Aesthetic Animism:
Digital Poetry as Ontological Probe

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SIGNATURES

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ABSTRACT

Aesthetic Animism:
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This thesis is about the poetic edge of language and technology. It inter-relates both computational creation and poetic reception by analysing typographic animation softwares and meditating (speculatively) on a future malleable language that possesses the quality of being (and is implicitly perceived as) alive. As such it is a composite document: a philosophical and practice-based exploration of how computers are transforming literature, an ontological meditation on life and language, and a contribution to software studies. Digital poetry introduces animation, dimensionality and metadata into literary discourse. This necessitates new terminology; an acronym for *Textual Audio-Visual Interactivity* is proposed: *Tavit*. *Tavits* (malleable digital text) are tactile and responsive in ways that emulate living entities. They can possess dimensionality, memory, flocking, kinematics, surface reflectivity, collision detection, and responsiveness to touch, etc…. Life-like tactile *tavits* involve information that is not only semantic or syntactic, but also audible, imagistic and interactive. Reading mediated language-art requires an expanded set of critical, practical and discourse tools, and an awareness of the historical continuum that anticipates this expansion. The ontological and temporal design implications of *tavits* are supported with case-studies of two commercial typographic-animation softwares and one custom software (Mr Softie created at OBX Labs, Concordia) used during a research-creation process.

ACKNOWLEDGEMENTS

I am indebted to my thesis advisers for their assistance during this process. I am grateful for their guidance, astute experience and extreme candidness. Errors or excesses remain mine.

Inundated in information, in the age of the internet it is certain that many ideas in this thesis were first expressed elsewhere. I have tried wherever possible to cite all sources, but it is probable that the pioneering work done by many thinkers (among them Jay David Bolter, Richard Lanham, Johanna Drucker, Katherine Hayles, Loss Pequeño Glazier, Bill Seaman, Stephanie Strickland, Eduardo Kac, Eric Vos, Christopher Funkhouser, John Cayley, Francisco Ricardo, Charles Hartman and many many others) has seeped into my mind.

In addition, the following people each at some time proved themselves invaluable in offering encouragement: Rita Raley, Jake Moore, Anke Burger, Chris Funkhouser, Amy Hufnagel, Laura Emelianoff, Vasilios Demetrious, Skawennati, Jessica Pressman, Davin Heckman, Jim Andrews, J.R. Carpenter, Daniel Canty, TBone, Stephanie Beliveau, Bruno Nadeau, Patrice Fortier, Erin Manning and Frances Foster. Big thanks to Lazarus for listening to my doubts and offering good sensible counsel. Bina Freiwald for indefatigable grace and encouragement. And a huge thanks to Stephanie Strickland for her fastidious editorial eye which helped me immeasurably.

During my research work I was given the opportunity to exhibit by Oboro, BNL de Montreal 2011, ELO @ Brown 2010, e-Poetry 2011, Fais Ta Valise, Beluga Studios and NT2. Such opportunities to place online work into physical contexts provide valuable perspective.

I need to thank my family, especially Mom, for continual support. And lastly Sophie Jodoin who saw me through this intellectual rite of passage.

DEDICATED

To

my neighbour
Laurie Walker

and my
gentle stepfather
Murray Thorner

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How can this document be read?

In this era of compressed attention, the following information might prove useful.

Chapter 1 **outlines** the general argument: it provides an overview of the subject of digital poetry and the approach. The terms ***tavs and tavits*** **are defined**.

Chapter 2 presents a **history of precedents**, typographic explorers, previous movements and parallel practitioners: it presents an in-depth contextualizing continuum. It also creates **a foundation for what follows** by proposing that, in some computational contexts, images assimilate text.

Chapter 3 contains **central arguments**. These concern the plausibility of living language as an outcome of the convergence of literature and computation, the volumetric possibility that archetypal letterforms relate to internal physiognomy, and discourse on how these archetypal forms might be attained in ways that are both synaesthetic and synergetic.

Chapter 4 concentrates on **software-studies**. Three software use-case studies explore the temporal implications of timelines on the literary imagination.

Chapter 5 **concludes by linking** the software-studies (temporal arguments) to the animism arguments and places both within the context of preverbal apprehensions and the roots of semantics. It also proposes a vectoral model for conceiving of text-sound-image synthesis in terms of interior-between-exterior.

What is Digital Poetry?

- **a compression utility** (it converts paragraphs into tiny enigmatic phrases)
- **a Memory Resource Unit** (inducing long-term potentiation from the cruft and spam of experience)
- **GPU accelerated lyricism** (lamentations & celebrations with some multimedia)
- **a translation algorithm** (converting the cultural heritage of bards into interactive & generative formats)

Preface

> "The first who likened painting and poetry to each other must have been a man of delicate perception, who found that both arts affected him in a similar manner. Both, he realized, present to us appearance as reality, absent things as present; both deceive, and the deceit of either is pleasing.
>
> A second sought to penetrate to the essence of the pleasure and discovered that in both it flows from one source. Beauty, the conception of which we at first derive from bodily objects, has general rules which can be applied to various things: to actions, to thoughts, as well as to forms.
>
> A third, who reflected on the value and the application of these general rules, observed that some of them were predominant rather in painting, others rather in poetry; that, therefore, in the latter poetry could help out painting, in the former painting help out poetry, with illustrations and examples.
>
> The first was the amateur; the second the philosopher; the third the critic."
>
> Gotthold Ephraim Lessing.
> *Laocoön: An Essay on the Limits of Painting and Poetry* (1766)[1]

The relationship between poetry and painting is ancient. Digital poetry compounds the relative complexity of this relation by adding sound and interactivity to the situation. Digital media introduces a fourth perspective not listed by Lessing (quotation above): the perspective of an artist involved in the creation of works that are hybrid entities: poetry + painting + soundscapes + programming.

In spite of the longevity of the arts, I am an artist-taking-refuge-in-academia who is in agreement with the sentiment of Alan Sondheim's casual proclamation at ELO 2010,

[1] http://ebooks.cambridge.org/chapter.jsf?bid=CBO9780511803734&cid=CBO9780511803734A010

"Everything we do here will be irrelevant in a few years."[2]The reasons for this irrelevance are so well-known they scarcely bear iteration. Nonetheless, I will briefly state a few. Humans are a tiny species on a tiny planet in a vast universe. Collectively knowledge is growing at unprecedented logarithmically-accelerating rates. Distribution technology and softwares modulate as swiftly as weather. Skills that might have been absorbed as a journeyman apprentice and passed down through generations are now eclipsed in less than decades. Definitions and cultural practices fluctuate like seaweed in a hurricane. Certainties are uprooted.

What remains to be said? Hurricane navigation involves an awareness of where the storm is, and an ability to keep the ship pointed into the wind. This thesis attempts to do a bit of both: it looks at the current state of contemporary digital poetry and extrapolates toward the future. It also offers *satellite* imagery of specific aspects of the cyclone afflicting/uplifting painting(video) and poetry(programming). And it explores transformations within literary creative practice that occur as it hybridizes. It also gives an account of an ongoing transformation in the tools and technology of poetry, a storm that has thrown together formerly disparate disciplines into a tumbled heap of fertile wrack. From this confusion, very few certainties can be offered but many provocative possibilities, fractures and tangents, emerge: language-art is recursive and resilient even as it mutates.

[2]A comment captured on video by myself in *51 RESPONSES: "What inspired you to get involved with digital literature?*"http://vimeo.com/16755297

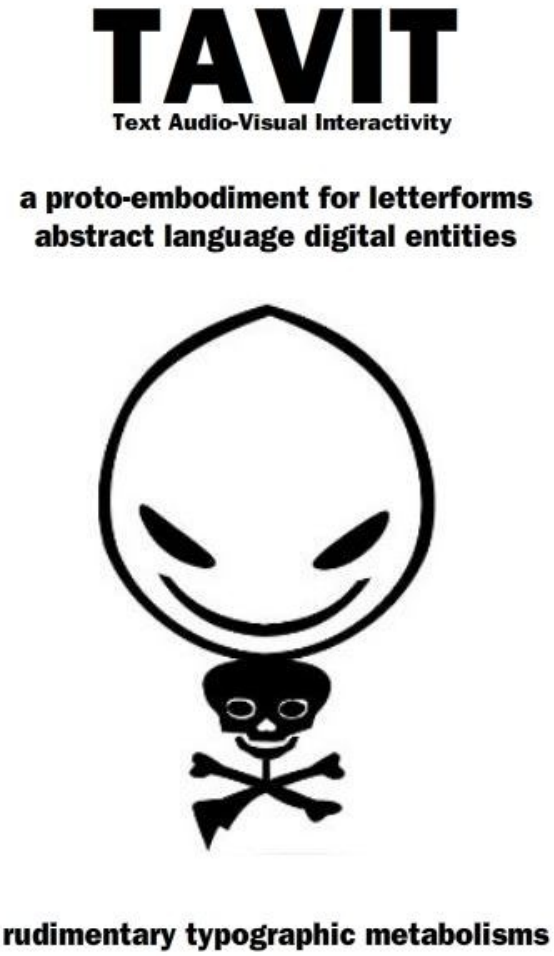
CHAPTER 1: **INTRODUCTION**

AESTHETIC ANIMISM This thesis addresses the relation between animation and animism in digital poetry that utilizes malleable typography. It introduces the term *aesthetic animism* to describe attribution of aliveness based on perceived beauty: a combination of motion, belonging, intention and appropriateness. And it explores the ontological implications of malleable typography for creative practitioners and viewer-readers of digital poetry. Through empirical software case-studies it argues for software instruments that permit digital-poets to manipulate typography sculpturally and directly.

DIGITAL POETRY is a multimedia hybrid language-art-form. It is a subset of visual language that is now fusing with digital technology and is increasingly mediated by networks. Contemporary poems are animated within GUIs and interfaces; and they often utilize dynamic interactive typography superimposed over video, generative or 3D environments. A brief list of the disciplines involved in the creation of digital poetry includes visual art, sound composition, literature, media studies and computer programming.

NEW TERMINOLOGY The multimedia aspect of digital poetry means that the term 'text' is insufficient. Future theorists will require terminology specific to the domain. I suggest *tav* (text-audio-visual), *tavt* (a *tav* in a 3D territory), and *tavit* (an interactive *tavt*). I have no illusions or expectations that these terms will achieve widespread adoption, but am certain that some terms like these will of necessity emerge to concisely and accurately convey the difference between text, tav, tavt and tavit.

TAVIT entails a proto-embodiment for letterforms; abstract language made into digital entities, typography given rudimentary metabolism. The technical methods of working with language have changed radically in the last few decades. Digital poetry offers insights and implications into this rapidly accelerating transition.



1.1 What is this thesis about

This thesis is about ontological transitions of language in mediated environments.

Ontology stems from the Greek verb ontic: of being. It is the study of what exists, what is real, and what has come to be accepted as being real. Language is becoming visually and palpably different from what it was prior to computation. New means of expression are emerging. I explore what this means for the reception of poetry. Poetry is crossing an ontological membrane from being an abstract printed system to becoming a system of quasi-entities: words and phrases that are dimensional, kinetic, interactive, code-full, context-aware and tactile. I claim that some of the independent elements of future languages will be perceived as if they were organisms.

This thesis is also an unfinished story told through the lens of an ongoing digital poetry practice that is occurring during a period of entropic technological change. Some of it (of necessity, contingent and speculative) is a meditation on how language (an abstract discursive semiotic structure) evolves in tandem with images (representational processes tightly intertwined with technology). It is also a practitioner's journal that offers a critique of software design's implicit teleologies. As such, while striving to be clear, I offer probes rather than impeccably safe logic.

The era we are living in lends itself to large claims. Yet I attempt to temper vast claims with common sense and empirical examples so as to suggest plausible pathways for digital poetry. Speculative hypotheses act as probes, they make no claim to be certain fact derived from quantitative evidence.

In short, this thesis is about the poetic edge of language and technology.

1.1.1 Precedents

> "Ces arbres reposent sur une arborescence complexe composée des lettres de l'alphabet."[These trees consist of complex arboreal structures composed of letters.]
>
> Cyrille Henry. *Verbiage Végétal*.

The link between poetry and animism is ancient: oral poetry arose in the mouths of oracles who read messages in matter. Advertising has used life-like mobile text for

decades. And I am far from the first to link animation and animism. Animation has been referred to by Cholodenko as the 'illusion of life' by the Lumière brothers, Walt Disney and Orson Welles. Etymologically animation is either endowing with *movement* or endowing with *life (*Cholodenko. 1991). I am also not the first to link digitally animated text to notions of aliveness. Jason Lewis and Alex Weyers' *Active Text* (1999) prototype application was called *It's Alive*!

Animism permeates the implicit philosophical approach of many projects. Example: Cyrille Henry's 2007 art work *Verbiage Végétal*[3] draws trees out of words drawn from internet *branchings*. The result is static images, but these represent fossils of a vibrant information ecology.

1.1.2 Strategies

> "… visual/typographic/written (and by extension, verbal) styles encode history, identity, and cultural value at the primary level of the mark/letter/physical support … "
>
> Johanna Drucker. *Figuring the Word.*(213)

In my research, I utilize both empirical and interpretive strategies. Empirically, I create digital poems and analyze the authoring environments involved in their creation; interpretively, I am examining the ontological implications of language that emulates life-forms.

My **empirical** research-creation practice involves working with (and coding within) diverse softwares, creating and exhibiting (both physically and online) digitally-mediated language-art. Based on this creative practice, I critique the timeline. Timelines are a design feature of all contemporary animation software interfaces; they define and imply a temporal model; yet the impact of the timeline's teleology on creative practice remains largely unexplored. I explore these temporal-design questions by juxtaposing

[3] Cyrille Henry. *Verbiage Végétal*.http://drpichon.free.fr/ch/article.php?id_article=80

commercial softwares with the custom typographic-animation software *Mr. Softie* created at Concordia in Jason Lewis' OBX lab. This work is part of a recent branch of media theory called *speculative computing* (proposed by Johanna Drucker in 2009) which explores the co-emergence of art, theory and interface implementations.

My **interpretive** research examines the literary, aesthetic and ontological implications of digital poetry, specifically the effect/affect of digitally-mediated language-art (which is now malleable, kinetic, reactive, audible and tangible) on collective attitudes toward life. This is what I call the *turn toward living language*. The migration of language from flat-page to interactive screen has already been widely discussed in the critical literature; yet, a semiotic system for interpreting multimedia tactile language-art does not yet exist. I review previous proposals for interpreting multimedia language art[4]; and propose a new set of terms (*tav, tavt*, *tavit*) for interactive-audio-visual-texts. Ontologically, I explore how mediated language is blurring fundamental distinctions between animate life and inanimate or mediated matter. I reflect these speculations through the lens of digital poetry, analysing how it is written, published and read (both in private and performatively). The results of these meditations challenge conventional definitions of life and suggest that mediated language is more than visual language, -- it is a quasi-entity,-- and this change has crucial ramifications for human society.

My exploration starts by examining paper poetry and language-art installation, then it examines digital poetry in time-based media which either *possesses dimensionality, moves credibly, reacts appropriately*[5]*,* and/or *displays life-like characteristics* (i.e. it likes the mouse, it remembers users habits, it may disappear/die). The final segment of analysis concerns how the works were created: how does software design implicitly

[4] Specifically, a review of Eduardo Kac's notion of the *fluid sign*

[5]Defining what constitutes credible and/or appropriate motion and reactivity is an impossible task. Subjective definitions and cultural pressures are fluid chaotic pressures. But at some level, there is an instinctive shared space where a group of people can be in agreement: yes, that's it. I use the terms live/die credible/appropriate to refer to a consensual moment not an absolute.

impede and/or aid the development of living language?

1.2 What is Software-Studies?

> "…if we want to understand contemporary techniques of control, communication, representation, simulation, analysis, decision-making, memory, vision, writing, and interaction, our analysis can't be complete until we consider this software layer."
>
> Lev Manovich. *Software Takes Over*. (8. 2008.Draft.)

