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Numbered Space and Topographic Writing

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Abstract
While we have to acknowledge digital poetry as part of our current cultural moment, this acknowledgment is doomed to vagueness as long as we cannot say what digital poems are let alone adequately describe their behaviour. Alternatively, to begin this work of accounting for digital poems, I begin with the premise that the cultural trend toward the mathematicization of space has brought about the mathematicization of writing to then argue that many poems — digital as well as paper-based — that are kinetic and/or generated model themselves on mathematical modes of thinking. I see these poems reflecting thinking that is based on either Euclidean or non-Euclidean principles of mathematics—principles which can then be used to ultimately account for a variety of paper-based and digital poems that are kinetic and/or generated.

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There is something of an Emersonian-inflected pragmatism in digital poetry and in our repeated attempts to account for it (to take an accounting of it, to say how and why it counts) — I mean that we are still working through the question that Emerson dramatizes in Experience: He asks, "Where do we find ourselves?" and I would reply, after Richard Poirier, that digital poetry only reminds us that we still, a hundred and fifty years later, find ourselves "in a struggle with language — where else?" (Poirier 32) But before we go further we do need to be reminded of the obvious here — that the concerns of the bookbound are neither solved nor irrevocably past as we look into the face of the digital. Digital poets continue to attempt to exploit the medium of the word to more accurately represent our desire to have a full experience of and through language as a form of life — only now, through movement, generation, interactivity, they are able to express visually the life-like qualities of words. Like the cinematic poems that Futurists called for [1] or like the strivings of the 20th century's heritage of concrete poets, these digital works reflect, as Marie Laure Ryan puts it, dreams of a multisensory language which activates "the full semiotic potential of language," the democratization of art, the transformative power of language, the text that reflects its reader, and a language that captures the emergence of thought (14).

Critics, on the other hand, continue in their strivings to clarify this language that has the potential to be unrelentingly flexible, shifting, transforming — anything but inert words on a static page. However, while the critic must not only acknowledge the continuing lines of concerns that leap what often seems to be an unbridgeable divide between computer screen and paper-based book, they must also, given radical differences in mediums, find a way to acknowledge that this leap from the book to the digital cannot simply be a transposition of concerns. This essay, then, concerns itself

largely with the ways in which the move from the book to the digital presents challenges to the critic who must somehow account for how poets are still engaged in the same struggles with language at the same time as account for how they are grappling with language in wholly new ways — ways which render inadequate conventional tools of literary criticism. Further and more generally, another defining question driving this investigation is, as corporate consultants are now fond of asking, what is the difference that makes a difference? Otherwise put, at what point, if there is one at all, does digital poetry cross a threshold and break away from book-bound concerns, thereby also breaking away from the ways in which we normally account for texts?

My premise, then, to start the work of finding the upper-limit of the bookbound page: what is fundamental in that conceptual/perceptual shift brought on by the digital is that the digital realm offers us the opportunity to represent (not necessarily conceive of) space in different or expanded terms than that of paper-based writing; and, further, this sense of space therefore requires that we come up with a different set of literary terms for the interpretation of certain digital texts. Despite the inseparability of space and time in these digital pieces — an inseparability often marked by text that moves and unfolds in space — solely for the sake of brevity this paper will primarily center on space.

Beginning with paper-based poems, particularly those that seek to evoke movement since these works bring to the fore poets' conceptions of and attempts to manipulate space, the physical use and representation of space in, say, Wallace Stevens' The Place of the Solitaires from his 1923 book Harmonium is — in its resolute three-stanza position on the page anchored down by an invisible typographical grid — static. The poem in its entirety reads:

Let the place of the solitaires
Be a place of perpetual undulation.

