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Inner Workings: Code and representations of interiority in new media poetics

By John Cayley

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Abstract

'Inner Workings' addresses itself to the methods, properties and practices of writing systems, including human writing systems, whose very signifiers are programmed. What does programmed signification tell us about the inner human writing machine? John Cayley's essay participates in relevant metacritical and metapsychological discussions - reexamining Freud's Mystic Writing Pad in particular - and is specifically sited within the context of debates on code and codework in literal art. Rather than revealed interiority, code is the archive and guarantee of inner workings than reside beneath the complex surfaces of poetics in programmable media.

> . . . a poem is a small (or large) machine made of words.
> -- William Carlos Williams
>
> . . . the most complex machine is made of words.
> -- Jacques Lacan
>
> . . . [the Mystic Writing-Pad] solves the problem of combining the two functions by dividing them between two separate but interrelated component parts or systems.
> -- Sigmund Freud
>
> It is not a question of a negation of time, of a cessation of time in a present or a simultaneity, but of a different structure, a different stratification of time.
> -- Jacques Derrida[1]

When our privileged writing machine -- the historical synthesis of specific human cultural activities with ever-evolving devices of mediation -- is expected (if not required) to handle coded, programmed signifiers, what does this tell us about the

methods and properties of the machine itself?[2] This essay addresses itself to this question and to related discourses. As such it participates in meta- or cultural-critical discussions, although this participation emerges as much from this writer's practice as a maker of literal art in networked and programmable media, as from specifically theoretical engagements.

Today, in the context of new media, writing can be "codework" and this fact has important implications for the methods and properties of signification in literal art.[3] In a number of previous essays, I have turned my attention to codework, and to the role of code in literal art.[4] To provide context, I summarize briefly some of the points and arguments from these previous analyses. Meaning creation and signification as performance are at the heart of a poet's work. New ways of performing and generating -- and new ways of understanding these activities -- are always of practical interest to the poetic writer, especially where such developments have potential for aesthetic, social, and political affect. It is somewhat difficult for me to explain the desire to directly address the properties and methods of the singular writing machine underlying this practice. "Machine" here must, of course, be taken to include the "psychic apparatus," as well as the embodied writer and all the prosthetic, mediating devices of inscription. I'm obliged, therefore, to trespass into varieties of psychoanalytic discourse with which I have little expertise, and where many important critics have made major statements. In the midst of one of these, Jacques Derrida asks, ". . . what is a text, and what must the psyche be if it can be represented by a text? For if there is neither machine nor text without psychical origin, there is no domain of the psychic without text" (Derrida "Freud and the Scene of Writing" 199) . Derrida goes on to explicitly acknowledge a history of textual technologies, and the way in which technological developments feed back into -- or perhaps determine -- our understanding of the psychic, a theme that has been taken up and elaborated by Jacques Lacan and, more recently, by Friedrich Kittler in particular.[5] The present essay attempts to delineate certain aspects of textuality that are foregrounded by poetic practice in new media. If we agree with Derrida's formulation, then insight into the materiality of language as revealed in these media should provide useful commentary on our understanding of the psychic apparatus and the writing machine in which it participates.

Our starting point, as already indicated, is a particular practice of writing, writing in a particular context. Rather than take on the entire gamut of textual art in network and programmable media, I focus here on codework, and I will further refine my address to codework by applying a particular sense of "code" below. One might propose that the practice of codework would yield a commentary on the psychic apparatus and writing machine of our present historical moment if, in some sense, the performance of this writing practice were mimetic of these devices, if it were a reflection of these root objects. However, the trope of mimesis and the figure of "the mirror" are highly charged in this context, for at least two quite distinct reasons:

because, traditionally, mimesis is implicated with, for example, Realism and Naturalism, and because the mirror and the process of reflection is such a trial of the human and posthuman in critical thought, especially since Lacan.[6] Where we do claim that codework significantly reflects the psychic apparatus, we must, therefore, make it clear at the outset that this is not because it is a necessary and willing participant in some Naturalistic or Realistic project for new media's better expression and representation of subjects and objects. The poetics of codework need not be bound to some particular rhetorical goal; it is just as clearly focused on, for example, the formal aesthetic that it renders, emergent from the material of language. Distinguishing codework from a mirror in Lacan's sense -- that is, a self-subsistent substitute for and implicit challenge to originary "so-called human" consciousness -- is not straightforward in this context. At one and the same time I want to say and to demonstrate that codework does reflect -- amongst many other things -- the imaginary devices of interiority but that the way in which it does so creates generative problems for even sophisticated versions of arguments that recast consciousness as an implicitly posthuman and technologically determined reflection from a complex surface.

While the mirror is first and foremost the device of transmission, the complex surface we imagine and use in the current historical moment must also provide devices of storage and symbolic manipulation (programming) that reflect the technology of our times. Is such a complex surface still a mirror? The answer to this question hinges on two further questions. A mirror "runs by itself" -- no need for it to be started up or attended to -- and generates what is agreed to be a more or less perfect reflection. It is also, therefore, the image of a perfect machine, a machine that runs by itself, perfectly, reflecting the sublime (in Lacan's thought experiment) even if not, perhaps, a fully engaged humanity. The programmaton (computer system) transmits, stores, *and* manipulates. Does it also run by itself, generating objects that we recognize as perfect and adequate images? of humanity? of the technological sublime? Any positive answer to this question provides a significant update to Lacan's challenge to notions concerning uniqueness and subjective agencies of human consciousness, and yet it is also an update that incorporates the restructuring of time, time that is nothing without culture and history, time that is, perhaps, all too human. Recording technologies -- devices of writing -- introduce images of and in time without, necessarily, producing anything other than the persistent "mirror images" of objects that would otherwise be momentary, ephemeral. As such, these recording devices could, as varieties of time-sensitive mirrors, run by themselves without intervention. However, once a complex surface is programmed to manipulate the images it receives, reflects, and records, then the radical restructuring of image and time emerges as more than trivial and expected; it emerges as something that must be accounted for. The mirror distorts. It reveals, in fact, that it was always distorted, always preprogrammed in a particular way (to reflect "perfectly" or make a "perfect" record). The so-called mirror is always already

coded. The signs we read on and within its surface are themselves objects of code, produced by and informed by code. What they mean depends on the codes running at the times they were received, recorded, transmitted; depends on how they were, at one or many specific times, symbolically manipulated.