Software-studies is a relatively recent field. The terms *software studies* and *software theory* were used for the first time by Lev Manovich in his 2001 book (written in 1999) *The Language of New Media.* In 2006, Matthew Fuller (at the first Software *Studies Workshop)* claimed that "all intellectual work is now software study"[6]. Scholarship on new media, that previously examined creative products of computation, now examines processes underlying computation from a cultural perspective. It is a classic disciplinary turn, self-reflexivity in action: an analysis shift from product to process. In Noah Wardrip-Fruin's *Expressive Processing*, (the first of MIT Press *Software Studies* series) the preface proposes software studies as a "fundamentally transdisciplinary computational literacy". It thinks "about the *relationship* between the audience's experience and the system's internal operations"(p.11). Wardrip-Fruin delineates two levels of expressive processing: one, authorial expression and two, design history (p. 3-5). Both types of analysis are examined in this thesis.

1.2.1 Practice-Led Software-Studies

> "Any time you give artists powerful new tools, new artistic visions inevitably spring from them. And that's what art is all about…"
>
> Robert Kendall. 1996. Hypertext listserv (in Funkhouser. Pg. 2)

Practice-led software-studies occur at an empirical level, exploring how idiosyncrasies of

[6] The preceding references are from Manovich himself in the introductory paragraphs of drafts of his new book *Software Takes Over.* The original citation in *The Language of New Media* is*: "*From media studies, we move to something which can be called software studies; from media theory — to software theory."

different software interfaces contribute to creative processes. In relation to software studies, Manovich states: “we need a new methodology. That is, it helps to practice what one writes about” (8). A practice-based iterative research-creation implies *practice-led software-studies*.

As tools, both language and software tend to operate transparently, that is, as competence accumulates, we are less and less aware of the tools as tools. *Practice-led software-studies* must mitigate against this tendency in order to reveal the implicit biases imposed by the tools. In this thesis, I focus on one specific feature of animation software, the timeline, to offer a critique of how this design-feature imposes a temporal model that negates instrumentality. This claim will be outlined in detail below, in short, I feel there is a cohesive interplay between the mechanics of tasks (and how tasks are structured by design metaphors) and how large-scale cosmologies (like a concept of time as unilinear) reinforce themselves until (they become?) paradigms.

Tools suited and specific to living language will emerge through critiques of the software we use now. In the next section, I open the idea of what living language is, in order to motivate the discussion and later detail what affordances it requires at the software level.

1.3 The Turn toward Living Language

> “In my earliest years I realised life consisted of two contradictory elements. One was words, which could change the world; the other was the world itself, which had nothing to do with words.”
>
> Yukio Mishima, in *Mishima: A Life in Four Chapters* (Schrader, 1985).

Richard Rorty[7] identified philosophy as a series of turns. Like the head of a small bird, the head of philosophy pivots to find new concerns each generation. In the early

[7] Rorty, R. (1979). *Philosophy and the Mirror of Nature*. Princeton: Princeton University Press.

twentieth century, Wittgenstein's *linguistic turn* precipitated a concentration on language as fundamental metaphor. In 1994, the *pictorial* turn (of W.J.T.. Mitchell) proposed a visual generation, ocular-centric and inundated in photons. The *pictorial* turn is living in parallel competition (and partial completion) with many other concurrent turns: the *media* turn, the *hybrid* turn, the *non-linear* turn, the *interactive-tangible* turn, the *agency* turn, the *augmented* turn and the *network* turn. This thesis concerns an interdisciplinary space where these turns are converging.

It is my feeling that the primary turns of the 20th century (*language, pictorial, media*) are converging around the concept of *life* (which invokes unresolved questions of *agency, determinism,* and *ethics)*. An unprecedented capacity for 3D rendering (representations of life) parallels biomedical manipulation and development of genetic organisms. In both cases (3D and genetics), code (computational and biological) is at the core of these endeavours. Code is structured language; metaphorically and culturally, emergent properties arise as functions scaffold on insights into the structure of language. Life, in this sense, seems a by-product of language. So there is a confluence where *language* and *life* intermingle at a functional level and in popular imagination: both new-media 3D-representations[8] and biologically-constructed life arise from manipulations of structured language.

Poetry's traditional concerns (how to structure language that is expressive) and contemporary preoccupations (how to investigate language as a structure) implicate it in life processes both experientally and formally. It is from this theoretical convergence that I suspect digital media, and digital poetry specifically is ripe for a re-turn toward *aesthetic animism*, an animism without precedent, a digital animism that includes language as a proto-animal. This will be the turn toward *living language*[9].

[8]The words 3D or three-dimensional have recently with the introduction of 3D cameras and screens become problematic. In the context of this essay, I am using the terms to refer to 3D models that occur on 2D screens (not 3D TV etc..).

[9]After writing this passage, I read the following passage in Manovich: "a new trend within metamedium

Living language will occur when digital audio-visual-tactile environments (used in the distribution of language) blend into reality[10]. It is precisely because of ordinary cognition's limited self-reflexivity that mediated language will seem to live. I am not proposing some penultimate revolutionary change in all of human culture. Rather, a subtle perhaps implicit shift in the collective notions of what entails life. My claim is that collective beliefs about what is alive will distend slightly to include (the formerly abstract entities known as) letterforms. This change will occur, slowly (over decades?) and elaborately, as computational cognitive emulations gain the capacity to communicate in nuanced modes[11].

How exactly might this ontological transition occur at a technical level? As digital files around us accumulate complex nets of contextual metadata, these meta-data structures will (like bodies) fill with *memories* (structured traces that represent past events). When words, phrases, sentences, paragraphs and books are transmitted in digital networks, they become data-structures. Network packets contain header files, which accumulate data about where they have been; this meta-data functions as memory. If *meta-data memories* (organized hierarchically and recursively attached at the level of glyph, word, phrase, paragraph, article, corpus, etc...) plug into a distributed intelligence (networked software), then simple phrases will be able to tell us who said them (and where and when), who first wrote them, who modified them. This form of interaction will deepen

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evolution which has been becoming increasingly important from the early 2000s onwards: a joining between text, image, and video and spatial representations such as GPS coordinates, maps, and satellite photography – a trend which a German media historian and theorist Tristan Thielmann called 'a spatial turn.'" (Pg. 107. 2008 Draft)

[10] I recognize that claiming anything is *indiscernible from reality* is untenable. First objection: what is reality? Second: How can such a subjective field be ascertained? But in practical terms, at a common sense level, reality is a consensually agreed upon zone, a space where things happen, where facts occur. AR, and other forms of mobile overlay of *reality* with informational content, rely on the willingness of the observer to absorb and accept data as an aspect of space. It is this slow insidious process that is at the core of the conversion of *reality* from a simple singular objective notion into a networked shared and asynchronous space where residues and traces emitted by collective passage confound any easy generalizations and collapse metaphysical certainties.

[11] N. Katherine Hayles and Donna Haraway's work on the *cyborg* are obvious antecedents to such a claim.

and enrich literary inter-textuality, expanding that conversation between tomes that constitutes heritage into digital media.

From this perspective, digital-media becomes a *wrapper* that duplicates and enhances the structure of language itself. If language is understood linguistically as hierarchical recursive relations of bounded sets of symbols that form unbounded sets of words, phrases and meanings etc...,[12] then a conceptual parallel with mediated data-structures is clear. Recursive hierarchies are inherent to the structure of digital media. Herbert Simon, one of the founding fathers of systems theory and artificial intelligence, identified hierarchical recursion as a fundamental feature of computational systems in his seminal 1962 paper "The Architecture of Complexity"[13]. Here, Simon sets up the foundation for his thesis by claiming that "It may not be entirely vain, however, to search for common properties among diverse kinds of complex systems" (467). This *search for common properties* is exactly what my own thesis is proposing is fundamental to poetic enquiry. Simon's broad sense of hierarchy which refers "to all complex systems analyzable into successive sets of subsystems" (468) has ramifications for systems (from mathematics to physiology) at an abstract level and corresponds with my own view that structural consistency pervades. The prevalence of hierarchical recursion in living structures (L-systems, fractals etc...), linguistics and digital systems points to a deep continuity between life, language and computation.

Bruce Sterling calls evolving mediated networks-of-things that inter-communicate:

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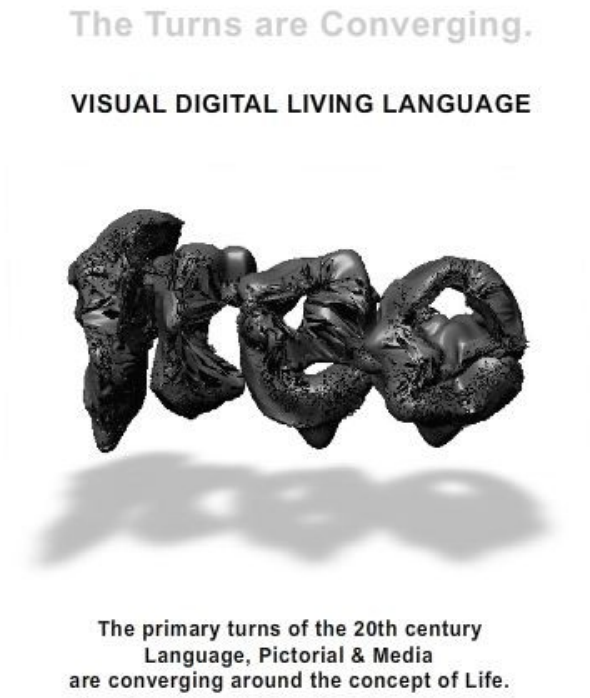
[12]This gloss of linguistic complexity is my understanding of the conventional Chomsky-derived position.

[13]Simon, Herbert A. 1962. "The Architecture of Complexity." Proceedings of the American Philosophical Society 106:467-482. Simon's paper also offers compelling insight into evolutionary systems theory that have implications for (poetic) creativity. He polemically states: "...human problem solving, from the most blundering to the most insightful, involves nothing more than varying mixtures of trial and error and selectivity." And drawing on an analogy of 2 watchmakers, one who uses module-based creation and the other who doesn't, he claims: "complex systems will evolve from simple systems much more rapidly if there are stable intermediate forms than if there are not" (473). Based on my own experience as a creator, Simon's claims make sense: most of creativity is path-finding trial and error which proceeds quicker if there interim steps.

spimes[14]. There are symptoms that *spimes* will emerge rapidly as ubiquitous computation incorporates itself into many objects around us. Language will not be exempt. As Kevin Kelly has presciently noted with every keystroke, the web is a strange creature that grows, nourished by collective contributions[15].

[14] Sterling, B. (2005). Shaping Things (1st ed.). The MIT Press.

[15]"We are the Web". *Wired*. Issue 13.08. Aug, 2005. (http://www.wired.com/wired/archive/13.08/tech.html). If Kelly is correct, then language is accumulating structures *necessary* for a self-aware model of reality to emerge. Whether these conditions will prove *sufficient* to a phase-change in the ontology of language is pure speculation. On another note: the way meta-data information accumulates online is analogous to how linguists understand phrases are inserted recursively into sentences; a corollary in poetics is the proliferation of ambiguity that emerges from the collision of meanings.



As organisms live, they collect memories within limits defined by their cognitive apparatus. In terms of quantitative stability of memory, digital media (in some respects) outperforms organisms. Some organisms know where they were born and who their mother is, many do not. In contrast, many recent digital photos contain meta-data that reports where+when they were born (precisely to the millisecond with GPS location), on what device they were born (the camera model and serial #) and under what conditions (ISO, f-stop, exposure). Similarly, emails are tagged with precise info concerning origin address, IP and time-stamped. As the cost of computational complexity plummets, it

seems plausible to expect meta-data motes clinging not just to objects in reality (through the arphids described by Sterling) but also to abstract entities like the component parts of language. It is not unimaginable or technically intractable to imagine a networked word-processor that performs real-time comparative analysis and feedback on phrase originality and the evolution of etymological variants[16].

As evolution asymptotically lurches toward a hypothetical singularity point, mediated language will have bridged an ontological gap between abstract system and entity. The 'contradictory elements' of word and world (see Mishima citation at beginning of this section) will have moved a little closer together. It is my contention that digital poetry offers cogent insight into this potential development. Why? because poetry is the progenitor of structured language (millennium before genetics and computers, poetry was concerned with self-reflexivity and formal properties of language); in multimedia environments digital-poetry is often hybrid (composed of both images and words) so it bridges the languages of code and 3D rendering; and poetry has been concerned with how language can offer compelling portrait-representations of reality, so it is actually an art of re-creating life or the art of living in such a way that language becomes an expressive instrument of intent. From this perspective, poetry is the art of *living language*.

1.3.1 What I Propose

Technological changes in the way digital poets are producing and handling language provide a valuable diagnostic (tool?) for examining subtle modulations of collective belief systems, specifically attitudes toward life and technology. I am going to draw attention to neglected correlations, esoteric tangential speculations connecting the external forms of letters and the internal physiology of the resonating chambers of the

[16] Turbo-charged spell-checkers of the future may convert some forms of writing from conventional creativity into games where players compete to convey *sense-points* or *meaning-scores* while at the same time increasing their *uniqueness* and *plausibility.*

human body, and how 3D modelling makes it possible to represent the affective dimension of speech: the oral kinetic kinaesthetic timbre, the roll and rasp of organs, the flexing dynamic content of moods, and the cadence of voice.

Essentially, I propose that volumetric affect in dimensional digital 3D animated letterforms offers a novel toolset for conveying the subtleties of the spoken word; digital modelling and animation of letterforms offer an opportunity to perceive modulations in poetic voice as sculptures.

The printed page has never represented voice very well. My feeling is that digital poetry will (in the near future) change all that radically. Following in the footsteps of advertising, 3D verses will splorch[17], explode and incandesce synchronous with features extracted from audio signals. The internal resonators of the body that make audible speech contain synaesthetic forms (topological archetypes) that will become part of the sculptural and behavioural toolsets of future poets. In the same way that contemporary writers assign font styles (**bold?** *Italic?*), future writers will assign weights, elasticity, textures and behaviours to letterforms. Language, due to its privileged status in human communication, when conjoined with audio-visual and quasi-intelligent dynamics in digital media will become widely perceived as entity[18]: something to be tamed or played with rather than a functional and abstract system of communicative symbols.

In this thesis I explore the pioneers who have already established the baseline pathways for creative use of language within software. To some degree, I focus on **visual** digital poetry and explore how technology is changing the way poetry is created and read. Yet

[17] The mucous of the mouth erupts into sonic frequency.

[18] Think about a paragraph married to a convincing 3d cartoon. This perception has the potential to modulate thought. The contention that technology transforms thought is far from original; for as far back as Plato's *Phaedrus* (cited in many commentators) technology has been seen as having effects on human minds. Plato predicted written language would eradicate memory. Marshall McLuhan saw the essence of technology's impact being in its medium not in its content; Harold Innis documented changes in empires based on their use of written media; more recently, N Katherine Hayles has chronicled the influence of technology on our collective conceptions of the human and posthuman.

my core concerns are with the introjections and fusion of art modalities (sculpture, music, painting) within and upon letterforms. Further, in some way, as coding fuses with writing, word choice becomes algorithm. And this increasing codification of writing practice leads inexorably to an inversion of categories, the elevation of computer from tool to partner and an inversion of static symbol into animate glyph..

One of the implications of seeing all things as living is also to faintly perceive all human activity as programmatically determined (or more accurately, conscribed) within the obscure reflexes of inherited cognition: recursive hierarchical structures of flesh are also machines.

As perception of living changes so does the world[19].

1.3.2 Machinic Language is Living Language

> "All things have the sensation of their own being and of their conservation. They exist, are conserved, operate, and act because they know."
>
> Tomaso Campanella. 1638 (in Skrbina. Pg. 79)

Throughout the thesis I take the (somewhat radical) position of using machinic and organic as synonyms. Noah Wardrip-Fruin says "A computer is a strange type of machine"[20]. I would paraphrase this as *a human is a stranger type of machine.* Humans are matter; they do not exceed logic; they cannot defy physics; yet even as they are machines, they deny it[21]. I couple cognitivist sympathy with the (equally contentious)

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[19]Though much is changing fast, we are probably a ways away from the very obscure condition of logocracy: rulership by words.

[20] http://mitpress.mit.edu/books/chapters/0262013436chap1.pdf

[21]Margaret Boden's *Mind as Machine* concisely expresses in its title the gestalt of this conception that is at the root of cognitive science. While I do not subscribe to all the tenets of cognitivist theory (which themselves are tangled and contradictory) I feel that the fundamental shift of recognizing the human species as machine puts us again into contact with the continuum of nature and the universe from which we arise; it is the 20th century's Copernican jolt.

idea that matter is also proto-conscious. This conceptual foundation is what I refer to as *mechanistic animism* or *mechanistic panpsychism.* It is anticipated by the 17th century Renaissance philosopher Tommaso Campanella (see opening quotation) who saw awareness as distributed and immanent, in ways evocative of contemporary theories of autopoieisis and operational closure[22].