Whether it be in mid-sea
On the dark, green water-wheel,
Or on the beaches,
There must be no cessation
Of motion, or of the noise of motion,
The renewal of noise
And manifold continuation;

And, most, of the motion of thought
And its restless iteration,

In the place of the solitaires,
Which is to be a place of perpetual undulation. (Stevens p. 47)

However, taking into account the sound-structure that literally and regularly undulates from "place" to "place" as the reader moves from lines one to two; the off-rhyme linking "undulation" in line two with "cessation" in line six, "continuation" in line nine, "iteration" in line 11 and returning once again to "undulation" in the final line; the syllable count that in the first four lines alone wavers from eight, to 12, to seven and back to eight syllables; the enjambment from "cessation" in line six to "Of motion" in the following line as well as the proceeding "renewal of noise" that is enjambed into "And manifold continuation;" and of course the content of the poem all reveal a conceptualization of the poem and of the space upon which it is built as in constant transformation. Moreover, in terms of the powerful pull of its prosody, this poem most certainly goes against by-now clichéd assertions about the stability of the page and the inability of print-based writing to evoke fluctuation and flexibility in the way that is supposed to be inherent to digital writing. As Stevens himself explains in The Necessary Angel:

The subject-matter of poetry is not that 'collection of solid, static objects extended in space' but the life that is lived in the scene that it composes; and so reality is not that external scene but the life that is lived in it. Reality is things as they are. The general sense of the word proliferates its special senses. It is a jungle in itself (p. 658).

Writing in 1923, Stevens had to have been influenced by current discussions about the implications of Einstein's General Theory of Relativity which finds its roots in 19th century proposals for a non-euclidean geometry denying Euclid's postulate of the indeformability of solids (meaning that, as Linda Henderson concisely puts it, "geometrical figures do not necessarily retain their shape when moved about, as Euclid and geometers for two thousand years after him had assumed they would" [p. 132]). Further, it should be pointed out that Stevens' interest in translating developments in

science and mathematics into poetry is not exceptional. William Carlos Williams, who was a friend and correspondent of Stevens, later wrote in his 1948 essay The Poem as a Field of Action, “How can we accept Einstein’s theory of relativity, affecting our very conception of the heavens about us of which poets write so much, without incorporating its essential fact — the relativity of measurements — into our category of activity: the poem. Do we think we stand outside the universe?” (p. 283). This frequently unacknowledged but yet crucial scientifico-literary history exemplified by canonical poets of the book-tradition such as Stevens and Williams not only quite clearly runs counter to the general tendency to align print with stasis and the digital with flexibility, as well as the tendency to create a neat progression from the one to the other; but it also accounts for attempts by avant-garde poets such as Marinetti, verse poets such as Stevens and later Williams, as well as contemporary concrete poets such as Eugen Gomringer to graphically represent or evoke language as an transitory and transitional object in motion.

Concrete poets are particularly obvious pre-cursors to digital poetry; unlike with Stevens, with Gomringer, for example, there is an attempt to draw attention to the materiality of both word and the medium of the page as well as an emphasis on the physicality of language, the constructedness and flexibility of meaning. In particular, Gomringer’s 1953 poem Ping Pong forces the eye to jump across and down the page at the same time as it achieves a synaesthetic effect is achieved through the simultaneous sounding out of the sing song words “ping pong.” However, similar to the way in which Stevens’ conceptualization of a poem that moves with both thought and the object of thought cannot be physically manifested on the page, ultimately the unyielding insistence of the page on stasis makes impossible the actual movement of Gomringer’s language. In other words, Stevens and Gomringer demonstrate what, as Raley puts it, “the medium allows”; no matter how artfully written or how much fluidity and flexibility are built-in as a counter to the page which is assumed to be solely static, the medium cannot literalize the message of “perpetual undulation.” However, I want to be clear that it need not be — the move toward digital kinetic poems is not one of teleological fulfillment; as I have pointed out, Stevens and Gomringer demonstrate that there is an undeniable tension between both motion and stasis — a tension that is not resolved in the digital realm so much as it is transposed and, depending on the poet, either transformed or moved into another layer of the reader/writer/text/machine interface.