In recent years developments in writing practice and the engagement of writing with evolving media suggest a parallel development with this elaboration of metaphors for the psychic apparatus. The programmability of the signifier in writing has become explicit and visible. We can now examine these complex, coded signs, watch them working "in real time," and see how they reflect back and affect the writing machinery that has generated them. If Stendhal's ideal image for the novel was "a mirror walking along a street" (*The Red and the Black*), the book is the recording device for writing that pretends to serve as the transitional mirror-like device I evoked above. It is a recording technology that seems to run by itself, transforming the momentary and ephemeral into something persistent and potentially of lasting value, but without revealing the processes through which it does so. These processes seem to vanish into the natural or real, simply because they are interiorized functions of literary culture. The book pretends to serve Stendhal's Realist/Naturalist author. It receives the image that the *fl‰neur*-mirror-author reflects and transmits it perfectly, via a critically established ideal form of the author's text, to its readers.[7] Even before words migrated from this elaborate, culturally privileged, magic mirror to the screen -- from codexspace to cyberspace, the underlying codes and coding -- including Barthes' semiotic analyses, all the paratext of publication and framing, deconstructive strategies of reading, and so on -- had been brought into the open. This was well before they famously found specific technological, and later "new media" instantiation in hypertext, cybertext, and the critical discourses spawned by these forms. Nonetheless, historical developments in technology now confront us with words on screen and inside the machine, words floating on and flickering beneath the complex surfaces of new media, surfaces that may or may not constitute an even more elaborate form of mimetic mirrorspace in the sense discussed above. The words we see in these screens manifest behaviors, and they may, in certain cases, exist only during those specific times when the codes and programs that support them are running. It is, therefore, somewhat more difficult to see them as reflection -- unless this can mean that they are the reflection of processes -- because they are themselves processes. Works formed of such entities are codework of the kind I would like to address.

In other discussions of codework, I have distinguished at least five senses in which the term "code" is used to qualify some variety of writing in networked and programmable media.

1. As (a special type of) language in itself, viewed and presented as such;

2. As incorporated into natural language (the language here functions, but the code as such is "broken" at least in so far as it does not and can not run);

3. As a text incorporating natural language (here, the code is functional or more accurately compilable or interpretable by a machine, while, typically, it may appear to be "broken" as natural language, in the sense that is severely constrained by, for example, syntax that is native to the code or the necessity to employ "reserved words");

4. As system of correspondences, as encoding;

5. As code which runs (in time), generating or modulating the writing of which is it an intrinsic or necessary part.[8]

Particularly in the context of the present essay I want to further distinguish writing belonging to the first three categories from writing in the last two.[9] One way to make this distinction is simply to say that despite the fact that texts in the first three categories make use of code -- focusing on code as language or instantiating language with which it is intermixed or hybridized -- they are both written and read using strategies that are familiar to criticism and interpretation. Typically, an author initiates the processes and practices of writing that address code and transforms them into literal art that is presented as what I call an interface text. A reader then receives the resulting interface text and further processes it or attempts to reconstruct the processes of the author. Authorship, publication, reception: these categories dwell within the familiar cultural framework for literary production through which text is, nonetheless, multiply mediated, and the result and representation of process. Such mediation and process typically go unnoticed. In what follows I want to make it clear that any meta-critical interpretative insight we derive from concentrating on writing belonging to my fourth and fifth categories does not negate the fact that such writing is hard to distinguish *qualitatively* from writing generally. The differences are in mediation itself and the manner in which time-based processes of inscription are mediated. In simple terms, when encoding is invoked as definitive of a particular textual practice, the processes of textual delivery and display are mediated and perceived as such. If and when the text can only exist while coded time-based processes run, then the processes both of composition and reception are *perceptibly* mediated. Not only are they mediated, but we are aware that they can be further manipulated, programmed, subject to transaction with their readers.

N. Katherine Hayles' "flickering signifier" puts a name to an important aspect of the materiality of language which is foregrounded by a textual practice characterized

by *encoding*, my fourth category. Bearing in mind Hayles' definition of materiality in this context . . .

> *The materiality of an embodied text is the interaction of its physical characteristics with its signifying strategies.* (Hayles "Translating Media")

. . . here is one of her suggestive descriptions of the signifier of electronic textuality:

> In the computer the signifier exists not as a durably inscribed flat mark but a screenic image produced by layers of code precisely correlated through correspondence rules. Even when electronic hypertexts simulate the appearance of durably inscribed marks, they are transitory images that need to be constantly refreshed to give the illusion of stable endurance through time. (Hayles "Print Is Flat")

What does this screenic image of text provide in terms of signifying strategies? Hayles concentrates on a "power" that is leveraged by encoding through the hierarchical layers of symbolic language in programmatological systems.