Panpsychism is the academic term for seeing everything as alive. The term comes from all-souled: psyche, anime, anima, animation. In brief, it states that all matter (even molecules as they cling to each other) know something of what we call love, society and culture. I personally don't believe in a soul: souls are wherever we see them. But that is precisely the point with *tavits* their ability to emulate organisms will lead to attributions of aliveness. And attributions of aliveness, in the absence of definitive definitions, often constitute aliveness[23].

Katherine Hayles writes: "I think it is legitimate then to talk about the cell as a cognizer (or perhaps a sub-cognizer), a view that Daniel Dennett espouse in *Kinds of Minds*" (in Ricardo ed. Pg. 49). It is in that spirit that I propose the hypothesis of *living language*. I accept the possibility that the materialist worldview of things as inanimate represents an interim viewpoint. I redraw the *anima mundi* to include apparently inanimate matter (such as integrated circuits) and abstract systems (such as language).

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[22]Campanella divided power into three forms: power to be, to act, and to be acted upon. These echo the Mahayana triad notions of desire, indifference, aversion. At the core of each schema, the being of an entity, its capacity *to be*, is what contemporary theorists such as Maturana and Varela refer to as autopoiesis. For contemporary parallels, see *Mind in Life,* Evan Thompson or Daniel Dennett *Kinds of Minds*

[23] Attributions perform contingent ontologies; performativity in this sense is related to Austin's sense of the word as an action, and Judith Butler's use of the term as culture vector that redefines what it speaks of. In the same way the attribution of citizenship confers on an organism a variety of privileges and powers, aliveness is a categorical distinction that in spite of much biotechnical research remains a subject of dispute. Seeing something as living, often involves projecting onto it those characteristics we associate with life.

1.3.3 Between Boole and Disney

> "For mechanized writing to be optimized, one can no longer dream of writing as the expression of individuals or the traces of bodies. The very forms, difference, and frequencies of its letters have to be reduced to formulas."
>
> Friedrich A. Kittler (in Hayles 2009. Pg. 90)[24]

In spite of much of literature's refusal to recognize a link between formulas and creativity[25], there exists a conceptual convergence at the systems level between language, animation, and computation. As Kittler points out (in the quotation above) this convergence has implications for how humanity conceives of literary creation.

Animation and computational state-machines share terminology enough to suggest that they are structural analogues of each other. The Wikipedia definition for a finite-state machine (FSM)[26] states it "is a behaviour model composed of a finite number of **states, transitions** between those states, and **actions**" [My emphasis][27]. Finite state machines are pragmatic abstractions; the logic they embody underlies many common objects. Deterministic finite state automaton (DFA) "are widely used in text editors for pattern matching, in compilers for lexical analysis, in web browsers for html parsing, and in operating systems for graphical user interfaces. They also serve as the control unit in many physical systems including: vending machines, elevators, automatic traffic signals, and computer microprocessors. ...[and] play a key role in natural language processing

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[24] My own copy of Kittler's *Literature Media* has a different introduction than the copy cited by Hayles above.

[25] For a creative use of formulas in literary production see: Charles Hartmann's *Virtual Muse*.

[26] http://en.wikipedia.org/wiki/Finite-state_machine

[27] The bold terms in the definition of a FSM are shared with animation (and by animation, I mean cartoons, 3D etc…). FSM are widely taught in undergrad comp-sci discrete math courses. The metaphoric template is usually the Turing machine. A Turing machine is in some a classic metaphor: a cog-fed frame-buffer like the scoop on a mill wheel, except there is only one cup in the water at any one time, and the water itself is composed of logic actions. The result is streams of commands that link together to form programs.

and machine learning."[28]In short, they are at the core of how machines *think*. And key to this thesis, they are also understandable as animations: frame-based temporal media.

The terms **behaviour, model, transitions** and **actions** are not only used in animation but used with the same sense in animation[29]. So there exists a conceptual link here between computer science and fine art, between abstract mathematics and drawing, between data-structures and design, and therefore between George Boole and Walt Disney[30].

Figure 1 *Sooth* (2005) Text animation state machine.

What I hope to emphasize is that the disciplines of art and computer science which seem remarkably different, share core concerns. Animation techniques such as betweening, morphing, onion-skinning and interpolation (found in the Wikipedia definition of animation) have synonyms in the terminology of state-machine transitions. Tweening would involve gradients of data; morphing would involve converting data-types between two distinct machines; onion-skinning would be data-analytic overlap or temporal analysis; interpolation is the same as graphing the difference between values. Both FSM and animation are concerned with the calculus of complex architectures/skeletons which move.

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[28]"Finite State Automata," http://introcs.cs.princeton.edu/73fsa/.

[29]I am endebted to Alison Loader (an animator) for providing feedback on this argument and suggesting that "states - might be more recognizable to an animator as poses or keys …" and that the implicit hierarchies or rigs used in animation (legacy of our skeletal structure) are notions reflected in computational FSM hierarchies and recursion.

[30]I think an invite could be issued to Noam Chomsky to join Boole and Disney, since language, understood linguistically as chains of recursive clauses, bears structural similarities to FSM. Syntax, if we accept the analogy to animated skeletons rigged with hierarchical constraints, operates as a form of inverse kinematics. Grammar effectively constrains the joints of language. The claim could be made that language is an animated mutating FSA:an abstraction that takes physical form just as FSMs do.

This terminological congruence between finite-state machines and animations may seem to be irrelevant (to the main thesis of poetic animism in digital contexts) or a coincidence, but I believe it points to something more fundamental, it points to media as anima. The goal of a FSM is to interpret data and provide interfaces to it so that data seems familiar; in other words, the goal of an FSM is to put the data into a recognizable life-like format[31]. Similarly, animation seeks to emulate life. As language gets increasingly digitized into finite state formats, animation (understood as active change) will occur within its code. And this animation need not dance, it is sufficient that it is animated in the sense of listening and responsive to contact from users and networks. Auto-completion processes (as in auto form fillers and Google Scribe) are animations. They anticipate users with auto-complete suggestions and act to provide services. Auto-page turners that recognize where gaze is and turn to next block of text are animations. Mediation implies animation; and animation implies mediation. The surface (animation) and depths (FSM) of the digitalization of language are congruent. They reinforce the potential of an ontological change.

1.3.4 Methodological Notes

> "Nothing is riskier than predictions; when the future arrives, we can be sure only that it will be different than we anticipated."
>
> N Katherine Hayles, *The Future of Literature*. 2008. Pg.159

I am a practitioner of digital poetry, not a philosopher. The ontological argument that follows arises from insights gained in creative process. It should be accepted as an

[31] Interfaces that emulate familiar objects, that emit sound, move, respond and provide comprehensible feedback are the first surface of FSMs. The secondary surfaces are data structures with their own interfaces that allow database plumbers to grasp and manipulates *pipes* and *sockets*. It could be said that an ancillary player in this game of making-familiar is language itself which functions between layers with many relevant echoes to real stuff: icons existed long before computer screens, as did columns, rows, pipes and sockets. In this sense computer science is all animation: the art of making the machine-language bear just enough resonance to our former lived phenomenal field to be pliable by consciousness.

idiosyncratic contribution to diverse unresolved debates[32]. Since many of my insights arise from creative process, throughout the thesis I will examine creative works to reveal diverse ways (suggested by diverse intuitive abstract and sometimes personal research questions) of interpreting or close-reading a single digital poem at literal, metaphoric, technological and ontological depths. An analysis specific to digital literature based on scrutiny of creative works has many precedents: Richard Lanham, Jay David Bolter, Charles Hartman, (the ubiquitous) N. Katherine Hayles, Eduardo Kac, etc...

Most psychology or cognitive science experiments try to control for as many of these variables as possible. They strip away the superfluous and heighten specificity. In doing so, they constrain their conclusions to specialized niches[33]. In contrast, by approaching these questions holistically (as a generalist) and originating enquiry in artistic research-creation (not theory), I am utilizing a methodology that allows intuition a prominent role and permits variables to proliferate in order to examine the situation as a whole in its innate density. *Poets embrace chasms in order to explain the sun.*

I am interested in the general implications of questions with large ramifications; questions that are at once non-specific (ontological and societal) and personal (emotional). This paradoxical scope of scrutiny emerges from an acceptance of the personal as political, intimacy as insurrection. In the following auto-ethnographic document, I explain the impact and influence of software modalities on my own creative

[32] I think the role of poetry is to operate at the peripheries of logic, destabilizing notions, probing the entrails of insufficient evidence, and speculating about esoteric improbable futures. In this thesis I have taken pains to mitigate that radical tendency without neutering its nutritive capacity. So in essence this is a hybrid document that postulates a fertile interstice between academic formality and poetic excess.

[33] Consider a specific problem: How much do tools influence thought and in what way? The question is general enough that all certain answers are suspect. The number of variables inherent wherever people and computers interact are immense. Culture, age, education, experience, genetic predispositions, neurological differences, media familiarity, embodied cognitive conditions, etc…. My tendency is not to control for those variables by constraining the problem but to generalize even farther, to abstract toward an absolute: is thought a tool? Can a tool see itself?

practices. To set the context, I review analog dimensional typography and poetic movements, examine key digital practitioners operating in the hybrid zones between typographer-painter-programmer-poets, and then link authoring environment timelines and aesthetic animism, using a set of specific software case-studies from my own practice.

CHAPTER 2: MALLEABLE TYPE: A HISTORY

In order to understand what sound-shape archetypes might become as they manifest in volumetric and programmed poetics, and the historical roots of living language, this chapter undertakes an overview of visual type up to contemporary (digital and programmatic) malleable typography. Linking Cabbalists, Marcel Duchamp, Mary Ellen Solt, J.A. Miller, Peter Cho, Ben Fry, Jenny Holzer and many others into a lineage of poetic-typographic revolutionaries, this overview reasserts a positive interpretation of *opaque* typography and offers insights into the new interpretive axes required to critique typography (and literature) that is tactile, dimensional and responsive.

Immersion is often conflated with suspended judgement, but it is possible to also perceive immersion as enhanced consciousness, and reconnection with empathic continuity. This brief set of examples will hopefully confirm the value of immersive (i.e. non-critical, direct) apprehension as a reading strategy. I have chosen to concentrate on key artists rather than attempting comprehensiveness; these focused examples complement the creative examples distributed elsewhere throughout the thesis.

2.1 Visual Language

> *As a supplement to this section of the thesis, I created an online visual essay of typography and language art at http://glia.ca/conu/imageEssay/*

Visual language, in its broadest form as *language on a page that is read*, is a relatively recent phenomenon. Only in the last 500 years have the majority of humans accessed and read language with their eyes.

2.1.1 Pubs, Psychedelia and Illuminated Manuscripts

Before language was visual, it was oral[34]. Scholars, such as J. David Bolter and Walter Ong[35], have documented how language remained primarily oral even after it was written. Only with the invention of the printing press did language begin to be read silently[36]. Specifically, the printing press and the introduction of spaces between words changed the legibility of language; it was now feasible to understand it without reading it out loud; western culture shifted from oral communities with specialized scribes to a literate society that placed great emphasis on books as repositories of learning, and libraries as repositories of books.

Before the birth of libraries, primarily in the Middle Ages (from 5th-15th century), illuminated manuscripts decorated and conferred on text the status of visual object. Monastic scribes adopted sensual visceral and visual cues in order to convey power via The Book. Many of these complex (formal and structural) works are akin to the psychedelic mysticism spawned on 60s record covers and recursive fractals[37]. Illuminated manuscripts form the first occidental example of a highly sophisticated

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[34]Charles Bernstein, in the introduction to Johanna Drucker's *Figuring the Word*, refers to the Biblical injunctions of "In the beginning…and then there was light…:" as a heist by the eye from the ear and mouth. The thief was the printing press.

[35] Bolter, J. D. (2001). Writing Space: Computers, Hypertext, and the Remediationof Print (2nd ed.). Mahwah, N.J: Lawrence Erlbaum Associates. And Ong, W. J. (1982). Orality and Literacy: The Technologizing of the Word. London: Methuen.

[36]Few mention the earlier change from speaking thinking to silent thinking. The way words merge with mind tongue to make sound is as ancient as the larynx and it is only through training that we learn to think silently the majority of the time.

[37] Illuminated letters (as they were practised at Lindisfarne) suggest a cyclical cosmology in defiance of the teleology espoused by Christianity. The ornateness and sinuousity of these works owes more to embroidery, pottery decorations, OCD and nebulae than to the declared intention of glorifying God. Gold garnished curlicues adorning mammoth volumes bound in calf leather are luxury items, power totems not spiritual objects. As Stephanie Strickland notes: "tracings in sand, or waves and foam do not lend themselves to being power totems because of inherent ephemerality" (email correspondence with author, 18.09.11). Strickland and Lawson Jaramillo reinforce this notion, in the essay (http://www.slippingglimpse.org/pocode) surrounding their 2005 work *slippingglimpse.org ,* by relating it to chreods, necessary forms of topological flux.

integration of graphic *into* letterform; this is different than a graphic that is a letterform (as in hieroglyphs) or an ideogram (as in Chinese). Instead, both semantic and sculptural-visual meanings operate in the same figure, on the same level. It is the origin of image-text integration, the on-going assimilation of text by image (discussed in detail later in this thesis) which digital media accelerates.

Illuminated letters can be read as both sculpture and as texts. They impose this form of reading through opulent textures and surplus presence; when presence imposes itself on the eye, eye becomes visceral and absorptive. Interwoven recursive forms evoke ancient actualities: fire-smoke and cloud paths, intestinal entrails and molten lava. The letter is world made flesh; it becomes more than its semantic meaning, it is a composite hybrid perched between reading and witnessing. For this reason, illuminated manuscripts are the ancestors of 3D modelled typography, networked attention attenuation, motion graphics and visual language in poetry.

Figure 2 : David Smith: *A Sign Painter*

It might seem heretical to put illuminated manuscripts into the same typographic box as glass-sign-painting in pubs and psychedelic record covers, but the aesthetic lineage is

the same in each; and both reflect the urge to recursively decorate letterforms until they appear as entities or forces within foliage. Illuminated manuscripts are basically ads for an ideology (advanced inscription plumage in the ruthless hunt for souls); while pub-signs hunt buyers of stout. The significance of these practices is that they physically emulate forms of choreography, continue the bombast of the Baroque. The curlicue swirls that adorn these letterforms are the typographic-equivalent of the death flourishes of Sarah Bernhardt or the guitar licks of Jerry Garcia: torsional excess, magnetic vortices seeking to entice. It is easy to denigrate melodrama as trite from a distance, but everyone's tragedy is someone else's greeting card. What interests me about the ecstatic flourishes that are in typography from ancient times up until After Effects ribbons, is that there is something being expressed here that leverages archetypes: thirst, paths, labyrinths, forests, breast...

What is expressed in folding flowing illuminated scripts? I would guess that it is a complex knot of luxury (honey, melted gold), heraldry (status, shields), labyrinth (reading over and over until a message at the centre like a lure is taken or takes) and solidity (a sense of the letter as a thing that has weight, and by association its message is heavy and profound). What these features share is that they are all primarily attributes of matter. They reference the world directly in ways that do not require literacy; they are read by experienced embodied subjectivity. As humans, we have tasted honey, known or heard of gold, walked a labyrinth (or studied a curl of smoke), and held things in our hands. So the typography is speaking to the body at a lived level. It is engaging with the energy of our hands, muscles, and tongue.

2.1.2 Visual Language in Poetry

The history of visual poetry has been extensively documented. Dick Higgins, Florian Cramer, Richard Kostelanetz and Johanna Drucker (eminent among others) have each independently contributed to the now widely recognized lineage running from petroglyphs, illuminated manuscripts, picture poems, Dada, Lettrist, Fluxist, Concrete and book arts. The story often cites Sterne, Apollinaire, Mallarmé, Tristan Tzara, John

Cage, and Jackson MacLow. It is a field of variations and intensely diverse styles. In the sections on visual language that follow I oscillate between tracing out arguments and introducing practitioners.

2.2 Early History: Malleable/Sculptural Text

From Marcel Duchamp's 1926 *Anemic Cinema* to concrete poetry (as in Mary Ellen Solt's *Forsythia*), and sculptural typography there are many physical analogue precursors of malleable typography.