Maria Mencia’s digital work, for example, Birds Singing Other Birds’ Songs, certainly does realize the paper-based dream of movement but does not go beyond a transposition of book-bound concerns. Here generic bird-figures move across the screen, outlined by or encompassing letters that periodically correspond with bird sounds in the accompanying audio. She writes by way of an introduction to her work:

The conceptual basis for the work is an exploration into the idea of the translation process: from birds’ sounds into language and back to birds’ songs via the human voice with the knowledge of language. These birds are animated ‘text birds’ singing the sound of their own text while flying in the sky. The letters, which create their physical outlines, correspond to the transcribed sound made by each of the birds.

But for all its clean aesthetic and visual appeal, Mencia’s work, which shows us the computer’s ability to fulfill the paper-based dream of kinesis (as well as synaesthesia, now called ‘multimedia’), does not bring to the fore the difference that makes a difference in the move from the book to the digital; neither does it demonstrate what the medium allows.

As Stevens and Gomringer’s work demonstrate, paper’s rigid limits to representation do make possible vague content and, along with an attention to linguistic structures, as a result it also makes possible a fluidity of thought or an experience of the poem that is not always possible with its literalization in the digital, one that turns the poem into a cinematic projection and the reader into a (sometimes passive) viewer. It easily can be claimed, for example, that “Birds Singing Other Birds Songs” is over-determined — the text spells out bird-sounds at the same time as it flies in the shape of the bird — and that it only shows us fluidity and movement at the cost of the reader/viewer’s active engagement. The poem similarly over-determines the reader/viewer’s bodily movement through the interactive features, which give the viewer the option of clicking on any of the 13 links at the bottom of the screen which in turn merely activates another cinematic word-sequence. This is interactivity not only in the most limited sense but it also requires little more physical or intellectual engagement than, say, running your thumb and forefinger along the edges of a flip-book. Moreover, all of the foregoing aspects of Mencia’s work not only address book-based concerns, but they also could be said to invite what I earlier claimed was a problematic tendency to read digital poems largely according to what they show rather than by what they do or

how they are constructed.

Once again, while Mencia's digital work does not embody the difference that makes a difference in the shift from paper to digital, I return to the premise that the construction and representation of space in the digital is still one possible fundamental differentiation between the two media. That is, it can be argued that paper-based poets' attempts, such as those by Stevens and Gomringer, to create on paper the effect of moving through language is nonetheless based upon a conception of space as homogeneous, typographically mappable and countable by one and two and three and then four — a regularized space that they seek to break out of. Moreover, it also then makes sense to understand these poems according to the established hallmarks of the page: for Stevens we could draw on the rules of prosody, rhythm, rhyme, line-breaks, and for Gomringer (who rejects the stringency imposed by such conventions of reading and writing) we could understand the poem according to arrangement on the page, and content.

But what if a poem is based upon a conception of space as "multiple, variable, and vibrant" — where the literal ground is always shifting and heterogeneous — then how are we to understand the text? Or, to put it in another way, what if the ground upon which the poem is built (and only a digital poem could accomplish this) is not Platonic—is not, as Brian Rotman puts it, an ideal realm "'out there' somewhere, existing prior to human beings and their culture, untouched by change, independent of energy and matter, beyond the confines and necessities of space and time . . ." (p. 127)? We could still try to use rhythm, rhyme, line-breaks and so on to understand the poem but only if it were assumed that the resulting reading would be utterly contingent and, since the text could completely change in only a brief moment, such a reading would also ultimately tell us very little about the poem — or it would only tell us that it is comprised of uncountable difference.