> The multiple coding levels of electronic textons allow small changes at one level of code to be quickly magnified into larger changes at another level. The layered coding levels thus act like linguistic levers, giving a single keystroke the power to change the entire appearance of a textual image.[10]

Elsewhere, encoding is also associated with intermedia translatability (because the same lower-level code may be used to represent text, sound, graphics, and so on), and with "... violations of the threshold between code and text" (Raley) . The layering and depth of encoding -- the vertical, hierarchical slippage which encoding enables and represents -- comes to be appreciated as a value and aesthetic in itself, and to be used, in fact, to produce the types of writing in my first three categories of codework.[11] However, Hayles is beginning to address the question of what it is, materially, that we are reading as we look at the screen. Our appreciation of encoding allows us to perceive a *flickering* signifier. This image of screenic text flickers and generates an underlying representation of multiply encoded depths. Nonetheless, the processes highlighted in this way are intended to render "the illusion of stable endurance through time."

What about those processes which are not dedicated to reproducing a persistent textual image? What about processes which change the text?

> There are data files, programs that call and process the files, hardware functionalities that interpret or compile the programs, and so on. It takes all of these to produce the electronic text. Omit any one of them, and the text literally cannot be produced. For this reason it would be more accurate to call an electronic text a *process* rather than an object. (Hayles "Translating Media")

Even these other entities -- files, programs, hardware functionalities that are "literally" necessary for the production of the electronic text -- seem to be working in the service of a familiar "literary" textual persistence. Is the text here seen as a process or the authorized result of a process? Finally, where text as "transitory image" . . .

> [. . .] can be mobilized through such innovations as dynamic typography, where words function both as verbal signifiers and visual images whose kinetic qualities also convey meaning. . . .[12]

. . . are these dual-aspect "word-images" functioning, for the critic or reader, in time? Real time? The author's time? The reader's? Are they processes or have they just acquired (new) qualities?

We do want to argue, in agreement with Hayles, that text is process, but in order to allow code to comment on the psychic apparatus and writing machine, we need to elaborate a stronger statement of this argument, one that is less fixated on a layered, flickering structure that imitates persistent text, or on a text -- persistent in this sense -- that is able to "acquire" paratextual dynamics. Instead, we need to recognize a textuality that is itself a dynamic because it contains, conceals, and runs on code, because it exists only as a durational, transliteral process.

The "single keystroke" that changes the textual image can function as a key character for us in setting out this argument. It seems to me that the keystroke in Hayles' paragraph remains associated with *paradigmatic* changes cascading through the encoded hierarchies she highlights. In its context, her keystroke recalls a *command*-keystroke, one that, for example, changes the text's font from plain to bold. Merely saying "change's the text's font" gives a lie to the nature of the implicit transformation of "textual image," because "the text" persists. Its underlying codes and attributes may be changed but "the text" remains as the abstracted, ideal text of criticism, sensitive to its paratextual qualifiers, and multiply encoded, yet unchanged for the purposes of critical interpretation. If I am right, what we are bracketing, what has become all but invisible to us, is the "single keystroke" that is an order of magnitude more common and ordinary (and less "commanding") but that, in each instance, changes the textual image far more radically. I mean the keystroke that places a new letter on the screen and within the writing surface, the keystroke that composes the text in time. I'm making hundreds of them now. Now you read the result of this process, just as I do "now." But there is little stopping you, or me, now and "now," from taking a digitized copy of this text, calling it up in a word processor and making keystrokes that will, as you or I make them, transform the text back into the process -- both a continuation of one and the same process and also same kind of process -- that it is "now," as you or I type.

My aim is not merely to point out the way in which the seemingly banal, instrumental transactions of typing in digital media produce an obvious, but in many ways radical,

instantiation of text as process; I want to look at the keystroke more closely and see what else it conceals. When you hit a key to add a character, you signal an event to a program that is already running, waiting and listening for just such events. The keystroke sets off subprograms that change the text in time. It takes real time to run these subprograms which make changes to the system's state and its associated screenic image, while the text, in the more conventional sense, is also globally transformed in the differently structured time of composition and editing. Viewed overall, as a program of events with durations, text-making in new media is thus an iterative series of transactions with hidden programs that were composed in the "code" of my fifth category.[13] These intrinsically time-based transactions mediate the manipulation of symbolic signifiers that we call writing. Strictly, I argue, text *is* this iterative process, rather than the result of the process.

It suddenly seems remarkable to me that this single keystroke is able to bring out all three of the chief aspects of new media poetics that I now wish to highlight and discuss in order to shift and develop the notion of textuality. These three aspects fall under the rubrics of manipulation, time, and concealment. These are also the aspects of new media poetics that correlate strongly with the discussions of the psychic apparatus and writing machine elaborated through Freud, Derrida and Lacan/Kittler. In the developed world, writers generally have swapped their typewriters for word processing programmatons with remarkable speed and alacrity. In no time, the keystroke of word processing has, as I suggested above, become all but invisible: interiorized as the unremarkable and entirely instrumental, basic gesture of writing (as if writing had not changed, as if the keystroke were a typewriter keystroke). But as we have seen, this gesture exhibits characteristic aspects of the new and potential mediation of writing, and these aspects of mediation have a bearing on poetics -- on the way that writing is and will be made -- and on our understanding of the very machinery of inscription.

In 1924 Freud described a writing machine, the Mystic Writing-Pad, that allowed him to figure the psychic apparatus and develop his metapsychological arguments. Freud conveys his excitement at discovering a toy that appears to be a simple "writing-tablet," "But if it is examined more closely its construction shows a remarkable agreement with my hypothetical structure of our perceptual apparatus and that it can in fact provide both an ever-ready receptive surface and permanent traces of the notes that have been made upon it."[14] Tablets similar to the Mystic Writing-Pad described by Freud are still produced as writing and drawing toys for children. They consist of a slab of dark, waxy resin, covered by two thin sheets fixed to the pad along one edge. The top sheet is transparent, a celluloid protective layer. The sheet beneath it is translucent waxed paper. When a stylus is pressed against the sheets, resting on top of the resin, the waxed paper layer adheres more strongly where it is impressed and shows the inscribed mark, dark against its lighter background, through the protective celluloid. Any past impressions of the stylus

remains in the resin, but when the sheets are lifted clear of the underlying slab, the marks just made vanish from the visible surfaces. A hidden trace remains on the resin, although any potential for its retrieval is problematic.