2.2.1 Pre-Historic Malleable Type:Clay

The vast history of known glyphs from prehistory contains no 3D letterforms as monumental as the contemporary CGI-carved 20th Century Fox's logo or Robert Indiana's aluminium sculpture *LOVE*. Instead pre-history is a plenitude of fragments and tiny monuments; handheld vases and tablets engraved, etched inward, and carved. Symbols pressed into moist wet clay, sketched on pottery, and carved into bone. Malleability and gesture conjoined at the source of semantics. Clay and mud were the substrate for the first malleable typography: erasable, tactile and supple glyphs. Pre-historic fragments of language etched into clay are at the origins of a lineage of the tablet pc or handheld PDA: both have a size and weight appropriate to the hand.

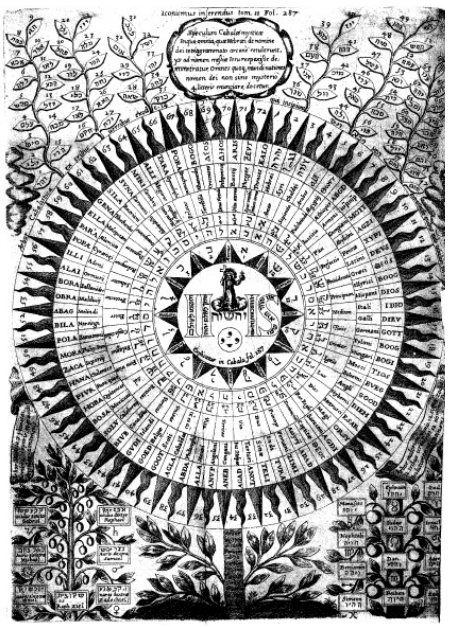

Figure 3: Athanasius Kircher's *Oedipus Aegyptiacus*

It is plausible to suggest that the soft pressure of a stick or finger probably lies at the origin of language. And at the origin, several disciplines are fused: the impulse to make marks and leave trace is an aspect of sculpture (scratching the surface), painting (marking the wall) and writing

(which might have developed as an outgrowth of counting, transactional memory). It is only as systematized symbols torque indecipherability toward shared sentience that language is born and becomes separate from the abstract or representational disciplines of sculpture and painting.

Language then grew separate from vision and touch for millennia until the printing press made the masses literate. Now digital media is once again making typography malleable and tactile. As is explored later in this thesis, language has come full circle to its roots in mud. Fingertips that touch the screen are touching ancestral processes.

2.2.2 Cabbalists & Alchemists

Florian Cramer has documented how ancient Kabbalists used generative systems of symbols to construct taxonomies of divine language. These systems often took the form of wheels of categories. While Cramer is concerned with the programmatic permutational implications of these constructions (and how process permutation informs computational poetry)[38], I am fascinated by the visual implications of these typographic wheels for digital poetry. I imagine some of these wheel-like charts converted into spinning discs for oracular divination. As the wheel spun, eager alchemist-mystics might have leaned over blurred letters, anticipating the next revelatory package of divine data. Speculatively, renegade mystics resembled internet users awaiting emails (bent over the spinning hard disc; reading results that surface through layers of abstraction); eyes often await the aesthetic impact that emerges when mobile text finally stops.

[38]For a prescient contemporary example of digital poetry that flirts with combinatorial alchemy, see Talan Memmot's *The Hugo Ball* (Published in Drunken Boat. Issue #8). *The Hugo Ball* is a combinatorial divination engine that spouts nonsense in a style similar to Kurt Schwitters' merz language.

2.2.3 Duchamp's Anemic Cinema

The spinning wheel[39] is a fundamental trope of Marcel Duchamp's 1926 film*Anemic Cinema,* an early example of animated text on film. In *Anemic Cinema*[40]phrases painted in spirals onto a flat disk are rotated at constant speed and filmed. The result is a film that expects the reader to read inward from the edge to the phrase's end near the spinning centre. *Anemic Cinema* seems to reference the algorithmic alchemists with their circular charts and spiralling meanings as it simultaneously anticipates the mobility and motility of digitally animated text pulled along curved paths. In Duchamp's film spirals of text painted onto wheels are spun in ways that only permit a reading if the eye slips in or out along a serpentine labyrinth. Vinyl LP grooves existent in gramaphone recordings may have been the inspiration. Certainly the vortices of Hitchcock emulators and Brion Gysin's *Dream Machine* are descendants. Reader flexibility is necessary: the poetic line is not flat, it is curved. Semantic impact emerges over time.

Anemic Cinema derives its visual energy from mechanical rotation. This evokes the origin of malleable language: the clay potter's wheel spinning so that fingers dragged from the centre to the edge form patterns evocative of nebulae or galaxies. In *Anemic Cinema*, geometric nebulae pattern segments function as visual punctuation between each of the text segments. The text segments revel in puns, spoonerisms and aphorisms; they semantically spin nebulas of potential meaning. The geometric interludes form a visual counterpoint or rest to allow the text's spiralling meanings to be digested. Several of the geometric segments succeed in conveying a three dimensional quality that anticipates the slab extrusions of CGI cylinders.

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[39]The spinning wheel is a motif that travels through technology in ways that connect to the activity of *reading*: from potter's wheel, alchemists' charts, phonographs, vinyl LPs, disk drives, cd-roms and dvds. Reading migrates from finger to ear to eye to laser.

[40]The title *Anemic Cinema* foreshadows a central credibility dilemma for visual animated poems. Seemingly lacking in the enriched healthy visual stimulus of imagery, visual poems are the anemic stunted cousins of *real* poems and *real* cinema. Duchamp's sardonic title diagnosed this credibility gap early.

The over-exposure strobes of the early film-stock date it to contemporary eyes as an antiquarian project; yet, this is a project that for its era must have required the use of technically advanced equipment combined with idiosyncratic vision. In this sense, it is close in practice to digital poets who extend software and work with new media: it leverages the edge of tech. *Anemic Cinema* places Duchamp[41] at the origin of animated text and visual poetry in high art and forms a useful link between ancient clay glyphs, potter's wheels and petroglyphs, and current motion graphics and spinning digital media: disk drive, laser disk, CD-ROM, DVD.

2.3 Opacity: an inversion of typographic transparency

Concrete poetry is the obvious 20th century precursor of visual digital poetry. Concrete poetry situated itself as a visual poetry: "a revolt against [the] transparency of the word" (Rosmarie Waldrop in Perloff. p. 114). But where concrete poetry was purely about *the word* (distancing itself from collage and hybrid practice), time-based malleable digital poetry (as I create and conceive it) is about image[42] (conjunctions, assimilations, permutations) and flow. Visual digital poetry involves *opaque typography* composited *into* images. In this context, *opaque typography* induces a semantic oscillation between the pictorial and the literal. This oscillation challenges the foundation of typography's transparency dogma and complicates stable interpretations. In the following segment I examine one key concrete poet – Mary Ellen Solt - as part of an argument for an expansion of visual poetry beyond the boundaries concrete poetry initially conceived for itself.

2.3.1 Mary Ellen Solt : sensual concrete

The term concrete poetry has often seemed (to me) an inappropriate misnomer for

[41]The work is signed by a pseudonym of Duchamp: Rrose Selavy

[42] And sound, … we return to that later.

some of the works classified under it. Concrete is a technological substance. It suggests synthetic hard surfaces: impermeable, roadworthy. The intention of concrete poetry's founders (Gomringer in Switzerland and simultaneously the Noigandres group in Brazil) was to differentiate and distance *concrete* from the soft emotional labial ambiguity of traditional poetry, an inadvertent side-effect is that a residual machismo clings to its exposition.

But there is a difference between the way concrete movement was conceived (as semantically pure attention to language's visual element) and the works produced, which are often sensual aesthetic organic lush and personal visions. An emotional relation to the work has ontological implications: it is a stepping stone, precedence on the path toward immersion with other, even if that other is nature (a totalizing enveloping system) or language (an abstract recursive vehicle).

Mary Ellen Solt exemplifies the contradictory impulses in concrete poetry, her work falls into (what I will call) *sensual concrete*. Her critical writing (*Concrete Poetry: A World View*) echoes the ideology of concrete's origins: "... there is a fundamental requirement which the various kinds of concrete poetry meet: concentration upon the physical material from which the poem or text is made. Emotions and ideas are not the physical materials of poetry. …the material of the concrete poem is language... [the concrete poem] places a control upon the flow of emotions" (Solt. 59).

While Solt's critical work (like many avant garde critics) insists on the controlled exclusion of emotion from content; her practice can be read as a contradiction of that stance. The history of literary movements oscillating between Nietzsche's poles of Apollo (reason) and Bacchus (passion) echo her complexity. Symbolists, surrealists, de Stijl, Joyce, Beckett, Beats, OULIPO, L=A=N=G=U=A=G=E poetry, Jodi, new baroque: the landscape of poetry fluctuates between diverse ideological camps, liquefying opinions No sustained resolution of ideological instability is anticipatable; narcisstic subjectivity

precludes cultural stability[43].

It is possible, however, to use Solt's own poetic works as evidence against a strict anti-emotional definition of concrete poetry. In her *Flowers in Concrete*[44] the expressive tendency of visual poetry erupts; these are delicate sinuous graceful works which open a free flow of aesthetic emotion. A figurative thread that echoes back to Apollinaire's style palpitates. Language follows paths that emulate nature; the textual fluidity is reminiscent of L-system pluri-potent cells in foetuses migrating. Metaphors display as visual analogies of themselves (Solt utilizes arboreal trees and flowers; Apollinaire utilizes an upside down heart tear). In *Flowers in Concrete* both the theme and treatment express an agile sensual softness that invokes oscillations between pictorial and literal. These are not words that deny emotion; these are works that exemplify it; they are more flower than concrete[45].

Flowers flatten on the page, lose three-dimensional malleability, but retain a trace of growth, and a capacity to evoke. Similarly, figures abstracted into language are not desiccated so much as transfigured: caught in an arrangement that becomes archetypal and iconic. Is it possible to have an emotional reaction or relation with an *investigation into the physical materiality of language*? Possibly, but logic probably takes precedence. Emotion needs sensuality; and concrete poetry in spite of its theoretical manifestoes became an exploratory space for sensuality. Thus *sensual concrete* acts as a precedent for *aesthetic animism* in digital poetry, anticipating tactile and volumetric type that

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[43] Ideological divides emerge on superimposed parallel cycles as each generation of artistic rationalists and emotionalists encounters and either rebels against or conforms to a previous movement. For my part, as a practitioner, I am seeking a balance where both emotion and reason co-exist, and formal and personal necessity converges. Even now, I recognize that I am biased toward expressive traditions and am only slowly beginning to appreciate the powerful traction offered by materiality theories of language-art.

[44] *Flowers in Concrete*. Mary Solt. 1969. Portfolio is available online in hi-res pdf at UbuWeb http://www.ubu.com/historical/solt/solt_flowers.html

[45] For a contemporary poet who extends Solt's sensuality into visual poetry see Derek Beaulieu's letraset works.

activates a sense of entity. Emotive animation is implied, text locked static flocks and folds along gazes. In spite of its structural stance, *sensual concrete* anticipates text as organism, laden with meta-data memories, palpitating off the page.

2.3.2 J. A. Miller's Dimensional Typography

The jam[46] joining concrete poetry to digital poetry is J. Abbot Miller's *Dimensional Typography: Case Studies on the Shape of Letters in Virtual Environments* (Princeton Architectural Press, 1997). Miller's work exists at the threshold between a predominantly computational culture and a typographic tradition based on print. As research it bridges the two cultures; in practice, it playfully and astutely probes the gap between page and screen: proposing experimental forms based on 3D rendering techniques, probing volumetric-language concepts and proposing taxonomy of volumetric letterforms.

J. A. Miller's taxonomy of typographic forms revolves around the simple block-capitalized categories of SPATIAL and TEMPORAL[47]. The SPATIAL includes extrusion (along non-traditional axes), rotation (around the font), sewing (as in cursive scripts and handwriting stitches), molecular construction (as in pixels), modular construction (as in geometric primitives) and bloating. These terms (native to 3D modelling) entering design discourse, migrate toward literary theory.

Miller's notion of TEMPORAL refers to Muriel Cooper's experiments (in the MIT *Visible Language Workshop*) where massive corpora of data became architecturally navigable structures. Miller does not speculate on the possibility of animating dimensional typography, it remains static, stranded due to GPU constraints.

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[46]The *jam* is a play on the initials of J. A. Miller but the metaphor of jam holds in that, jam is a squishy, sticky spread like malleable text in digital environments. Imagine a tasty text that touches the tongue.

[47]Miller capitalizes these categorical terms.

In the decade interval between Miller's work and this thesis, the thick protuberant or thin flexible fonts of dimensional typography have evolved into undulant sinuous morphs. Dimensionality has become malleable motion graphics. No longer stoically transfixed by the notion of the page as reading device, dimensional typographic is now fully filmic. The gestalt of typography has shifted from single-state into multiple, from single-frame into 720p. And it is along this multiplicity of identities that semantic meaning and interpretation occurs. It is in the fluctuations and vibratory transformations that readers become viewers. In time-based animation, the temporal becomes aesthetic as well as navigational. Literary interpretation must accommodate a modulation in the data-rate of language, the semantic throughput of visual-auditory and linguistic forms combined in time-based media.

All the formal qualities of dimensional typography labelled as SPATIAL by Miller have a corollary in contemporary digital malleable typography, a corollary augmented by tactile response; all the TEMPORAL aspects also have a corollary in digital timeline animation and interactive change. So Miller's primary theoretical role bridges media and contributes to a hybridized fusion of computer modelling with typographic design. For instance Miller explores the term *extrude*. Extrusion is a convention of 3D modelling; letterforms suction into space, logos protrude, poems are enacted around massive monumental letters. *Rotation* which conceals legibility can be applied like an automated canopy, so concealment becomes de-conceptualized and gestural. Cursive *handwriting* scripts flow into visibility in a multitude of examples: these have become a cliché of branding. *Molecular* fonts, where pixels flow and swarm along field lines, are particle system exercises: establishing the flow patterns where letterforms interstice math[48].

[48]In one sense Donald Knuth who wrote *Digital Typography* and developed the curve-point model for digital fonts can be considered a digital poet. He was among the first to experiment with converting letterforms into mathematical notations. As such he is a poet: a technical contributor to the structural substrate of every single poem displayed or written on a page. Knuth's skill and tenacity at carving out immaculate digital replicas of ancient typographic masters (down to nicks in bowl) is present in the words you are reading now. He loved type, he loved the tradition of its forms, he carried it over, he connected those worlds, his efforts partially brought you here.

Modular construction (popularized as Miller notes by Matthew Carter's font for Walker Art Centre) is typographic Tetris: innumerable logo-fonts in 3D environments composed from clumps of cubes.

2.4 Digital Malleable Precursors

> "Forme d'expression poétique
> qui entend traiter la langue comme matière
> et l'espace comme agent structurel du poème…"
> Pierre & Ilse Garnier. *Spatialism Manifesto*. 1962[49]

Pop art in the 1960s, profiting from the resurgence of concrete forms saw several major practitioners develop graphic styles at the intersection of language and painting. Let's catalogue briefly a few of the major contributors to that syncretic tendency. Pierre & Ilse Garnier in their manifesto for *Spatialism* (1962) mention a confluence of influences converging between man and machine in painting, sculpture and musique concrete. Max Bense, in one of his first polemics supporting concrete poetry (on a foundation of cybernetic semiotics) in 1965, begins: "The world is only to be justified as an aesthetic phenomena…"; Bense advocates a poetry based on linguistics, models and schema (Bense in Solt.73). Bense also argues presciently for a poem that is "verbal, vocal and visual… the three-dimensional language object"(Bense in Solt. 74). Dick Higgins wrote *Pattern Poetry: Guide to an Unknown Literature* in 1987, a thorough compendium of hybrid visual poetics through history. Joseph Koseth's primitive hand-written scripts conjoined with conceptual bravura to develop a space for poetry as plastic art probing the assumptions of the art market as well as repetition.