However, before I go on to address the ways in which I see certain developments in mathematics accounting for these shifting texts, it is crucial to reiterate a point I made earlier — that it is untenable to simply set up a dichotomy between paper/digital and static/fluid space. Since paper-based and digital poems are equally capable of building on stasis as well as fluidity, our attention instead must be attuned to the way in which this tension is worked out in each respective medium and whether the text successfully takes advantage of the fundamental differences that each medium offers. Susan Howe's work, for example, which comes out of a lineage of typographically experimental writing beginning with Futurists such as F.T. Marinetti and moving up through Charles Olson and other concrete poets more radical than Gomringer, immediately troubles such easy formulations. In particular, poems from her 1989 book The Nonconformist's Memorial are based on both a regular, what I have called "typographically mappable," space and a shifting, heterogeneous space to the extent that there are words and phrases that can be conventionally read because of a numerically enforced regularity between the letters and words; and there are also words and phrases that are upside-down, backwards, angled up or down the page, and even illegible in such a way that (forcibly) creates an antinomian textual space in opposition to the law of the page. But, even though there are multiple viewpoints and fractured spaces built into such poems as Howe's, they are still written against the backdrop of a fundamental fixity that may be overcome through activation or animation in the digital medium (as in the case of Mencia's work) only then to be re-instated at the level of the code or program — again, begging the question of whether the appearance of movement in the digital poem represents a decisive point of difference. A more full account of such ratios of fixed and fluid space in paper-based and digital poems emerges, however, once we look at developments in mathematics and geometry which are at the heart of the space of writing [2].

To begin with, while the typography of paper-based poems — the unseen foundation of the page — is a precise science based on a carefully mapped and numbered writing space, there is also nothing about computer typography that is not wholly mathematical: from the programs themselves that are based on the binary logic of zeroes and ones to the pixels, making visible the letters, which are defined by their X and Y coordinates and their gray level commonly expressed by binary numbers. But to understand more precisely the nature of these two mathematicized spaces, for the moment it is instructive to turn from poems who evoke or embody movement in space to those whose very processes are explicitly modeled on mathematical modes of thinking.

In particular, taking my cue again from Brian Rotman, I see operating in many computer-mediated and/or generated poems in addition to paper-based and/or generated poems two modes of thinking that are based on either Euclidean or

non-Euclidean principles. In Mathematics as Sign: Writing, Imagining, Counting, Brian Rotman provides (more for the literary than for the mathematical reader) clear definitions of these two terms to make his argument that mathematics is a form of writing that bears with it the possibility of accounting for the writer (or the counter) and so rather than be an activity of accessing and mapping transcendent space, Rotman proposes a way of thinking about numbers, counting and mathematics that is a kind of embodied activity. Euclidean counting, then, emerges out of Euclid's principles of geometry which are based on the premise that "points and lines are supposed to reside on an infinitely extended, already existent, everywhere identical plane" (p. 130). In other words, Euclidean counting is the way we normally count; as Rotman puts it, our everyway way of counting is Euclidean "because it rests on the Platonic idea of numbers as an already existent, infinitely extended series of objects, each different from its neighbor by an identical unit. It treats all numbers, even the impossibly large ones, as if they behaved exactly the way the familiar, local numbers do . . ." (p. 131).

Raymond Queneau's mathematically-inspired poetical work Cent Mille Milliards de Poémes is particularly notorious for taking a fidelity to mathematical principles to its logical extreme; from my perspective, however, it is an exact representation of a poem produced by Euclidean mathematics. Oulipo methods of generating poems — originally paper-based and often using impossibly large operations — were among the first to be literalized with a computer. Founded in 1960 by a group of French writers and mathematicians, Oulipo openly and systematically uses the mathematics of, for example, Boole and Fibonacci, to create poems. As Jacques Roubaud puts it, the aim is "to comport oneself toward language as if the latter could be mathematized; and language can be mathematized, moreover, in a very specific fashion . . ." (Motte p. 82). As such, the rigid set of rules at the heart of Queneau's work (a matrix of 10 sonnets which generate 100 trillion poems) along with its unreadability — as Queneau himself puts it, if one read a sonnet per minute, eight hours a day, 200 days per year, it would take more than a million centuries to finish the text — make it an odd variation on post 19th century anti-romantic poetics. For while it is clearly opposed to the notion of divinely inspired creative genius (as the inspiration is purely mechanical), its mathematics is still based on Platonic objectivism in which there is a clear separation between mathematics and the one using the mathematics. In other words, Queneau simply sees himself as carrying out, by way of language, operations based on a stable reality of mathematics that exists, unlike Queneau himself, apart from the space and time of its creation and which therefore makes possible the concept of an infinite text — or a text that, in consisting of 100 trillion poems, might as well be infinite.