In *Archive Fever*, Derrida returns to his earlier discussions of Freud's "Note upon the Mystic Writing-Pad" noting that, "To represent the functioning of the psychic apparatus in an exterior technical model, Freud did not have at his disposition the resources provided today by archival machines of which one could hardly have dreamed in the first quarter of this century" (Derrida *Archive Fever: A Freudian Impression* 14) . But even then, when Freud wrote his Note, Derrida acknowledges, the Mystic Pad was a "child's toy." He therefore goes on to ask, "Do these new archival machines change anything?"[15] Kittler implies that they do, that "Freud's materialism reasoned only as far as the information machines of his era -- no more, no less," with the consequence that Freud described a model for the psychic apparatus ". . . just short of the technical medium of universal-calculation, or the computer" (Kittler "The World of the Symbolic" 134) .

The Mystic Writing-Pad does have properties and methods that it shares with modern information processing machines. Moreover, Freud demonstrated that the Mystic Pad addressed the most important of these, one of his and our chief technological problems -- how a single apparatus might manage both storage and transmission. However, following and explicating Lacan, Kittler implies that the reason the Mystic Pad falls short of our later instantiations of a model is that it lacks "circuits" (Kittler "The World of the Symbolic" 144) . The circuit encompasses transmission, storage and symbolic manipulation: "In circuit mechanisms, a third and universal function -- the algorithm as the sum of logic and control -- comprehends the other two functions" (Kittler "The World of the Symbolic" 144) . In Kittler's account even Lacan's famous dictum on the unconscious -- the very entity Freud sought to figure in the Mystic Pad -- "The unconscious is the discourse of the other," is reducible to an all-encompassing circuit: "The discourse of the other is the discourse of the circuit" (Kittler "The World of the Symbolic" 145) .

Where is code in all this? For Lacan and Kittler, the role of software as a *distinct* component of the ultimate information machine is a problem, or perhaps a non-problem in that they reduce software and hardware to each other. In Kittler's representation, Lacan's circuits are a final elaboration -- embracing symbolic manipulation -- of the mirror machine that runs by itself, indistinguishable from so-called human consciousness, a media machine that "function[s] in the real, independently of any subjectivity."[16] How or whether this machine is programmed is not at issue, and Kittler provides some reasons why this might be so in the aptly titled essay "There is no software." If any hardware that implements a universal Turing machine can emulate any and all Turing machines, then ". . . precisely because eventual differences between hardware implementations do not count anymore, the so-called Church-Turing hypothesis in its strongest or physical form

is tantamount to declaring that nature itself is a universal Turing machine" (Kittler "There Is No Software" 148) . On the one hand hardware differences do not count and the only differences are differences of software, on the other, "there is no software" because all representations of the symbolic are, in new media, reducible to hardware, to "signifiers of voltage difference" within endlessly equivalent Turing machines (Kittler "There Is No Software" 150) . For Lacan's thought experiments this erasure of software does not really matter. Images and signs can circulate in the hardware of the real. There are simply circuits. Our anxieties over significance are what they are. By contrast, for Kittler "no software" in this sense generates a necessity for the "nonprogrammable machine," for "sheer hardware, a physical device working amidst physical devices and subject to the same bounded resources" (Kittler "There Is No Software" 154) . Such machines cede their (Turing) universality and their programmability for the sake, it seems, of the close, high, complex, hugely multiple interconnection demanded by networked media (Kittler "There Is No Software" 154-55) . Leaving aside the question of how and why this necessity arises and what it means (is Kittler performing a speculative media history or announcing the resurgence of "the familiar face of man [sic]"?), here I simply want to point out that programming as an active practice is abandoned in Kittler's discourse as either pointless (in the world of programmable machines) or unnecessary (in the world of objects that are unprogrammable).

In passing, Kittler mentions that rhythm plays some role for Lacan in his sense of the circuit.[17] In Freud, and in Derrida's reading of Freud, there is an even stronger awareness of time and, as Derrida implies, a manipulation, even a generation of time, differently structured and stratified, cultivated by the psychic apparatus, we might say, out of raw time into a culture of human time. Kittler and Lacan are concerned more with the ultimate infomedia machine, a machine at the end of human time or, at the very least, with the current synchronic state of this machine and its relationship to psychology. They assume a meta-critical or meta-psychological point of view, from which the practices that continue, rhythmically, to build or, indeed, to program, the machine are bracketed. They ask what, ultimately, *is* the (ultimate) machine and what does the machine itself signify? Has human time stopped, and posthuman time begun? At the point where software is dismissed in his influential essay, Kittler qualifies his dismissal, saying "Rather, there would be no software if computers were not surrounded by an environment of everyday languages" (Kittler "There Is No Software" 150) . He acknowledges a continuing practice of human, natural language-making which, at least potentially, contextualizes the ultimate, "-wareless" infomedia machine.

It is not simply that the processes of the infomedia machine run in an environment of language without any transaction with human language other than the transactions carried out in processes of interpretation. In practice, if not in Lacan/Kittler's temporally stunned theory, natural language periodically reaches

into and manipulates the machine. At any one moment we may, like Kittler, take its state to be (Turing-universally) programmed and thus, also in one of Kittler's senses, unprogrammable. However, moments do pass both in the ineluctable course of time and change, and in the very processes of technological history that Kittler's writing, in general, highlights -- the machine is programmed and reprogrammed. Here, however, Kittler's analysis has a negative bearing on practice because it brackets the machine's momentary, historical characteristics. By focusing on its ultimate universality it removes its images and renders the machine less useful as a tool of thought.