Yet as always there were setbacks and resistance to any definition of poetry which challenged the conventions of pure text on page. As Paul Dutton notes (in *Rampike*, vol.6, no.3), Gary Geddes removed all reference to Concrete Poetry from the 1985

[49] *Manifeste pour une poésie nouvelle, visuelle et phonique*. Retrieved from online http://crdp.ac-amiens.fr/garnier/article21.html on March 11th 2009. Translated: "A form of poetic expression which treats language as matter and space as structural agent of the poem."

edition of *20th Century Poetics* because he considered it "interesting but of limited significance". A 2012 search of www.poets.org (the Academy of American Poets website) for the keyword 'concrete' returned a single relevant reference: to Guillaume Apollinaire's *Calligrammes* published in 1918. In a dropdown menu Concrete Poetry is an option, but there are only two poets listed, ee cummings and John Hollander (b. 1929). This deficit of real pictorial poetry suggests a policy of strict exclusion (or cultured indifference)[50]. It may have multiple causes: the extra cognitive effort needed to read and watch, the tainted sense of visual poetry as a degenerate branch, visual poetry's programmatic and machinic implications, and visual language's eager adoption by advertisers (which biases viewers to see visual language as contaminated, lite, cosmetic and manipulative).

As the machinic gestalt arose in parallel with the age of appliances and concrete cities began swarming with tainted symbols, advertising distributed itself throughout public space and diffused into private space on TVs. Gloss photos, ricochet montage and succinct subliminal text supplanted and corrupted the poetic impulse, purposefully leveraging libidinal energy into machinic drives[51]. On the art market, the metals and machines of industry became the materials of language: Mathias Goeritz developed steel works such as *The Echo of Gold* (Solt 192). This commercialization of hybridity, inspired Alain Arias-Misson in his 1973 manifest for Poesia Visiva (an Italian movement that emerged after concrete) to declare: "The visual poem is a machine supplied by an inexhaustible current from factory to wallet … The *Visiva* poets reinvent a living speech for poetry, not by a reactionary swing from the obsessive mechanics of concrete to a literary poetry but with a virulent dialectic of visible word and semantic imagery."[52].

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[50] There are micro-trends to the contrary, as in Geof Huth's *Visual Poetry Today* overview article for Poetry Magazine http://www.poetryfoundation.org/poetrymagazine/article/182397

[51] See Alexander Galloway's review of Bernard Stiegler's *Taking Care of Youth and Generations* in *Radical* Philosophy 163 (Sept 2010)

[52] Chicago Review. http://humanities.uchicago.edu/orgs/review/60th/pdfs/40arias-misson.pdf

Kenneth Patchen's sustained polemics from the 1940s through 1970s created a parallel space for visual experimentation: quasi mystical anarchy ruled as sentences spanned multiple pages. Bp Nichol and Steve McCaffery claimed the typewriter as a tool for dirty concrete[53]; mail-art flourished. Kitasono Katue, in a "A Note on Plastic Poetry" (1966) was one of the first poets to recognize that representational technology offered an expanded toolset for poets, "The camera is fit to be used expressively by poets"[54]. For Katue, poems were *devices*. Poetry and image merged.

Basically, visual language's primary users are marginalized radicals (poets) and pop-culture manipulators (ad-makers). The centre of elite poetics shuns it. The following section examines practitioners persisting on the edges, subsisting in the interstices, resisting exclusion, converting the machinic and visual into the intimate flesh of poetry.

2.4.1.1 Eduardo Kac: *Holo and Bio Poetry*

In the 80s prescient observers prophesied holographic poetry competing in the mainstream of poetic evolution[55]. In 1986, Eduardo Kac claimed that *Holopoetry* provides: "an extreme, pluridimensional level of complexity. This new holistic perception, source of the fruition of real immaterial objects, volumes without mass, requires a response in the structure of language: the possibility to transform the instrument of intellectualization — the word — into a sign as fluid and elastic as thought… holopoetry launches a perceptual syntax, relativizing the cognitive process

[53] Thanks to Lori Emerson for re-introducing this term: http://loriemerson.net/tag/dirty-concrete/

[54] Katue, Kitasono "A Note on Plastic Poetry." (1966). Retrieved from http://www.thing.net/~grist/ld/japan/KIT-3.HTM March 2, 2009.

[55] Not many painter-poets work in holograms anymore. It is customary to place holograms in a dusty sci-fi dead-end (along with 8-tracks and laser disks), but as I write these words the breaking news online is that Japan has just embraced a new pop idol entirely made out of pixels: HatsuneMiku – Japanese 3D Hologram pop star. So if it's not a hoax, Gene Youngblood will be vindicated, holograms will in all homes. Poem holos will follow as certainly as odes followed epics.

according to the different points of observation in space" (Kac, 1986. 129)[56].

Kac's discourse revolves around dimensions; it follows the classic manifesto formula of establishing a necessity ("requires a response…") and then providing a cure ("…revitalizing the cognitive process…"); and if viewed from the perspective of his current preoccupations with bio-art and manipulated life-forms, holopoetry can be seen as the precipitating site where his ideas of volume (body) and code (poem) gestated. In his most recent works the activity of writing is biological, the poem is embodied, and the technology is nature; in holopoetry Kac attempted to write text as bodies of light.

Bodies in cities are read; we read each other using fragmented codes. Similarly, in the 80s Kac viewed his holopoems as discontinuous multiple perspective spaces where reading proceeds by ruptures. Words fracture into shards of light, signs "change or dissolve into thin air" (Kac. 1989). It is this multiplexed stability that is shared with bodies: temporal ephemeral units extruded from evolutionary imperatives, bodies die as do holopoems when the power goes out.

Kac encapsulates a continuity of lineage between bio-art and dimensional poetry. His work trajectory reinforces writing as creation. His sculpture occasionally reaches explicitly back into Genesis and creation myth, linking DNA to code and the corporal tablets of tribal edicts as in his 2001 work *Encryption Stones*, a laser-etched black granite diptych that translates the canonical passage from Genesis ("Let man have dominion…") into Morse code and codon sequences. These are cultural transcriptions that operate authoritatively at the membrane between archaeology, chemistry and information processing. These are poems that visually assert and literally subvert the force of authority by decomposing *the Book* into stone that is a mere cipher for a much richer living code. Dimensional poetry politicized by referencing distinct domains of expression, "critically reveal the intersemiotic operations that lie at the heart of our

[56] Also see Kac 1995: http://www.ekac.org/holopoetrybook.pdf

current understanding of life processes"[57].

2.4.2 Poet-Painter Hybrids

The major painters of our era are 3D artists. Commercial pressure and opportunity has led them to Disney, Pixar and ad boutiques. Film credits, websites and music videos pay the bills. This exodus along the cash gradient makes it difficult to find poets exclusively devoted to the craft of exploring software as an extension of painting.

2.4.2.1 Peter Ciccariello : A painter-poet

Peter Ciccariello develops dense baroque tangles of words and images. Letterforms so thick they are like oil painting done by a hurricane, modeled in 3D digital[58], texture mapped with chaotic camouflage onto visual fields where distance and intimacy exchange places. Letters in these computer-enhanced paintings seem to have been caught in the process of rolling over or emerging from mud. Their forms bear weight and cast shadows. Images merge with gestural clots of colour that confusing reading,

Figure 4: Peter Ciccariello. *Drowning Poem*. (2008)

[57] *Works from the Gen Series.* Eduardo Kac. 2001. http://www.ekac.org/genseries.html Retrieved Oct. 2010.

[58] Ciccariello uses Bryce, Maya and a complex chain of softwares to render his poems.

confounding any singular critique that does not accept the imminence of text as object.

Ciccariello's works emerges from abstract expressionist and collage traditions (and actively defies the sterilized flat uni-dimensional constructivist styles of concrete poetry). Committed to the principles of painterly explorations, these are non-participatory, figurative, colour-field steps on the path of dimensional type. Ciccariello is an outlier, whose adoption of 3D modeling, points to a social change in praxis for language artists.

Polygon spews of language wracking into amorphous clumps, Ciccariello 's work prefigures ecosystem anima, data-set network organisms whose flesh extrudes from static reservoirs into boiling agency. These are anticipatory static representations of future living language, washing up like seaweed in the depths of dark fibre.

2.4.3 Programmer Poets

The tactile plasticity of painting language is being incorporated into poetry by both those who use software (painters like Ciccariello) and those who create it (coders). Coding as cultural practice involves many levels at which textual representations emerge. No longer constrained by the limitations of software, code-practitioners are creating their own paths, coding custom interfaces and structures that evolve over time.

From a living language poetics perspective, these explorations constitute research into metabolic systems, explorations of structures capable of supporting quasi-autonomy, junctures where letterform and data-structure fuse.

2.4.3.1 Knuth Said

> "Like a poet has to write poetry, I wake up in the morning and I have to write a computer program."[59] Donald Knuth.

The parametric creation of font shapes for aesthetic purposes originated with Donald Knuth's *Punk* font produced using his software Metafont. Originally published in 1988, these fonts were inspired in 1985 when Knuth heard that "Typography tends to lag behind other kinds of stylistic changes by about ten years" (Knuth. 391). He immediately set about perturbing some control points by random amounts, "I had my first proof output 20 minutes later" (Knuth. 395)[60]. Thus the practice of programmatically creating digital typography for aesthetic purposes was born swiftly intuitively and without much fanfare. And with this Knuth earns his title as the first hacker of visual poetics.

2.4.3.2 Peter Cho : from TypoTypo to Takeluma

Contemporaneously with J. Abbot Miller's *Dimensional Typography*, Peter Cho (an award-winning designer who later received a fine arts master from UCLA and a masters of science from MIT) began to release typographic experiments that stretched conceptions of type as a carrier for meaning; the boundaries were stretched digitally with a zen-like precision using programming and rendering. His concerns place him at the membrane between an artist, a poet and a designer, but his consistent focus has been fonts, glyphs and the squirming squiggles of the semantic word. In 1998, Peter Cho developed *Forefont* type. "These letterforms stemmed from dissatisfaction with flat, texture-mapped type that disappears when rotated in a virtual three-dimensional environment. Forefont type pushes up against a grid and retains its "bumpy" profile

[59]Donald Knuth cited in Platoni, Kara. "Love at First Byte". Alumni News Stanford. 2006. Retrieved from http://www.stanfordalumni.org/news/magazine/2006/mayjun/features/knuth.html Dec. 2009.

[60]In contrast Knuth's project to complete the

when tilted towards the viewer."[61]

In the same year (1998) Cho developed a storm swarm 3D algorithmic text, *Nutexts*: "Nutexts is a series of experiments exploring three-dimensional space through typography. In each experiment, the text of a short or medium-length written work is laid out in a virtual three-dimensional environment according to a set of simple metrics or rules."[62] Spatially configured layouts correspond to virtual architecture, precursors of presence.

Cho's 2008 work *Wordscapes* continues the process of exploring dynamic force and participatory 3D typography. Interactive thoughtful and brief, one word for each letter of the alphabet is mapped to a set of mouse-sensitivities. The interactivity amplifies the semantics; it is animation in the classic sense. This is Warner Brothers' not Dostoyevsky; behaviours do not change over time, but each in its succinctness satisfies and nourishes expectation.

Cho's work that reaches the deepest (for me) is *Takeluma* a speech-sensitive installation completed in 2005. *Takeluma* reminds me of Kurt Schwitters if he had been exposed to shape-memory alloy. It is in essence a project that directly explores synaesthesia (between the sound of words and the forms we associate with them) and develops a speculative visual idiom. Cho's description: "Takeluma is an invented writing system for representing speech sounds and the visceral responses they can evoke. Takeluma explores the complex relationships between speech, meaning, and writing. While modern linguistics suggests

Figure 5: Peter Cho. *Takeluma*. (2005).

[61]Peter Cho. http://typotopo.com/projects.php?id=forefont Retrieved May 2009.

[62] Peter Cho. http://typotopo.com/projects.php?id=nutexts Retrieved May 2009.

that the relationship between signifier and signified has no discernible pattern, poets and marketing experts alike know that the sounds of words can evoke images which elicit an emotional impact. The project explores the ways that speech sounds can give rise to a kinesthetic response. The Takeluma project comprises several animated and print works and a reactive installation."[63]

By loosening language from the strait-jacket of definition, *Takeluma* explores a tentative hybrid between linguistics, abstract art and sound poetry; this occurs formally, intellectually and physically. Speech acoustics bind to letterforms. *Takeluma's* audio waveforms are ribbons, worms that extrude into space. These are precursors to letterforms that directly correspond to the body's internal resonant cavities, letterforms capable of expressing archetypal congruences between acoustic forms and felt semantics.

2.4.3.3 Ben Fry's *Tendril*

In the domain of dimensional typography with implications for digital poetry, there are some prescient pioneers. Ben Fry's (2000) alternative web browser called *Tendril* sets precedents aesthetically and technically. In Fry's words, "*Tendril* is a web browser that constructs

Figure 6: Ben Fry, Tendril (2000)

[63]Peter Cho. http://typotopo.com/projects.php?id=takeluma Retrieved May 2009.

typographic sculptures from the text content of web pages. The first page of a site is rendered as a column of text. Links in the text are colored, and when clicked, the text for the linked page grows from the location of the link." [64]

As Tendril's text dynamically grows it is woven into bulbous 3D threads that evolve over time into spinning bloated rhizomatic tubers. The surface of these structures is visually composed of text. These are now visual objects, hybrids or chimeras: data-mining refuse (conceptual probes into knowledge and reading), modulated geometric primitives (abstract visual art), and animated organisms (information visualization of biological memes). Tendril is a quasi organism and a hybrid cultural entity, it feeds on text, digesting it into rhizomatic skin. *Tendril* automates appropriation; it is like Flarf exponential: reconfiguring what it retrieves into a format that is readable as tumescent infinities.

Obviously, legibility is not the key pleasure involved in most typographic sculptures. These redolent forms, undulant in black space, swollen with language, are unreadable. The reading machine process programmed by Fry operates unseen behind the screen, engorging itself on text that stretch into curves that ripple as they excrete networks. This is sculptural animation that occurs in an on-screen ecosystem. And since it is no longer visible live it is also a fossilized excretion (the residue of Tendril is a few movies and jpgs and probably a snarl of code rendered inoperative by shifts in network protocols). So what the documentation provides is evidence (but not the actuality) of the passage of an incipient text-eating network-organism, a progenitor of creatures that will roam the net eating words and shitting pulsating rhizomes.

For me, *Tendril* is a canonical example of time-based language-driven digital art that simultaneously satisfies aesthetic and conceptual criteria. Naïve viewing derives satisfaction from the organic suppleness of its form unravelling from nothingness;

[64] Ben Fry: http://benfry.com/tendril/

informed viewers derive additional stimuli by contemplating the interaction of networks at an abstract level.

What's also interesting about Fry's *Tendril* is how amenable it is to both cinematic and computational critiques. The archetypal story of cinema is the chase scene (hunt or seduction); *Tendril*'s morphology can be read as extruded paths, tunnels of words through which we seek each other. Perhaps these are the vibrant paths of preening literary culture, the excess verbiage of reporters, the infinite roots of a forest of bloggers, the frying dendrites of epiphany prone poets. Or perhaps these tubes are spaces of latent intent, topologies where words seek each other.

Let's push the metaphor into embodiment: curvaceous and plush Tendril evokes language's guts, the throats of oral storytellers, and the fallopian tubes of Orphic oracles. In the trembling of its languaged surfaces, it is possible to read culture as a single tongue. At the same time as it seems to invite metaphoric transplants and poetic close-readings, *Tendril* denies this possibility; its river of words pass by in fragments of texture-mapped polygons rotating away from the eye like whales breaching in oil. Any oscillatory rivalry between legibility and pictorial subsides quickly into pure pectoral awe: watching *Tendril* flex its form takes precedence. Aesthetic instinct trumps contemplative text.

Thus *Tendril* stripped of its semantics remains capable of conveying thoughts viscerally, it speaks to the articulate muscles in us. It is the writhing hollow intestines of poetry itself articulating a challenge to both authorial intent and flat page, offering a generative leviathan inflated into kinematic writhing. *Tendril* is the ancestor of language that will feed off network content and reconfigure phrases into its own volumetric flesh.

2.4.3.4 Karsten Schmidt: programmer of dimensional typography

Post-Spectacular studio, directed by Karsten Schmidt, in 2009 developed dimensional typography experiments that operate at the boundary between animation, code and

Figure 7: Karsten Schmidt. Type & Form (2008)

sculpture. Many of their projects entailed a firm grasp of code and computational process.[65]

The Post-Spectacular *Type & Form* cover for Print magazine was grown generatively using a diffusion model. No typeface is involved. Pixels migrate into and populate rough letterform masks. 2D slices were combined to form a 3D volume using techniques borrowed from MRI data scanning. The final result is output from a 3D printer. This is incunabula of the digital age. By synthesizing the formal elements of his work into a singular object with extraordinary technical skill, Schmidt establishes a benchmark for generative digital typographic excellence.