This attraction to using poetry as the handmaiden of Euclidean mathematics is only partly ironic, for against what they see as an anti-mathematical, anti-mechanical prejudice in literature that goes back at least as far as the Romantics, at the heart of the Oulipo enterprise is the desire to recuperate the ancient belief that there is an analogy of mathematics and literature. Moreover, this use of mathematics to make clear its analogy to literature is not limited to an older generation of writers for it has been rigorously taken up by contemporary writers thoroughly ensconced in digital culture. Simon Biggs, for example, in his 2003 "web art" work Book of Books, clearly sees language and machines as intertwined. As he writes in Computing the Sublime, ". . . it can be established that the computer is firstly a language machine. It is a machine that is formed with language (symbolically) and which operates as a semiosis, perhaps sometimes as a form of poesis, on language." However, despite his mention of semiosis, in Book of Books this vision of the intertwining of language and machine is not in the sense of how they are both socially situated and culturally constructed, but in the sense that language, like mathematics, is a tool to be used, a tool entirely separate from its users.

Book of Books is comprised of three parts: Book of Books I, Book of Books II, and This is Not a Hypertext; the most predominant theme it builds on is the notion that given enough energy and enough time, eventually any work, even the works of Shakespeare, could be written using random generating methods or combinatory mathematics. In his artist's statement Biggs writes:

Rather than monkeys typing we have a computer program tirelessly generating random words and inserting them into the resulting ever expanding text . . . we can imagine that this system might, given an infinite period of time and processing power, generate such a book ... Eventually, after a reasonable period of time . . . the text is reduced to a one pixel font size at which point it resembles our new universal language, binary code. All languages are thus seen to be one and the same in a demonstration of what the term convergence media might really imply, as the erasure

of difference leads to the text becoming unreadable.

What is so curious about this statement is that on the one hand the pieces of Book of Books show language, like numbers in Euclidean arithmetic, as an infinite plane of possibility that, again, exists apart from the vagaries of space, time, and users. But on the other hand, while Book of Books might appear to triumphantly represent the mathematicization of space that the computer offers us, the ultimate unreadability of Biggs' texts seems in fact to point to a desire not just for language itself but for language to remain untouched by the zeroes and ones of an encroaching digitalization. However, whether this work can indeed be read as more than the crowning achievement of a Euclidean mathematicization of space and writing, and more like a warning against the desire for such an achievement, the text still remains firmly grounded in its own terms: in other words, the call to retain difference in language and the illustration of the impossibility of fully mathematicizing language say nothing about what difference should be based on, how difference is conceived, why language should be exempt from mathematicization; in fact, if anything, it seems to point to the inevitability of language and mathematics being intertwined and so the question more properly seems to be what kind of mathematics should be intertwined with language.

The alternative to the Euclidean mathematics that underlies both Queneau and Biggs I call, again after Rotman, non-Euclidean. This use of mathematics to map space and writing emerges out of the discoveries by 19th century mathematicians which run counter to Euclid's fifth postulate: given a straight line and a point not on this line, there exists exactly one straight line through the point parallel to the first line. Mathematicians such as Nikolai Lobachevsky instead claimed there are many lines while Georg Riemann claimed there are no parallel lines. The effect of such discoveries was "enough to shatter the idea that the Euclidean plane was some kind of uniquely privileged Platonic realm" (Rotman p. 130). Non-Euclidean counting, then, not only rejects Platonic ideas about numbers by rejecting the concept of an ideal realm of numbers that is constant, homogeneous, pre-existing and separate from human counters, but it also, therefore, places itself in opposition to concepts of infinity, transcendence, stasis, absolutes, and binary distinctions such as mind body, mind and matter. Unlike conventional mathematics which postulates an ideal counter that not only can count (in some transcendent realm) ad infinitum but whose counting will always be the same ad infinitum, non-Euclidean counting acknowledges that counting is done by humans with real, earth-bound limits.