Kittler's analysis contrasts with the depths of thought and affect that both Freud and Derrida derive from one particular machine, the Mystic Writing-Pad. Derrida's question remains, has anything really changed? Do better machines mean better understanding or figuration? The way in which both Freud and Derrida are able to see time as constructed and restructured in the complex image of the Mystic Pad is a case in point. When taking issue with Freud and pointing to the inadequacies of the Mystic Pad in terms of its technological development, Lacan/Kittler treats it as if Freud were making a doomed attempt to represent or instantiate the ultimate machine, before that machine had, in common parlance, "been invented" or, in Lacan/Kittler's terms, before it had made humanity its subject (Kittler "The World of the Symbolic" 143) . But, as Derrida recalls, the Mystic Pad was and is a toy, and a child's toy at that. Not only is it (pre)programmed and unprogrammable since it is a physical device subject to bounded resources, it is a simple, childish automaton that no one would ever consider using as an actual everyday writing tool, let alone as some ultimate programmable universal device.

The "power" of the Mystic Writing-Pad is, therefore, something quite different from the "power" of information machines or the power leveraged through Hayles' hierarchies of encoded symbols. It is arguable that our objects of thought are automata, toy media, atoms with properties and methods that come to be considered (or constructed) as essential and atomic at particular moments in intellectual history.[18] I suggest that the Mystic Writing-Pad is just such a toy medium, one whose significance has not been exhausted or written off by actual technological developments. We continue to chose to see the Mystic Pad as a significant model for the psychic apparatus and writing machine, not because it is a fair approximation of some ultimate infomedia machine, but because it highlights practices -- of art and thought -- that resonate with our poetics, with the way we make things, and particularly the poetics of literal art in new media. It is not so much a model or image for the way the mind *is*, but for the way the mind *acts* and is acted upon.

If it were not the case that the Mystic Writing-Pad resonates in this way, then it would be harder to explain why, for example, the word processor has not supplanted it as a preferred model. If we follow the processes of the keystroke in a modern word

processor, it performs everything that the actions of the hand manipulating the Mystic Pad performs -- receiving an impression, transmitting it through a barrier to a concealed place where it can leave a quasi-permanent (how will we ever know how permanent?) but unreadable trace, visible only when the recording surface is figuratively in contact with the transmitting membrane or surface. And yet the keystroke -- as I type now, for example -- is invisible to critical thought. It has become a universal tool and has ceased to function as an atomic image of what I am trying to create or to signify. It has been absorbed into and appropriated by traditional, received practices of writing. We even forget that the appearance and disappearance of letters as we write and erase with a word processor are the results of specific programming, particular coded processes. It's clear, however, that if we wanted to emulate the Mystic Writing-Pad on our screens, we would have to write a program to make our systems behave like a Mystic Pad, or have such a program written for us. One result of the ensuing processes of coding would be to realize and instantiate the images and gestures of a simpler, more childish, more primitive toy medium. But now, even without undertaking actual process of programming, the Mystic Pad's images and gestures remain visible to my thinking and promise to help me bring out what I am trying to convey. As already indicated above, for me the toy figures a performance of writing characterized by structures of manipulation, time and concealment.

The Mystic Writing-Pad is quite literally manipulated, and Freud leaves us with powerful images of human hands not only writing but also periodically raising and lowering the sheets of the Mystic Pad to erase its most recent inscription and to prepare for a new impression. I associate this manipulation with programming, or coding. Generally speaking, the active hand -- moving, grasping, making traces and working with those traces -- provides us with our primary metaphoric image for creative work and specifically, in this context, for the organizational activities performed in relation to data. Programs *manipulate* data. Writing machines -- including the psychic apparatus that is described in and constituted by text -- are programmed to manipulate text in a particular way. The Mystic Pad is preprogrammed in that it is made to receive, store, and transmit impressions -- especially, for Freud, written language -- *in a particular way*. The Mystic Pad is, for example, programmed to draw out distinctions regarding: the way that writing is made -- in ordered sequence: stroke by stroke, letter by letter, word by word, and so on; the way in which it is impressed into the storage media -- by pressure through a membrane into a soft, underlying, waxy surface; and the way the writing is erased -- in a single gestural movement, without regard to the sequence of its inscription, leaving behind a now invisible but ultimately detectable, perhaps even subtly perceptible, trace. The hands may also be an image of programming in that they may manipulate the Mystic Writing-Pad in a particular way, not only to write particular sequences of strokes and letters, but also to determine the order and

timing of these sequences, or to erase the inscription in a newly programmed manner.

At the outset of *Archive Fever*, Derrida's return to a scene of writing figured by the Mystic Pad supposes that it is not so much the technical capabilities of the device that make it appropriate as an external model of the psychic apparatus, but the manner in which it both generates and destroys the archive.[19] Freud signaled the periodic gestures of the hands as they manipulated the Mystic Pad and went so far as to suggest that this inherently time-based image of periodic making and unmaking -- more of a cinematic image, a clip or loop -- was the origin of the human sense of time.[20] Focused, as we are in literate or print culture, on the persistence of text, we ignore the tiny cycles of making and unmaking that occur constantly as we "process" words. The larger, visibly manipulated, visibly programmed periodic gestures of the Mystic Writing-Pad are not only impossible to ignore, they become affective: suggesting the generation of human time to Freud, a mode of archival creation and destruction to Derrida, and a whole range of potential signifying strategies to literal artists who are prepared to build time into their atoms and automata of signification.

