

it is becoming, a better comprehension of our posthuman condition requires a full range

of literary expression, print and electronic. If the future that electronic literature enacts is

our future as well, we can encourage our students to engage with it by expanding the

range of our rhetorical attention to include all the diverse semiotic components offered by

compositional practices in electronic environments. The feedback loops that connect

writing and reading, composition and analysis operate differently in digital media, and

only when we are fully aware of the specificity of multimedia production will we exploit

it for the remarkable resource it is.

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[1] Documentation on ~~database~~ is available at www.english.ucla.edu/faculty/hayles.

[2] Forthcoming from Spineless Books, http://www.spinlessbooks.com/.

[3] M. D. Coverley, *The Book of Going Forth By Day*, http://califia.hispeed.com/Egypt/, viewed June 15, 2002.

[4] Lev Manovich, *The Language of New Media* (Cambridge: MIT Press, 2001), "The Forms," pp. 212-285.

[5] MEZ, http://netwurkerz.de/mez/datableed/complete, viewed June 15, 2002..

[6] MEZ, http://www.cddc.vt.edu/host/netwurker/, viewed June 15, 2002.

[7]Rita Raley, "Reveal Codes: Hypertext and Performance," *Postmodern Culture* 12.1 (2001), http://muse.jhu.edu/journals/pmc/v012/12.1raley.html.

[8]John Cayley, "The Code is Not the Text," in *P0es1s: Poetics in Digital Text*, edited by Friedrich W. Bloch, Christiane Heibach and Karin Wenz (Vienna: Triton, forthcoming 2002).

[9]Talan Memmott, *"E_CEPHALOPEDIA||NOVELLEX,"* Drunken Boat #3, http://www.drunkenboat.com, viewed June 15, 2002.

[10]Talan Memmott, "*Trans*lucidity," frAme #6, http://trace.ntu.ac.uk/frame6/, viewed June 15, 2002.

[11]Lev Manovich, *op. cit*.