Moving away from work that is explicitly mathematical to work that is so implicitly, Lori Talley and Judd Morrissey's 2002 work, The Jew's Daughter, is a strong example of such a use of space and counting. Unlike most hypertextual works which often sell themselves as endless narratives whose story can be plotted by the active reader (and such a multi-plot story that goes on ad infinitum makes it a close relative of the combinatory works of Queneau and Biggs), Talley and Morrissey have created a poetic work that is fluid in a double sense: while it can incorporate decisions on behalf of the user/reader, they intentionally make it clear that this interactivity only goes so far, that decisions have been and are made by the author/programmers. Specifically, while there are highlighted words (rather than links) on each page, the reader/user is deprived of that empowering click of the mouse and instead, the moment the cursor moves over the highlighted word, parts of the text are changed. The result: a finite text whose two-hundred twenty-five sections are always just out of reach, and one that, unlike Biggs' unreachable, unreadable, seemingly autonomous text-generating machine, foregrounds its creation by intending, decision-making authors. Echoing a passage quoted in a recent New York Times review of their work, here "Words are always only real-time creation" (Mirapaul). One of the points of this paper is that underlying any writing is a conception of the space in which it takes place, and any conception of space is bound by a conception of how that space is mapped, numbered, counted. As such, while mathematics does not obviously play into The Jew's Daughter, the embedded or hidden programming which becomes explicit in the structure of the work is one whose counting appears to be earthbound rather than transcendent, limited rather than infinite, made rather than pre-determined. It is also worth noting that Talley and Morrissey's work by necessity contains certain limits and strictures alongside the ability to go beyond these limits through a sophisticated interactivity — thereby demonstrating a transformation or fundamental alteration of the ratio of rigid and fluid space typical of book-bound works.

It seems to me, then, that while the strings of zeroes and ones that undergird the digital might suggest that its extreme rigidity (which arguably surpasses that of paper) in some cases only makes possible the illusion of a poem whose space and time is flexible, shifting, moving, in fact this very rigidity offers the opportunity for artists to take advantage of emergent behavior based on principles suggested by non-Euclidean

counting. Despite his bias toward fiction and computer-generated games, Espen Aarseth may in fact have been right to exhort writers to work towards “simulated worlds with emergent intrigants” (p. 141) as this is undoubtedly one of the key differences that makes a difference: rather than representing, say, Stevens’ or Gomringer’s paper-based dream of a moving, interactive, and computable language (as exemplified by Mencia’s and Biggs’ work), the digital makes possible another version of language itself — through a deep engagement with movement, interactivity and computation, language itself can emerge, evolve, behave, transform out of its rigid basis and in tandem with the language-user. In other words, the digital makes possible not just the representation of language as a form of life, but it opens the door to language becoming a form of artificial life.

Artificial intelligence and Artificial Life are two areas of inquiry which, through the intersection of complex algorithms and computing, have long since attracted artists interested in creating sophisticated interactive works that simulate or model complex behavior or evolutionary processes. The sculptor Ken Rinaldo for instance writes in his essay Technology Recapitulates Phylogeny:

With artificial-life programming techniques, for the first time interactivity may indeed come into its full splendour, as the computer and its attendant machine will be able to evolve relationships with each viewer individually and the (inter) part of interactivity will really acknowledge the viewer/participant. This may finally be a cybernetic ballet of experience, with the computer/machine and viewer/participant involved in a grand dance of one sensing and responding to the other.

Despite an attunement to the dynamic between the word, its medium and materiality along with an awareness of the flexibility of signifier and signified that has exemplified innovative poetry since (at least) the early 20th century, poets, however, have generally been slow to turn away from a paper-bound imagination and take full advantage of what the digital medium allows: among others, the use of a flexible and transformative space through sophisticated interactivity — qualities made possible by advances in Artificial Life — which can be built into the poem. Moreover, such a turn in poetic practice that the digital invites is one that, as I mentioned earlier, makes possible dwelling in or alongside the virtual reality of language as a form of life complete with (emergent) behavior.