If you program your system and its screen to behave like a Mystic Writing-Pad, then your writing and your atoms of writing become time-based. The actions and gestures of coded processes that transcribe and erase the elements of language that they manipulate do not disappear; they cannot be assimilated by the interiorized processes of traditional literary production and reception. More importantly, they have to be read throughout the entire cycle of their inscription and erasure. Just as we have to watch the whole process of writing and erasing in order to appreciate the Mystic Pad, when dealing with writing in progammable media that implements and incorporates code -- here a program that emulates the Mystic Writing-Pad -- we must read the entire duration of a literal automaton, observing and appreciating the particular way in which it is written; the particular manner, means, and duration of its persistence; and the particular mode of its destruction.

In Freud's Mystic Pad another mark of its programming is its divided structure and the concealment of its storage medium. The separation of functions (quoted as a epigraph to this essay) is very significant for Freud, an image of the way that memory in the unconscious might operate as a distinct psychic agency. The three aspects I am highlighting -- manipulation, time, and concealment -- are never divorced. As Derrida points out in his first visit to the scene of writing, it is not only time as periodic gestures of creation-destruction that is modeled by the Mystic Pad, there is also the time taken for what Derrida calls "breaching" to occur, the time and energy it takes to get through the barriers between the separated functions.[21]

In so far as the coding is built into the Mystic Writing-Pad, it is concealed, it has to be brought out and its structural relevance to the performance of writing has to be

demonstrated and tried. In its divisions and barriers the Mystic Writing-Pad also has coding, coded processes that are literally concealed, processes that are structured by its form, such as those taking place when the impression moves through the protective sheets into the waxy surface or when the sheet is raised and the inscription vanishes. You do not see the mechanism or its operation; you see the image of the inscription on the complex surface of the device, or its disappearance. For Freud this concealment and inaccessibility allowed him, chiefly, to imagine a model for the unrepresentable, for the unconscious. In the poetics of new media, code may be seen to serve the same function. Because it is invisible when it runs -- as it plays with and within the structured form of programmable machines -- it can perhaps serve to represent what is always hidden: interiority, the phenomenological opacity and inaccessibility of inner life. This is in a cultural context, that of new digital media, where questions of how or whether to try and represent the inaccessible interior are rarely addressed.[22] In the virtual worlds of digital and net culture, transparency and translation are often taken for absolute if utopian values -- across media, across the cybernetic-organic divide, not to mention those of gender, geography, species and so on -- all barriers that virtual-visceral culture pretends or, literally, *seems* to challenge.

In her recent essay on codework, Rita Raley quotes the work of an artist, Jessica Loseby, for whom code functions in a manner that accords in some measure with the relationship I am figuring between code and interiority. This relationship is expressed in terms of fear of the dark and unknown:

> For Loseby, code is initially understandable only in terms of impenetrable darkness. It lurks beneath the surface of the text, but it is not in direct dialogue with that text: it is read and yet not read at the same time. The fear, further, is that code is autopoetic and capable of eluding the *artist's* attempts to domesticate it and bring it to order: "I imagine it unlocking itself in my absence," she notes, conjuring a vision of code compiling itself, generating its own output, and moving toward self-organization. In this instance, code is "scary" because it is both unknown ("foreign") and known (understood to have emergent properties). (Raley)

I am very much suggesting that code resides in psychological darkness and figures an inaccessible unknown, but not, I think, for quite the same reasons that Loseby imagines. For her, the code is a potentially autopoetic agency in a darkness inaccessible to her. The problem with this perspective is that we know (or believe) that the code has been composed. We have not written it and we may not be in full control of its operation. However, we believe that is has been composed by someone, some other, a programmer, a geek perhaps, but human like ourselves. We do not yet believe that coded entities are autonomous beings, commensurate with human subjects. Moreover, we know that we ourselves might learn to make code. Loseby's darkness is not impenetrable; it just takes time and technique to get

in there. In contrast to her impression, the aesthetics and politics of digital culture is directed towards the erosion of opacity -- technical engagement, discovering how things works, tends to encourage and valorize transparency.[23]

For me, the code is inaccessible and dark because its very operation, taking place within some particular duration, necessitates its invisibility and inaccessibility during the time that it performs. Code is not visible, not readable *as it runs*. The *language* of code is visible on the surface of the interface text in codeworks from my first three categories. But code that is running cannot be read during the time in which it produces the time-based artifact that is precisely that which is being rendered visible and offered to us for reading or appreciation.

This is the point at which the toy media of coded signification diverge in terms of their properties and methods from the toy medium, the Mystic Pad, that became central to discussions of the psychic apparatus since Freud's Note. The way in which the Mystic Pad writes is what guarantees its continuing significance and affect, but these methods and properties are constrained. They offer up the possibility of continual, periodic reconfiguration and manipulation -- the images of the hands writing then lifting and lowering the writing surface, form and destroying language -- without providing a way to reconfigure the Mystic Writing-Pad itself as an instrument of thought and poiesis. The concealment of the processes of meaning creation in the Mystic Pad is built into the device, with its literal barrier-forming membranes and its underlying inscribed waxy surface, an engram and palimpsest, unreadable without, precisely, the mediation of its protective sheets -- the thin surfaces which both display the generated letters while forming a veil or shroud over past inscriptions, whose images have vanished and whose impressions are fading -- suffering and dying away in the destructive phases of the Mystic Pad's particular strain of archive fever.