But is that all it is? Is it only typography? If so, then why consider it here in an essay devoted to digital poetry? As noted previously, Gomringer prophetically worried that concrete poetry might someday degrade into "…an empty entertainment for the typographer"[66] (Solt. 10). *Type & Form* might seem at first glance to be vulnerable to such a critique: lacking in direct references to either human experience or organic

[65] Regarding the necessity for technical proficiency on the part of digital artists, in an interview at OFF 2009, Karsten outlined a problem with resonance for digital poets: "…you have all those creatives who don't do any technical stuff, which I think is the totally wrong approach, because how can you do creative stuff in the field without the technical expertise or the craft skills?" Quotation from vimeo video posted on blog at http://postspectacular.com/

[66] Solt, Mary Ellen. 1969. *Concrete Poetry; a World View.* Bloomington: Indiana University Press.

nature, it can be interpreted as a superficial design exercise. Superfluous technology applied without concern for deeper resonance. Yet, I think an alternative interpretation is equally valid.

Type & Form operates at a physical level as the preliminary extrusion of a computational and poetic use of materials that forces us to question our relation to language as mediated entity. Granted it is a static fossil for now, but future descendants will be kinetic. Borrowing algorithms of fluid diffusion that mimic the flow of blood or estuaries to develop its form (mathematics as meaning generation), superimposing complex layers (ambiguity and/or the classic striated onion of literary studies), extruding data into brittle stone (inverse Frankenstein), *Type & Form* contains within its developmental process all the crucial vectors of modernity. Linear flat paper poems become architectural nodes.

But, a critic might point out accurately, 'Karsten Schmidt does not even identify as a poet; he identifies as a programmer and designer. Perhaps as often happens in ideological tug of wars he is being used to make a point.' This is true: he does probably not even conceive of his work as a poem. Yet, in 1953, one of the founding members of the Noigandres movement, Décio Pignatari was a designer; he did not identify as a poet. *Type &Form* (perhaps inadvertently) echoes numerous concrete manifestoes which repeatedly stress that *form = content / content = form* (Solt). The links between this block of minimalist type and visual minimalist structural and semiotic poems are far from tenuous.

The cultural and technological contexts of its creation suggest other implications. 3D printers are the same price now that the Apple laser printer was in 1985[67]; they may soon be in every affluent home. Even poets will eventually own them.

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[67]Printer source data: http://blog.ponoko.com/2008/10/28/desktop-factories-in-every-classroom-business-and-home/ Extrapolation: 3D printing will permit the evolution of printing language that contains kinetic functionality and eventually proto-intentionality.

Type & Form may well be the preliminary fingernail of what will eventually become a body of work -- poems made out of matter, machinic-moulded poems carved on computers that will eventually contain actuators and metabolisms. *Type & Form* connects the clay-finger-stick origins of language to the tradition of concrete poetry. As a fossilized excretion it emanates *aesthetic animism.* The body of language squeezed through 3D printers is on the threshold of a revolution. Quietly and without much fanfare, a revolution has begun that will provoke visual poetry to migrate into palpable physical 3D. Publication notices of the future: *Download and print this poem, then put it on your shelf, it feeds off your network.*

2.4.4 Contemporary Practitioners: Motion Graphics & Mammalian Malleability

One dilemma for digital poetry is that the craft and technical process of skills involved in 3D typography exceed the capacity of many poets. The visual dexterity exhibited in the commercial domain (by gifted young auto-didact practitioners such as Theo Aartsma[68]) creates an aesthetic so difficult to duplicate and so intimately linked to branding mechanisms that the majority of poets (instilled with anti-commercial sentiments, Wittgenstein adages and residual concerns for *soul*) have herded themselves in the opposite direction: lo-tech, conceptual and

Figure 8: Theo Aartsma. *Free Style* (2009)

[68]Theo Aartsma portfolio: http://cargocollective.com/theoaartsma

austere.

The 'strictness' of Gomringer (Solt. 8) in his adherence to the principle of the concrete poem as just language has resulted in a landscape where digital and malleable typographic examples are to a great degree trademarked. Popular tradition and poetic tradition have diverged widely. The affect previously aspired to by romantic poets is denigrated as a preliminary step on the path toward a poetics centered on language. And it is for this reason that visual poetics, and specifically digital visual poetics, navigates a precarious path between style and substance. Advertising's voracious embrace of adversarial aesthetics (such as graffiti tags or steampunk as in the Aartsma example above) have essentially colonized various paths of poetic development.

The challenge is to reinvigorate and re-appropriate what has already been appropriated in ways that retain integrity. The other challenge is technical and will resolve in two ways: a new generation of geek-poets, and software that demands less learning time of its user. Both are arising.

2.4.4.1 Graffiti and Hacktivist Typography: Eyewriter

Even as it hurtles forward, much commercial and volumetric typography owes a lot to the past, to graffiti and tag styles which in turn are indebted to illuminated manuscripts, Elizabethan burlesque ads, archaic snuff/cigarette boxes and later Walt Disney. Letters that walk and roil with sinuous spines in thick shadowed acrobatic contortions exist somehow in between stasis and animation, legibility (legality) and illegibility (illegality). Oscillatory typographic creatures presence thick pop culture.

Figure 9: *Eyewriter Project*. 2009.

Graffiti nourishes contemporary dimensional text evolution. Because of the adversarial

culture in which it evolved, many graffiti artists (i.e. visual poets of dimensional gestural type) have come and gone without any recognition at all, writing their works on alley walls, freight cars, secluded doorways and under bridges. In those specific ecosystems, visual language has become a dense delirious hallucinatory rebellion. Statement of identity, sharpies pee point scroll work, industrial interior deco, toxic spray effluence of intricate creativity.

In 2009, members of Free Art and Technology (FAT), Open Frameworks, the Graffiti Research Lab, and The Ebeling Group communities teamed-up with a graffiti writer named TEMPTONE. Tempt is paralyzed due to ALS. The team developed a prosthetic *Eyewriter* to allow him to tag using movements of his eyes. Prosthetic remote projectors wrote in real-time his ocular gestures onto walls.

Eyewriter marks, as far as I know, one of the first remote signatures written with light onto a building using only eye gestures. With this language escapes the box of its traditional inscription limits and moves more proximal to the mind, even as gaze becomes capable of entering into a more intimate subtle relationship with letterform: interiority as interactivity.

2.4.4.2 Ads as Tech Ops : attack of the Filler poems[69]

It may seem obscene to move from altruistic activism to advertisements, and even more obscene to cite ads as poetry, but that is our next step. In a culture where rampant consumption threatens the material substrate of existence for the species, ads openly fuel addictive greed, amplifying the innate seek reflex. Yet, ethics and planetary considerations aside, ads continue to exemplify the cutting edge of what kinetic visual malleable text is becoming. Video bumpers and channel idents advance the technical edge of typographic motion-graphics. Merch placement logos for toddlers, tweeners and seniors evolve the state-of-the-art rapidly in a competitive system of software

[69] A play on Charles Bernstein, *Attack of the Difficult Poems* (2011) University of Chicago Press.

upgrades and corporate budgets.

If *aesthetic animism* (for language) emerges, then digital methods (metadata and animation) will need to be integral to letterforms; as such, ads are (unwitting) construction workers, building templates, exploring techniques, establishing ways that data, visuals, audio, interactivity and letterforms fuse to ensure semantic impact.

Ads, in addition to this technical function, share with poetry succinctness – the swift, rhythmic and judicious use of text. This constrained use of text (twittered slogan/logo aphorisms of temporally constrained-screen-dwellers cyber-haiku) corresponds to poetic constraint. Minimal means; maximal efficiency; a high information to noise ratio; small packets, dense msg, small minds, 30 secs, 15 secs, 5 secs, logo, cut.

In ads, language bounces, sweats, crumbles, swarms and collapses like an affection-deprived cockroach. Improbably, these are the technical grounds on which 21st century visual poetics will grow: from polemical sales-pitches to poem pets to poem spimes (*spoems :* poems that operate as quasi-aware objects).

2.4.4.3 A Hypothetical Letter-Object: Oggiano Holzer Zeitguised

Emergent properties arise when critical mass thresholds breach. In this next section, I consider three artists-practitioners from relatively separate domains as a cluster in order to suggest that language art might be approaching a threshold that is physical (as in Jenny Holzer's installations), quasi-organic (as in Lorenzo Oggiano's quasi-objects) and database generative (as in Zeitguised techniques). These vectors converge from high art, AI and motion graphics. This methodological clustering is to stress how the transformative potential of digital media operates at the interstice of disciplines.

Lorenzo Oggiano : *Quasi-Objects* (2003-) develops time-based sculptural *quasi-object* videos which derive their existential complexity from code. For Lorenzo Oggiano: "Life is

a real and autonomous process independent from any specific manifestation."[70] Oggiano makes morph objects generated entirely in cgi, responsive blob organisms that bloom to glitch soundtracks. Oggiano grows his video quasi-objects from state machines following laminar Perlin-speckled L-system entrails. Lichen or algae filled tidal pools with shallow depth-of-field and glitch audio synchronous with spatial change. These are Phong-gleaming abstract sculptures adrift in particle soup.

Imagine that in some hypothetical thread of the multiverse, quasi-objects fuse with real sculpted letterform objects. In that hypothetical future, **Jenny Holzer** will be recognized as a key figure in the evolution of dimensional poetic objects. Her Times-Square-style interventions sprout as LED curves from walls or wash over floors in waves. Her constrained immediately-identifiable aesthetic navigates a tension between propaganda and intimacy. By extruding language in retro tech (LED low-resolution displays) Holzer plays with advertising's narcissist chase after the next and newest, subverting its presence by postulating a world where words flow as ubiquitously and visibly as a (toxic?) rain.

Imagine Oggiano's quasi-objects made physical letterforms[71] from which Holzer made installations out of metamorphic alloys, and you have probably imagined a shot with similarities to a **Zeitguised** video. In a Zeitguised video 3D models harvested from public warehouses are sliced into existence, shredded as glitch shrugging into skins, to reveal "that the merging nano-, bio-, and information technologies have rendered the concept of human authenticity and originality obsolete, that artificial materials create their own

[70]Oggiano's words (retrieved from online at http://www.lorenzooggiano.net/ Nov. 2010) echo the view of a cognitive science school of thought called functionalism whose primary proponent Jerry Fodor espoused a form of *multiple realizability*: the notion that cognition could take root in any particular substrate whatsoever.

[71]Modelers now model physical things in computation, but if/as robotic sculpture grows, these models will be recycled to control the movements of physical objects. There is a strange recursion to the process.

artifacts and their future shape"[72].

In this hypothetical future, letterforms physicalize, enhanced with digital meta-data, their embodied entity-status preceded by many generations of living in close symbiotic contact with images.

2.5 Text/image Conjunctions: On The Path to Embodied Letterforms

> "Convergence … results in conditions proportionally able to undermine the expressive distinctness that separates art and literature."
> Francisco J. Ricardo (*Literary Art in Digital Performance.* pg. 1)

No process is immediate; few assimilations are total. However, in some digital environments, images are in the process of assimilating text[73]. As with social assimilations, this abstract assimilation is not without controversy. The normal popular view is that words and images are distinct and should remain that way. This view is easily found; a typical example is expressed in the Nov. 18th 2010 *London Review of Books* by Peter Campbell "… images tend to drown out words. Why not let them? Well, words and images need different kinds of attention. Words tend to reduce pictures to illustrations, pictures to reduce texts to captions" (LBR, 18/11/2010, p. 17).In this view, conjunctions lead to reductions, disruptions and ruptures in concentrative force.

Where purists see antagonistic competition, I see opportunities for synergy: combined word, sound and image creating greater throughput. Motion graphics in advertising demonstrate this potential clearly (as discussed in my Master's thesis and elsewhere in this thesis).Motion graphics are also (on youtube and vimeo posted as responses in on-

[72]Zeitguised is a motion graphics design group in Berlin directed by Henrik Mauler. http://zeitguised.wordpress.com/2004/05/24/the-zoo/

[73] This idea Is not new, it frames digital literature. Bertrand Gervias uses the term *subsumed* to express the same recognition: "…the texts that constitute it are initially perceived as images, animated metaphors or visual texts. The texts and documents become images, they no longer read [sic], they are to be seen: their linguistic dimension has been *subsumed* under their iconic function. " on http://aierti-iawis-2011.uqam.ca/esth-tiques-num-riques-digital-aesthetics Gervais has been using this term for years (conversation with author).

going) visual conversations. In motion graphics, images inhabit semantic spaces where words previously took precedence. Everyone with a TV is motion graphics literate; videos are read; they connect to each other within a recursive syntactical culture. Cameras are the new pen; video-editors are the scribes.

Instead of trying to battle the advocates of image-text segregation head-on, I will offer a history of image-text evolution[74]. It offers a proof by continuity that text is being assimilated into imagery, reading is fusing with viewing, and that synaesthesia may become as normal as literacy. If we assume evolution tends toward optimization, this suggests that image-texts are more potent (as visual-literature) than text or image alone. And it is not a sterilized monoculture of corporate creativity that will ensure all text corresponds to imagistic protocols. Instead it is as Manovich states, that the ensuing result of convergence or assimilation (or whatever terminology is used[75]) will be "—more species rather than less" (184) -- divergence.

It is not that text is eradicated as a simple 2D monochromatic entity, instead it is that print in static form becomes part of a larger continuum, an explosive gathering of text-image-audio *tavit* entities that arise at the confluence of hybrid media and increased computational power. And these *tavits*, instead of being at the periphery of culture, will be at the centre in ads, film credits, music videos, experimental videos and other pop culture.

Visual poetry in this evolving ecosystem is just one species among many that is being digitized. As Christopher Funkhouser wrote in 2007: "Poetry as it is known historically

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[74] As I chart the text/image that is at the core of digital poetry, I am indebted to W J T Mitchell's *Picture Theory*. Many of the ideas and modes of discursive approach that follow were provoked by his eloquent and vigorous discourse.

[75] Manovich would not agree with the terms convergence or assimilation: "In my view, it does not imply that the different media necessarily fuse together, or make up a new single hybrid, or result in "multimedia," "intermedia," "convergence," or a totalizing Gesamtskunstwerk. As I have argued, rather than collapsing into a single entity, different media (i.e., different techniques, data formats, data sources and working methods) start interacting producing a large number of hybrids, or new 'media species."' (pg. 189)

will never completely change into a digital form; it will continue to exist as it has – as myriad spoken, written, and other textual formulations alongside computerized counterparts" (251).

There are several ways image/texts occur **on the path toward the assimilation of text by image**. The first and simplest is a label or caption. On the cave wall, there is a scratched glyph near a smeared figure. Both picture and text inhabit distinct worlds. There is no visual overlap. Reading and viewing are activated separately. But already there is a symbiosis. As reading-viewing oscillate a meaning emerges that is the product of the two activities.

Figure 10: Text Overlay Example (created by author)

The corollary of the caption is text overlay (see Fig. 1). In overlay, text juts out a pier of translucent or opaque colour. Text appears above the ground of the page it paves over image. The text's world (the printed page) protrudes unapologetically into the world of the image. An oscillation between reading and viewing occurs; the text makes no concessions to imagistic style; each remains separate even though superimposed. In fact, the text's background ignores and occludes the image. Text in this scenario is antagonist to viewing of the image as a whole. It breaks the frame and obscures a segment. The overlay-with-background is implicitly hierarchical, privileging the language act. Explicative process trumps integrative absorption. At a very rough level of granularity, this layout reflects the widely held bias of logic over sensuality. As the text works to make the image comprehensible, it becomes the context.

The next step in the evolution of text-image toward symbiotic fusion is popularly

referred to as word-art[76]. When text as image discards the image entirely by becoming it, representative or mimetic functions are subsumed by the placement of words. Apollinaire is the obvious progenitor of this branch. His calligrames precipitate concrete poetry up into language sculpture. Steve McCaffery exemplified this tradition in Canada in the 1960s with an art-brut intellectual perspective. And idiosyncratic commercial-art practitioner Robert Bowen *TextScapes* uses a similar approach when he wraps landscapes in text. Camille Utterback's iconic *TextRain* is another example of "that tradition where the text is the image and vice versa, so that neither is fully itself autonomously, separately, individually" (Ricardo, pg. 76).