John Cayley is undoubtedly another exception to what I am calling paper-bound thinking: his work has evolved from an engagement with interactivity through movement, co-creation and continuous generation in, for example, his early work Indra’s Net [3] to such recent (and also unfinished) works as overboard and What We Will. Cayley writes of overboard: “There is a stable text underlying its continuously changing display and this text may occasionally rise to the surface of normal legibility in its entirety. However, overboard is installed as a dynamic linguistic ‘wall-hanging,’ an ever-moving ‘language painting.’” Through a series of algorithms designed to allow letters to be replaced by other similarly shaped letters, the text drifts in and out of a constantly renewable, periodically emergent legibility — one that the reader has the option to preserve or recover. In this way its space (and of course time) are simultaneously rigid and flexible from both the perspective of the reader and the writer — a reader and writer that may finally be the reader-writer prematurely hailed by early hypertext theorists like Joyce and Landow. What We Will similarly incorporates randomness and open-endedness but it does so by taking advantage of the cinematic qualities that the computer/screen offers: by way of an interactive movie format complete with photographic panoramas, it is a navigable movie in which human drama and literary arts merge and the reader can explore this nonlinear, synaesthetic text. In more technical terms, Cayley describes this work as follows:

. . . What We Will provides the user with a configuration of interactive photographic panoramas and topographically associated aural and musical soundscapes in binaural stereo. Apart from navigation around the panoramas — around locations of the city associated with the characters — linked hotspots give access to other related panoramas and secret ‘whispers.’ The literal and synaesthetic ‘whispering’ graffiti of the locations and their panoramic surrounds generate a rich affective structure of image, music and text.

But now we have arrived at a possible threshold difference between a paper-based poem such as Stevens’ The Place of the Solitaires and Cayley’s overboard or What We Will, this difference in fact seems not just to dissolve the boundaries between poetry and other genres such as music, photography, visual art and even science, but to do away altogether with our accustomed ways of understanding and interpreting texts from the starting-point of genre (in other words we cannot interpret or understand a poem until we can say it is in fact a poem). Could it be it is not just, as I claimed

earlier, that the model of space that digital poems offer us require that we come up with a different set of literary terms for their interpretation but, more fundamentally, that the very concept of poetic practice (both the reading and the writing of poetry) is changing to one of a literary scientific researcher and a scientific literary researcher? Or could it be that what may immediately be recognized as a poem digitally engaged with literary precedents such as procedural poetry, visual poetry, poetry based on a philosophy of embodiment or "reformed empiricism" (to once again sound a note of Emersonian pragmatism) in fact should be seen as creating a fluctuating linguistic "fitness" landscape in which both reader and text mutate, adapt, and evolve as digital organisms? The answers to these questions are far from being answered not only because they so uproot our sense of the parameters of the literary, but also because finding answers would require wholly reconceiving such parameters in order just to begin to find our words again, just to name 'it' before we can say what it is.

References and Notes

1. Eerily pre-dating the digital's capacity to mobilize language, F.T. Marinnetti declares that ". . . we prefer to express ourselves through the cinema, through great tables of words-in-freedom and mobile illuminated signs" (Apollonio p. 207) and further, that Futurist films will have "[c]inematic simultaneity and interpenetration of different times and places. We shall project two or three different visual episodes at the same time, one next to the other . . . Filmed words-in-freedom (synoptic tables of lyric values – dramas of humanized or animated letters – orthographic dramas – typographical dramas – geometric dramas – numeric sensibility, etc.) . . ." (p. 218).

2. For a historical survey of the relationship between numeracy, writing, and the representation of space see Michael Hobart and Zachary Schiffman's Information Ages: Literacy, Numeracy, and the Computer Revolution.

3. This is an argument I have already made about both John Cayley and Kenneth Goldsmith's work in "Digital Poetry as Reflexive Embodiment" in Cybertext Yearbook, p. 88-106 (2002-2003).

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