I first attempted to understand the significance of the Mystic Writing-Pad for programmatology when one of my own works recalled the Mystic Pad's figurations to a critic:

> Material both visual and vocal, both structural and semantic, is constantly dissolving and re-solving, and giving rise to a host of readerly impressions. Fields of floating phonemes and morphemes sometimes seem to assemble into patterns -- form meaningful phrases and sentences -- only to morph away again, before our ears and eyes. Never has a visual field so significantly deepened the psychic impression of Freud's "Mystic Writing-Pad" -- the appearance and disappearance of the writing on which Freud famously likened to "the flickering up and passing away of consciousness in the process of perception." (McHugh)

But in work of the type to which McHugh refers -- work in which textual art is not only electronically, digitally mediated but in which textuality is generated by coded

processes -- in work of this type (my fifth category), the processes generating a visual field do not necessarily or primarily serve to deepen the Freudian impression.[24] They do resonate strongly with Freud's images because, as we have seen, Freud's model highlights what Derrida acknowledged as a poiesis of language emergent from the restructuring of signification in time, from continual and periodic manipulation of the processes of inscription. However, Freud's manipulations do not reach into either the structure of the devices or the signs themselves, which is what coding allows us to do. Periodically, we can reach into and reconfigure the devices of writing; we can change the way the machine both writes and destroys writing. We can turn the words themselves into devices of their own inscription and erasure. In doing so we are forced to acknowledge that what we make only has meaning in relation to this periodic reconfiguration and to the inherently time-based performances of writing which it produces, both in the process of reconfiguration itself and also when these procedures, coded into their devices, literally run in time, creating and destroying letters, words and larger structures of language. The correlative image of a psychic apparatus evolves and becomes less clearly focused on a Mystic Writing-Pad, but note that certain properties and methods of the devices of inscription are, arguably, preserved: manipulation, time, and concealment. Objects at any and all points in the structural hierarchy of symbolic culture are continually, periodically manipulated and reconfigured. Both this continual reconfiguration and the artifacts and objects it creates can only generate meaning in time and as process. The programs that guide these processes, and which we archive as code, are concealed while they operate, because their very operation is what produces the new objects and newly reconfigured objects of our attention, hiding the code beneath and within their creations.

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Notes

1. William Carlos Williams, *Selected Essays* (New York: Random House, 1954) 256. ; Lacan paraphrased by John Johnstone in the introduction to Friedrich A. Kittler, *Literature, Media, Information Systems: Essays*, Critical Voices in Art, Theory and Culture, ed. John Johnston (Amsteldijk: G+B Arts International, 1997) 24. ; Sigmund Freud, "A Note Upon the 'Mystic Writing-Pad'," *On Metapsychology: The Theory of Psychoanalysis*, ed. Angela Richards, vol. 11, The Penguin Freud Library (Harmondsworth: Penguin Books, 1991) 432-33. ; Jacques Derrida, "Freud and the Scene of Writing," trans. Alan Bass, *Writing and Difference*, 1st UK ed. (London: Routledge, 1978) 219.
2. By dint of the human-machine symbiosis, the writing machine here is always already a cyborg in Donna Haraway's and other critics' sense Donna J. Haraway, "A Manifesto for Cyborgs: Science, Technology and Socialist Feminism in the 1980s," *Socialist Review.*15 (1985). However, this facet of the argument is not elaborated here. See N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999). , especially the Prologue, pp. xi-xiv, which encapsulates many of the crucial related issues for me.

3. "Literal art" is my general term for literary/artistic/poetic writing in networked and programmable (new) media. See John Cayley, "Literal Art: Neither Lines nor Pixels but Letters," *First Person: New Media as Story, Performance, and Game*, eds. Noah Wardrip-Fruin and Pat Harrigan (Cambridge: MIT Press, 2003 forthcoming). The use of terms from the discourse and analysis of Object-Oriented Programming is intentional. I find this metaphoric/analogous usage both suggestive and generative in this context. It also allows me to avoid the always inappropriate, often essentialist connotations of terms such as "nature" as in, for example, "the nature of signification."

4. John Cayley, "The Code Is Not the Text (Unless It Is the Text)," 2002, Article in Web-based journal, *Electronic Book Review*, Available: http://www.electronic-bookreview.com/v3/servlet/ebr?command=view_essay&essay_id=cayleyele, 1 December 2002. also forthcoming (2003? in a book to be edited by Fredrich Block and Christiane Heibach as part of the series 'p0es1s' organized at the University of Erfurt (see http://www.p0es1s.net).

5. The essay I refer to chiefly in what follows is Friedrich A. Kittler, "The World of the Symbolic: A World of the Machine," *Literature Media Information Systems*, ed. John Johnston, Critical Voices in Art, Theory and Culture (Amsteldijk: G+B Arts International, 1997). I refer to Lacan's work primarily through Kittler's critical and interpretative mediation.

6. "The mirror" might more usually be categorized as a complex figure rather than a trope. I prefer to allow it greater status in this context where it can be highly determinative of the arguments concerning the posthuman. See Kittler, "The World of the Symbolic," 131-33. for a description and discussion of what he calls Lacan's thought experiment, in which he asks whether images of nature reflected in a lake, within a world without human subjects can be said to exist.

7. N. Katherine Hayles is formulating a strong critique of the still prevailing notion of the ideal text. See N. Katherine Hayles, "Translating Media: Why We Should Rethink Textuality," *Coding the Signifier: Rethinking Semiosis from the Telegraph to the Computer* (2003 forthcoming).