It is intriguing to note how Francisco Ricardo opens his treatment of *TextRain* by examining how the advocates of 'pure literature' exiled images from literary texts; the expulsion used a litany of doctrinal objections against the integration of imagistic content perceived as hostile to literature's essence (pg 54-56). Against such critiques, Ricardo explores how the effect of *TextRain* is "transmodal, a recursive amalgam of filmic, literary, performative and near-sculptural conditions"(60). It is within the ideologically hostile environment outlined by Ricardo that text and image establish illicit yet fertile contact. With digital imaging techniques, the porosity between text and image increases.

Eventually, after some time as with most couples, they move in together. In the previous case of text-as-image, text imagined itself as image; in the next case, text inhabits image and the idea of image-as-habitat emerges. Text sits on top of image, still occluding it perhaps, but it has left behind its clothing (the page). This is the first evolutionary contact between text/image; they now inhabit the same field. Each

[76]In most writing softwares, a little add-on package allows words to be bent or moved. This became widely available around 1990 when it was incorporated into MS Word 3.0. (Source: Wikipedia correlated word-art with ms word entry)

remains distinct; they are like shy strangers at a party standing in proximal intimacy but not speaking much to each other. Many ads use this formula. A photo with a logo superimposed.

In other cases, text begins to assume qualities of the image. The font will be chosen to reflect the scene; the predominant colour of the image may be inverted and assigned as font colour; the text position may be set to correspond with a sharp edge, a horizon or table. Essentially a process of assimilation occurs through concessions as features associated with things are implemented textually.

There is also the opposite motion, visual use of ascii text to reconstruct an image using grayscale values. Ascii portraiture's resonates with the thematic of mediated DNA civilization paradigmatic axioms : *We are all code. Languaged dna dancing*. An aesthetically appealing (and conceptually nuanced) example is Camille Utterback's *Written Forms*(200) which later got incorporated into *Talking Cure* (in collaboration with Noah Wardrip-Fruin). In these projects the otherness of the image/text, the way text distorts reality, emphasizes the foreignness of the subconscious and proposes an ergodic reading environment[77]. In ascii portraits, image and text have fused but in a power relationship much like détente; both are readable in constrained ways, in paralysis rather than synergy.

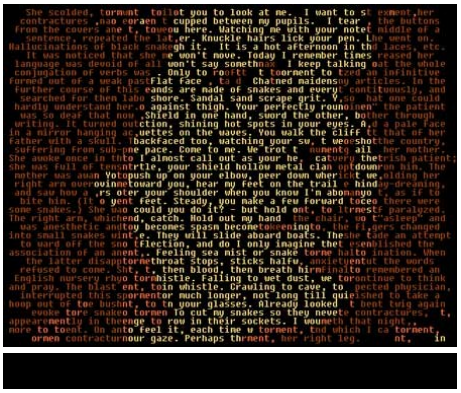

Figure 12: Utterback, Wardrip-Fruin et al.*Talking Cure*. (2002).

So what is assimilation? Does it occur when the oscillatory fluctuations between reading and viewing occur so swiftly that they are quantitatively imperceptible (merging into apparent concurrency)? Is there a cognitive mode that occurs when text/image is read

[77]Interesting tangential note is that Wardrip-Fruin anticipated contemplative reading being elicited, and in fact playful collaborative patterns emerged. (*Expressive Processing*. p. 365).

in parallel, when the impact of visual and verbal wash up on the shore of consciousness simultaneously? Metaphors are necessitated because there is no neurological lab or equipment capable of measuring the subtle flux and flow of meanings that arise and subside as the eyes wander, saccade, absorb focally and peripherally, both text and imagistic data.

Synergetic fusion occurs when the naturalistic aspect of the text (colour tones, light, shadows, textures, quality) matches that of the image. On the path to that equal potency, text needs a body and a substrate to rest on.

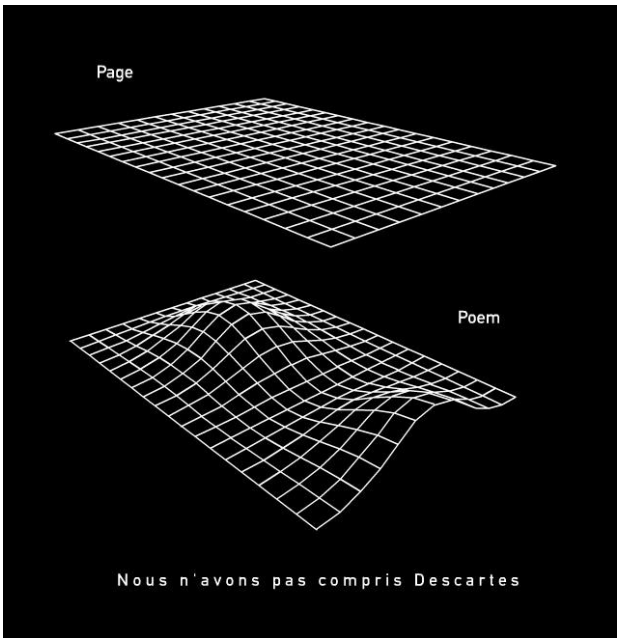

Figure 13 : André Vallias. *Nous n`avons pas compris* Descartes. (1990).

Both the body and substrate emerge in experiments in 3D poetic language conducted by pioneers such as Eduardo Kac and André Vallias. Kac`s *OCO* (1985/90. In Kac pg. 53) is a rough set of donut-style letterforms: O-C-O forming a cylinder. No textures, no phong or raytracing, not much by contemporary CGI standards, but a step toward the development of a dimensional body for letterform in literary milieu. Vallias' *Nous n`avons pas compris Descartes*(1990.In Kac. pg. 88) does something he perhaps had not intended, it translates Olson's field theory into 3D form, while *The Verse* (1991. In Kac p. 88) introduces poetic meter rendered in wireframe. *The Verse* looks like an information visualization of a poet's breath, a spoken word oscilloscope. So the body and territory (the tav and tavt) converge at the point where it is the body that produces the form on which the words rest, so even in their absence something is spoken.

2.5.1 Visual Language: Volumetric and Situated

"…visual form *does* something, rather than that it *is* something."
Johanna Drucker (*SpecLab.* Pg.75, emphasis in original).

Consider text on a flat page. If printed on a press, the text is indented almost imperceptibly. The ink has bonded with the paper, the fibres of the paper have soaked up the stain of the letter, paper and letter are materially bonded, melded together. On screens, there is no indentation of ink into paper. Pixels portray depth through a luminous two-dimensional perspectival grid. Nonetheless, due to the persistence of iconographic traditions of print, most digital text appears as if printed. To a casual eye, the similarities between the trace mark-making of petroglyphs, papyrus, hieroglyphs, and screen-based digital typography are strong. Line based, left to right reading, columns with headlines, formatting (upper case, sentences, underlines, italics and justification): these formal elements of writing persevere through technologies. Writing remains what it always was, a reservoir of prescriptive grammatical rules, typographic traditions, and literary effects. There are few attempts to *make strange*[78]with what is overly familiar.

Now imagine blisters arising in the form of letters on the printed page. The dormant immobile ink of each letter bubbles upward just slightly. The indentation of the printing press is inverted. The letters hover like pimples, swollen with ink, foaming over. They shine as if plastic; they gleam as if wet. The page is now implicitly tactile. It references Braille. It is now possible to conceive of someone touching the page and slowly (laboriously) reading it with their fingers. Unfortunately, if this imagined page occurs on a contemporary screen, then its depth is implicit, it cannot be touched. Tactility is offered then denied.

This absence of techno tactility (even in the multi-touch swipe-screen era) is a common

[78]Making strange is a feature of the *literary* according to early 20th century Russian formalists.

critique of digital media; yet, paradoxically, to its credit, the screen offers many illusions of tactility and three-dimensional space in a way that the printed page never did. The tactile nostalgia referenced by printophiles is (like much nostalgia) operating at the level of mythology: books by their weight and density convey a presence that is time. Books, by their texture, place what is read within a canon. As generations change, however, so too will the mythological status of tablets, cellphones and e-readers; devices will saturate in the memory of being held and read. That which has been treasured and held in the mind gains a tacit tactility; intimate, remembered words evoke identity.

To return to the imagined *blistering text,* imagine more, imagine that the letter-blisters grow pronounced as pimples, swollen with pulsating slushy ink; each letter now germinates and extrudes like a sprout; sexual, a thick fountain, a forest of letters, a field of wavering black stalks rises off the page; each is plush with a pulsing succulent interiority. Our viewpoint shifts, we rush over a thriving field of grown language, as if we were a bird or a low-flying plane, we rush over a field of wind-struck writhing letters raising their heads to the sun, following the reader.

It is all possible with CGI. It has already been done in a few commercials. Andreas Muller`s *For All Seasons* already replicates most (if not more) aspects of the preceding experience, and gives the reader-viewer interactive control. Text as field, immersive, tacitly tactile, already exists. Muller 4 years ago began working on a project to give computers the capacity to dream about flowers[79].

And as Rita Raley points out, Jeffrey Shaw's *The Legible City* (1989-91) and Matthew Kirschenbaum's *Lucid Mapping* project (1997-98) both predate the emergence of many other projects concerning 3D space writing. Rita Raley: "Concrete poetry brought the critical importance of the three-dimensional language object to the fore in its exploration of the positioning of words on a surface. … It is here that claims for a

[79] http://www.hahakid.net/forallseasons/forallseasons.html and http://www.vimeo.com/776076

phenomenologically new mode of reading are best actualized; pointing towards what may well be one of the future trajectories of reading itself. "[80]

To summarize, two fundamental steps occur when digital text is made malleable. The first step is it becomes volumetric (the planar surface of two dimensions enters into three. The field sprouts.) . Another step occurs when the text is placed, composited and rendered into a video environment. (The viewpoint shifts, letters become objects placed and lit within a field). The reader may experience this shift as the emergence of both space and a sense of the eye as camera, the view (becomes?) embodied. The first step induces a sense of text as palpable, it implies tactility. The second step invokes a sense of existence, text leaps beyond a gap, it enters into the hermeneutics of existence.

2.6 Second Life, the 2nd Life of VMRL

> "Functionally, it is both a text to be read and a space to be surveyed."
> Matthew G. Kirschenbaum., "Lucid Mapping and Codex Transformissions in the Z-Buffer," 1997, http://www2.iath.virginia.edu/mgk3k/lucid/.

What Kirschenbaum (in a 1999 paper to accompany his VRML work: *Lucid Mapping*) calls *fractal meaning* (265) is the same thing John Cayley refers to as *literal materiality*: the ability to use the scale of letterforms to alter the reading (in Raley, ed. 2006). In Kirschenbaum's example, inside a VRML environment, he places a complete paragraph in the bell of an 'a'. To read, the reader dives in, microscopically entering a region of scale where legibility becomes feasible. As Kirschenbaum points out this could continue ad infinitum: intimacy could become a scalar recursion, a literal form of pandora's box[81].

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[80] http://iowareview.uiowa.edu/TIRW/TIRW_Archive/september06/raley/editorsintro.html

[81] Cayley (in a 2006 paper on Lens[81]), similarly uses the surface of a letter that has been scaled up to fill the screen as the surface for another inscription. "literal materiality - the surfaces of letters composing the texts of 'lens' itself - can, in a simple illusory 3D space, subvert our familiar experiences and assumptions concerning surfaces of inscription. For example, by making a letter large enough within the programmatic structures of lens, the region of colour defining the letter-shape becomes an entirely different type of surface - it becomes a surface of inscription for other texts that had been perceived 'underlying' it.

It is impossible to consider poetry or typography in 3D environments without considering VRML. *Virtual Reality Modelling Language* has all but disappeared as an authoring technique and as a distribution vehicle, its effects replaced by a host of other motion graphic techniques[82]. Yet in the second half of the 1990s, VMRL was a powerful presence. Poets, such as Ladislao Pablo Györi, issued paeans to its glory: "Virtual poetry results from a basic need to impel a new kind of creation related to facts whose emergence -- for their morphological and/or structural characteristics -- would be improbable in the natural context" Györi also made general proclamations: "... all creative processes will move into the virtual space offered by the machine" (Györi.1995. in Kac ed. pg. 94).Funkhouser refers to Györi's sculptural *virtual poetry* as of the utmost significance. In terms of history, this is very true, but Györi's website is gone and his work has all but disappeared[83]. The internet is a swift tributary which eradicates its past as efficiently as fire in Alexandria's libraries.

Figure 14 : Ladislao Pablo Györi's 1995 Vpoem14

VMRL as a term was coined in 1994 and then arose on the web when virtual reality was ported over to the Mosaic browser. It was popular: by 1999, "… the population of Cybertown (hosted by Blaxxun, and based on VRML) surpassed 100,000 residents."[84] Now it is a ghost-town,

[82]One doesn't need to look far to see the legacy of VRML in logos and station adverts. One case in point among many, Nova Science broadcast logo (as can be seen at the end of a video on organ printing http://www.youtube.com/watch?v=lAI5rLnnCBE**)** bears a striking resemble to Ladislao Pablo Györi's 1995 *Vpoem14*

[83]As of 13/02/2011 12:08 PM Györi's*Vpoem14* can be viewed at http://www.cceba.org.ar/cvirtual/tpl/muestra-02/Vpoem14.htm

[84]http://vrmlworks.crispen.org/history.html . Accessed Feb. 2011.

the URL dead, the people moved on into Second Life[85].

Alan Sondheim is one of the few poets I know of to have done extensive work in Second Life. His approach is hallucinatory and excessive. It stretches the boundaries of what many might consider poetry. Trusting in the aesthetics of accumulation, Sondheim builds massive folly machines, churning wheels and polygon shard waterfalls. Independent parts rotate and careen, it is a bit like watching many superimposed looped explosions. In fact, there are no words so to speak, these are added afterwards in performative contexts where Sondheim recites and shrieks while dance collaborators gyrate in front of screens. The effect is similar to Survival Research Laboratory's aesthetic: twisted heaps of dementia colliding until catastrophe occurs, then occurs again. Sondheim's point (if he has one, which he does, he has many) is that we live in an era of entropy and excess. The careful antiseptic Bauhaus Ikea furniture of our homes conceals a careening that is occurring technologically. His staged interventions interrupt sane prognostications and cast viewers into a volatile perdition. Space distorts in ways that would have made Surrealists jealous. Cubism exponential. How is it poetry? Think of it as a collage of mannerist conceits, a place on the highway of culture where the conventional trucks of meaning have overturned and blind commuters continue to collide with an extruded semantic mass.

2.6.1 CAVE: spelunking the virtual

> "Playable text had earlier been achieved by interactive video installation – Tom White and David Small's *Stream of Consciousness* (1998) and Camille Utterback and Romy Achituv's*Text Rain* (1999) – but in the Cave environment, raining, or swarming, text becomes truly volumetric."
>
> Rita Raley, *Writing 3D*. Special Issue of Iowa Review. Sept. 2006

[85] There is an irony here in that both Director and VMRL were capable of full openGL 3D and ran in browsers with plug-ins. What has replaced them are Nintendo, Xbox, Playstations and Second Life. Nintendo, Xbox, Playstations all require dedicated hardware with GPUs designed to handle the torque of rotating polygons in realtime. None really permit participatory user-authoring of their environments (excluding the amusing machinimas such as Red vs Blue skits built in Xbox), except for Second Life, the lowest entry on the polygon count.

John Cayley's notion of *Writing on Complex Surfaces* wraps the page around the reader in an immersive space formed not only by computational practice but by cultural praxis. However, CAVEs are expensive; writing for CAVEs remains an elite activity[86]. Unfortunately, I haven't experienced a CAVE literary work, so I can't speak from immanent experience. On the other hand, cell-phones are cheap and rapidly becoming ubiquitous. And if the screen-size trend (identified as far as I know by Bill Buxton) toward wall screens (big) and handhelds (small) continues, it is reasonable to assume that some (that is to say: lots of) the volumetric tendencies explored by CAVE digital writing will become mobile, geo-locative and ultimately augmented.

There are numerous examples of geo-locative narratives done with audio (Janet Cardiff, Murmur, Teri Rueb, etc…and the artist BLUESCREEN did a piece where fictions could only be read at specific locations), but what I want to discuss here briefly is a foreseeable form of mobile literary immersion where the reader moves freely around finding phrases that can be both seen (superimposed as if extant) and heard; literature that can be played and plays out as if it were real: like *Blast Theory* but with augmented textual capacities.