8. The present essay is -- given constraints of length -- necessarily lacking in discussion of examples from most of the writing to which it refers. Please see Cayley, "The Code Is Not the Text (Unless It Is the Text)." and John Cayley, "Time Code Language: Poetics and Programmed Signification," *New Media Poetry: Aesthetics, Institutions, Audiences*, eds. Dee Morris and Thomas Swiss (Iowa City: 2004 forthcoming). for more in the way of such discussion. Here also are a few indications of authors, work and critical contribution that may help to exemplify these categories. 1. Loss Pequeño Glazier champions code as language in his work (http://epc.buffalo.edu/authors/glazier/e-poetry/) and also Loss Pequeño Glazier, *Digital Poetics: The Making of E-Poetries* (Tuscaloosa:

University of Alabama Press, 2002). ; 2. Talan Memmott, Alan Sondheim and, especially Mez; 3. "perl poetry," Jodi, Vuk Cosic (for critical discussion of the above categories see also Florian Cramer, "Digital Code and Literary Text," 2001, Article in Web-based journal, *BeeHive Hypertext/Hypermedia Literary Journal*, Available: http://beehive.temporalimage.com/content_apps43/app_d.html, August 2 2002. and Rita Raley, "Interferences: [Net.Writing] and the Practice of Codework," 2002, Article in Web-based journal, *Electronic Book Review*, Available: http://www.electronicbookreview.com, September 2002.); 4. in this essay and those already cited I refer extensively to N. Katherine Hayles' work as explicating this category; 5. Jim Rosenberg, Glazier, Philippe Bootz, myself; this category is, in a sense, the subject of this text.

9. Cayley, "Time Code Language: Poetics and Programmed Signification." I would like to reiterate that these categories are set up to describe and distinguish the usage of "code," the ways in which "code" is evoked in literal or literary art. The categories should not be considered to distinguish neatly genres or sub-genres, although they might be helpful in so doing.

10. N. Katherine Hayles, "Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis," *Poetics Today* (2001). See also: N. Katherine Hayles, "Virtual Bodies and Flickering Signifiers," *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999). and my commentaries in Cayley, "The Code Is Not the Text (Unless It Is the Text)." and Cayley, "Time Code Language: Poetics and Programmed Signification."

11. An extensive critique and discussion of this aesthetic can be found in Cayley, "The Code Is Not the Text (Unless It Is the Text)." which is, in part, as response to Cramer, "Digital Code and Literary Text." and a prequel to the present essay. My position in "The code is not the text" is, in turn, usefully examined and critiqued in Sandy Baldwin, "Process Window: Code Work, Code Aesthetics, Code Poetics," *Ergodic Poetry: A Special Issue of the Cybertext Yearbook 2002 : Publications of the Research Centre for Contemporary Culture*, eds. Loss Pequeño Glazier and John Cayley (Jyvþskylþ: University of Jyvþskylþ, 2003 forthcoming).

12. Hayles, "Print Is Flat." This quotation follows on from the passage ending "stable endurance through time" quoted above.

13. Some would write "interactions" for "transactions" here in deference to the quest for interactive media. I try to reserve interaction to describe transaction between commensurate entities. See Lev Manovich, *The Language of New Media* (Cambridge: MIT Press, 2001). for a more detailed critique of the prevalence of claims for interactivity in new media forms.

14. Freud, "A Note Upon the 'Mystic Writing-Pad'," 431. Freud's own more detailed description of the Mystic Pad follow on immediately from this citation.

15. Jacques Derrida, *Archive Fever: A Freudian Impression*, trans. Eric Prenowitz, Relgion and Postmodernism, ed. Mark C. Taylor (Chicago and London: University of Chicago Press, 1996) 14. Derrida quotes the phrase "child's toy" from his earlier essay, Derrida, "Freud and the Scene of Writing," 228.

16. Kittler, "The World of the Symbolic," 144. citing Lacan, *Seminar II*, 300.

17. Kittler, "The World of the Symbolic," 144. citing Lacan, Seminar II, 302. Kittler writes, "Lacan simply says 'circuit' and does not hesitate in equating oscillation, the master clock of every computer system, with scansion, the rhythm of intersubjective or strategic time." It is interesting that once again it is a hardware functionality of computer systems that Lacan equates with an aspect of the human culture of time, rather than imagining that these systems might themselves partake of this temporal cultivation.

18. See Daniel Tiffany, *Toy Medium: Materialism and the Modern Lyric* (Berkeley: University of California Press, 2000).

19. It is difficult to extract a brief quotation from Derrida's essay to bear this point out, but see, in particular, part I of its "Exergue," Derrida, *Archive Fever: A Freudian Impression* 8-20.

20. "I further had a suspicion that this discontinuous method of functioning of the system Pcpt.-Cs. lies at the bottom of the origin of the concept of time." Freud, "A Note Upon the 'Mystic Writing-Pad'," 434.

21. Derrida, "Freud and the Scene of Writing," 205. and the section of this essay, pp. 200-205.

22. Even in critical works devoted to the projection of personality into the virtual, such as Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Touchstone, 1997). , where the unconscious hardly gets a mention. I have commented on this omission in John Cayley, "In the Event of Text: Interview with John Cayley," *Cybertext Yearbook 2000*, eds. Markku Eskelinen and Raine Koskimaa, Publications of the Research Centre for Contemporary Culture, 68 (Jyvþskylþ: University of Jyvþskylþ, 2001) 95. and passim.

23. In fact, Raley exemplifies this tendency immediately after introducing Loseby's ideas, implicitly objecting to a representation of code as "alienating," "An art of code, though, would almost necessarily suggest that code can be beautiful instead of alienating." Raley, "Interferences: [Net.Writing] and the Practice of Codework." It could also, of course, be beautiful *and* alienating.

24. Freud's words, as quoted here by McHugh from Freud, "A Note Upon the 'Mystic Writing-Pad'," 433. recall Hayles' "flickering signifier" and may even have been an (unconscious?) influence on her choice of adjective. Note, however that encoding, particularly digital encoding, is not clearly represented by the Mystic Pad, that dwells with the technology of the engram (as Kittler remarks). Rather than a shimmering of and over encoded depths, Freud's "flickering" is a "flickering-up" and is paired with a "passing-away." This flickering and fading conjures a representation of processes, allied more with the temporally structured methods of generation and destruction which I am proposing as intrinsic to the signifiers of literal art, especially in programmable media.