Augmented reality expands assimilation of text by image. Imagine, for instance, I place GPS-triggered text over every road sign in my neighbourhood; mobile readers will see this new text, superimposed as if it were there. *Word Lens*, an augmented app for mobile devices, already background subtracts, compensates for light, adjusts for viewing angle (emulating perspective), and incorporates the text directly over the actual objects. As of this writing, Word Lens simply translates between Spanish and English; future versions and spin-offs will obviously become writing tools that enable authoring onto the city, writing onto the surface of reality. Imagine (faster processors, better cameras

[86]Most contemporary cave-writing activity occurs at Brown University. A faint precedent exists in the 1994 work *Virtual Bodies* by Diane Gromala created at the Banff Centre virtual reality CAVE. A large scale work that required four computer scientists and six art-techs over 2 years, *Virtual Bodies* was a theatrical work that incorporated technical-textual precedents of what would later become Gromala's *Biomorphic Text* (ISEA. 2000): a reactive font that evolves according to biometric input from viewers.

and) Word Lens functionality wed to Layar, an augmented reality app that allows authors to create gps-specific overlays of cities accessible through mobile devices. Imagine Layar made as easy as Wordpress. The implications are that the city will become a public space for writing. All surfaces will operate as inscription surfaces.

It echoes the vision of billboard-poet and QR-code visionary Giselle Beiguelman, who in Issue 1 of *Emerging Language Practices* (April 2010), re-expresses her pioneer approach to mobile literature: "Mobile Tagging is a phenomenon directly related to the popularization of mobile telephony and the popularization of QR-Codes. It is a kind of writing practice for the reading to be held in transit, based on a bimedimensional bar code – QR-Code (Quick Response Code). In other words, it is nomadic writing for expanded reading"[87].

Not only will this *expanded reading* alter the accessibility of reading, it will certainly accelerate subtle shifts in perception about text, destabilizing notions of where it is (page? screen? wall?), who wrote it, and how it can be shared. It seems safe to assume that it will become increasingly difficult in upcoming eras to differentiate between inscription traces that originate in matter and others that emerge from remote display processes. Writing will detach from the womb of matter even as it paradoxically becomes more location and viewer specific, glued to matter.

2.6.2 As Far Away from the Page as Possible

Brian Kim Stefans in a 2008 talk entitled *Language as Gameplay* identifies three holy grails for literature. His second grail is "Reading Beyond the 'Page': To write text for an environment that serves a textual function at nearly all times while maintaining the illusion of a dynamic, three-dimensional, processed space that is moving as far away

[87] http://epc.buffalo.edu/ezines/elp/issue-1/qartcode.php

from the 'page' as possible."[88] Augment volumetric and dimensional texts definitively aspire to Stefan's 2nd grail. When the evolutionary branches of the oral and written find fused expression in digital media, when the assimilatory power of 3D modeling and compositing tools hide and disguise text within audio-visual worlds, and when the prosthetic tendency of media prophesied by McLuhan ripens into a pervasive mindset, then perhaps literature will (in some cases) have moved *as far away from the page as possible.*

2.6.3 In Closure: From Watching to Reading to Watching

> "What we used to call 'watching' seems increasingly like what we once called 'reading'. ... We, the homini visuali, do not only read and write words but also images. The form in which things appear to us has thus become just as much text as text has become image."
>
> Max Bruinsma in *I Read Where I am: Exploring New Information Culture* (scheduled for publication late 2011)
> http://www.ireadwhereiam.com/

Letterforms inhabit paintings, collage, design studios, topologies, ads, quasi-objects, LED lights, conceptual artists, computer scientists and plundered databases. Their new potentialities arise from a crease in the density of creativity as powerful computing splashes into the hands of multitudes. Poets, programmers, and painters fusing skills constitute a powerful nexus inducing a pervasive shift in writing and reading.

What once was watching and reaping became reading and now is watching again.

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[88] Stefans generously posted this talk on January 11th 2011 to the group blog *NetPoetic* http://netpoetic.com/2011/01/language-as-gameplay-from-the-oulipo-to-the-jews-daughte/#more-1967 . The other two grails are Writing without the 'Author' and Writing/Reading as gameplay.

CHAPTER 3: **AESTHETIC ANIMISM**

> "A man of my occupation seldom claims a systematic mode of thinking; at worst, he claims to have a system – but even that, in his case, is borrowing from a milieu, from a social order, or from the pursuit of philosophy at a tender age. Nothing convinces an artist more of the arbitrariness of the means to which he resorts to attain a goal – however permanent it may be – than the creative process itself, the process of composition."
>
> Joseph Brodsky – Nobel Lecture. 1987

3.1 Aesthetic Animism: Introduction of Term

Aesthetic animism occurs when an animated emulation of life seems alive. In other words, it is a subjective attribution of life or livingness based on a perception of credible autonomous motion or systemic beauty[89]. This aesthetic-ontological act entails a cyclical reciprocity emergent between perceiver and perceived instead of a uni-plex subject-object reception/projection. In simpler words, consider how humans perceive the ecosystem (grass, flowers, trees) almost without any thought, moving through fields often immune to any contemplation of the field's livingness, because they know it is alive, accept it as such.

Humans engage with living things emotively and complexly; we expect reactivity and responsiveness in creatures but when the reactivity does not activate instincts we ignore it. Our knowledge of the world (our epistemology) arises from relational acts, experiences, physical systems, and the tactile presence of other organisms. Language is the abstract systemic filter of these epistemic experiences; it is also the means by which

[89]Note: I am not arguing for conventional notions of animism or the (somewhat) untenable attribution of human-style intentionality to inert substance. Instead I am arguing for a terminology specific to the aesthetic experience of visual text in digital media (media where text is tactile, responsive, three-dimensional and endowed with expressive motion).

experiences think within us. As life changes over time (through birth, growth, and death), so does understanding and the language used to express understanding. Digital media introduces a very dynamic change into language's structure and capacities.

What will happen when language is visual, auditory, and intelligently reactive? What does this future entail for literature? If language is perceived as alive will we even notice? Does not a fondness for a certain word or sound, the worship of a cadenced phrase, already constitute a form of relation with an entity? Will digital tech amplify that relation?

Thinking through these questions involves accepting aesthetic animist language as credible. I introduce four arguments for (or ways of thinking toward) aesthetic animism. In the case-study chapters I link each of these arguments to specific software.

Poetry roots its visual origins in inscription and a quest for meaning. It has often been an ontological act that disrupts norms and asserts the incredible; the following arguments belong to that category of discourse.

The four arguments for *aesthetic animism* are:

1. An argument from **Evolution**
    i. The separation between language and nature as methods for aesthetic experience (a separation that emerged with inscription and was mass-disseminated by the printing press) will be resolved when digital language adopts features of organic life and is perceived as natural and natured.
    ii. Related software case-study: Mudbox
2. An argument from **Prosthesis**
    i. Languaged media is technology, therefore (following McLuhan) it is an extension of our body. Our bodies are perceived as alive. Therefore the more mediated language becomes, the more it will seem alive. Eventually its abstract foundation may be forgotten or over-shadowed by the dominant perception of living text.
    ii. Related software case-study: Mr Softie
3. An argument from **Assimilation**

i. Language is slowly adopting features of a real object in a real world. The assimilation of language into audio/visual interactive environments occurs in stages. The assimilation of text by image requires a new terminology; I propose the term *tavit*: Text inhabiting interactive a/v environment.

ii. Related software case-study: After FX

4. An argument from **Networks**

i. Network (or graph) theory is often used as an explicative model for neurology, language, the internet, culture, and computer code[90]. Poetry can defined as the perturbation of congealed semantic networks through the use of ambiguity, ellipsis, tropes, rhythmic allusions, etc... This ubiquity of networks point to a fundamental structural continuity between systems that are considered living and those that are considered abstract or mechanical. Network paradigms suggest that language is already alive, digital media permits us to perceive it as alive.

3.1.1 Evolution Argument

For me (on my traditional days), a poem is an event that enchants through language; it eclipses reason, restores being into resonance with arriving. Let's assume that the aesthetic experience (activated by poems) precedes all language and all symbolic written records. Interim conclusion: the first object of aesthetic awareness was not language (as we know it) but phenomena. Entities felt beauty and felt meaning (Gendlin[91]) before writing about it[92].

Then, sometime long ago, came language: words were born, sprouting from sounds, small phrases formed colonies, sentences made walls with grammar, and linguistic structures became semiotic. Eventually poetry leapt from the mouth into symbols:

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[90]See Barabasi, Albert **Bursts**. (2010, Dutton) and Sporns, Olaf. **Networks of the Brain.** (2010. MIT Press.)

[91] Gendlin, E. T. (1962). *Experiencing and the Creation of Meaning; a Philosophical and Psychological Approach to the Subjective*. --. New York: Free Press of Glencoe.

[92]Derrideans might contest this point. But the question of 'what came first: inscription or spoken word?' is not the same as 'what came first: inscription or experience?'

petroglyphs, hieroglyphs, and scripts. Then poetry lay down on the page (China 11th c., then Gutenberg), inert and evocative, invocation encoded itself in letters, letters were printed.

After print, the tree of meaning (Bringhurst) sprouts a new major branch, a literary branch. In the old physical trunk, organic aesthetic experiences of nature remain audible-ocular-tactile sensorial and immersive. In the literary branch, written language (leveraging imagination and empathy to activate simulations of sensorial data) evokes aesthetic experiences. Evoked literary experiences may be rich and immersive inside the reader, yet the means of their production are symbols: letterforms which do not bear any resemblance to their semantic content. The word *wet* does not yet appear moist. The word *heavy* does not visually have weight[93].

In contrast, contemporary mediated language is already capable of displaying complex semantic levels visually in the appearance and behaviour of letterforms and words. Digital technology is mutating literature into many synaesthetic hybrid species. In the same way that literary critics might have spoken of style or genre before[94], the prevalent use of motion-graphic presets constitutes a transfer of stylistic parameters that are quasi-organic, as if the text is injected with DNA. In motion graphic environments, poems flock, stalk, reflect light, cast shadows, bounce, collide, react and vanish. Reading the attributes as a whole, the reader-viewer may experience digital poems (or the words within them) as entities inhabiting a *natural domain*[95].Does a word

[93]See Bateson *Ecology of Mind* in Cary Wolfe 'Language' (2010) as an example of this disconnect between sign and semtantics. I am aware that some typographic initiatives to heal this arbitrariness (Saussure) have occurred: slab fonts are an attempt to bring synaesthetic heaviness to words. But it seems safe to assume that the potency of digital means (3D, animation, interactivity) will eclipse print typography's efforts in this respect.

[94]Manovich also makes this point in *Software Takes Command.* Critical discourse is absorbing biological metaphors because computation creates entities that have behavioural characteristics and evolutionary histories.

[95]By nature, I mean a perceptible system that appears to contain depth, growth and logical consistency.

that moves as if alive express only its dictionary meaning? Specular depth, refraction indices, inverse kinematics and other terminology from 3D modelling may prove useful as digital semiotic indices. As may easing equations, matrices transforms and splices. Many critics have recognized this hybridity necessitated by digital literature.

Aesthetic animism is that moment in the *evolution* of language (its integration of attributions associated with living things) when an enactive feedback cycle occurs between literate viewer and re-naturalized technologically-enhanced word-object-organism. Digital language is once again perceived as innately natural. Re-natured letterforms entail an augmented semantics. Letterforms, imbued with organic qualities by digital media, become situated critters, leveraging evolutionary reflexes not literate responses. The aesthetic experience evoked (that is simultaneously reading, viewing, using and experiencing relationally) becomes a fulcrum where ontologies about life and attitudes toward language converge.

3.1.2 Prosthetic argument

Marshall McLuhan described all media as extensions of our bodies, technology as prosthetic. Katherine Hayles also notes that: “Anthropologist Edwin Hutchins and neuro-philosopher Andy Clark have pointed to the ways in which cognition is enhanced and extended beyond body boundaries by everyday artifacts, from pencils to computers, that interact with bodily capacities to create extended cognitive systems.” (in Ricardo. P. 39).If McLuhan et al. are correct and media is an extension of our bodies (or even perceived as such), then language (or more precisely letterforms which are increasingly mediated) will cease to be perceived as an abstract system for communication and become a palpable reactive prosthetic of our bodies. I am not talking of the cursory projective identification authors have with their words. Our bodies are alive, thus

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Composited over a virtuality perceived as reality, digital language palpitates, writhes, possesses dimensionality, and is responsive . This situation demands an expanded semiotics which is beyond the scope of my enquiry . Within the scope are the implications of the reception of enhanced mediated dimensional mobile audible language.

language will be seen as alive. This will occur due to the synergy of McLuhan's recognition that media is perceived as the body of its user (with language as media, thus it is an extension of ourselves) in conjunction with letterforms exhibiting behaviours and adopting representations that emulate bodies.

Unlike material objects which when rendered do not gain dimensional qualities that they did not previously possess, a dimensional animatable body is being created for letterforms that they previously never possessed. It is possible to point to a chair in a virtual space and say: "That is a chair". Chairs existed before virtual worlds. Johanna Drucker points to a similar distinction comparing letters to chairs: "The functional life of letters is obviously different from that of chairs, if only because letters' significance depends on their being recognized." (SpecLab. p. 150). She relates this distinction to Donald Knuth's struggle to program the essence of letterforms. The distinction I am trying to make has nothing to do with the functional life or essence or letters, but with their perceived ontology. In other words, their being or existence.

Prior to the digital expression (what could be termed the embodiment) of language, it was not possible to point to language and say: "That is language." Or perhaps more correctly language could not point to *itself* or contain data pertaining to *itself*. Prior to digital mediation, language as a self-reflexive physical entity[96] existed only in recursive conveyed meanings resonating in readers. There was speech, audible reverberation, synaptic tingles, jolts of lucid grace, newspapers, books and lead type, but language itself did not possess a physical body capable of retaining knowledge of its form and location in a network of other words. Language was printed and its ink seeped into paper, but it had no skin or skeleton of reverse kinematics capable of dynamic reactivity. It acted as an extension of our minds, imperceptibly like air; but it did not extend beyond itself.

[96]Only the occasional narcosis-induced vision as in William Burrough's aphorism "Language is a virus"

Digital technology's may change collective perceptions of language; so that letterforms are perceived more as autonomous tribes, clusters cohering in the service of an ideology, clouds capable of developing and delivering communication.

The more that language is entangled with kinetic intelligent embodied and responsive letterforms extruded onto screens, the more likely it is that we may forget, collectively, a time when language did not swerve to avoid us, try to serve us, and dance to capture attention. Its presence may still be largely (in daily life) transparent but its transparency will be as the earth underfoot, a massive living organism that supports and guides. Imagine a mountain getting up and walking toward a horizon. That is the situation now. A mountain is walking off. Living language is a non-trivial development in the history of communication.

3.1.3 Assimilation argument

Before language can be seen to be alive, it must at some level *belong* to the environment in which it is perceived. How does *belonging* occur? It occurs slowly in steps that recoil and meander. Like the symbiosis between mitochondria and cell, text and image have evolved cohabitation patterns over centuries. Digital media is accelerating the process of their interrelation. The ecosystem is culture; the fauna they inhabit is networked media. *Belonging* is a historical process of slow assimilation. It is not a unidirectional flow[97]. Human language is adopting the capacity to disguise itself as imagery; it is becoming capable of merging within images; it is being assimilated into a physically representative system.

[97]By this I mean that I do not see images becoming more like languages. Images are more heterogeneous: there is not a shared alphabet for forms or light. The syntax they express invites divergent open interpretations. Images show no signs of adopting a consensual interpretive system that is like language. On the other hand, as images are increasingly mediated, they are innately composed of language. And as WTJ Mitchell points out, in daily life, language is imagistic, and images encourage conversations. So distinctions are formal and not necessarily as complete in life. As the poet Susan Stewart observes about her own writing process: "We can't see it without hearing it" (http://forum-network.org/lecture/susan-stewart-poetry-and-perception 20: minutes in)

I am not using the sense of belonging that refers to lack of incongruity. Language that belongs to a scene can be incongruous and in revolt as long as it seems to live there. The word *mutation* can perch on my shoulder as long as it seems physically appropriate, obedient of basic laws like conservation of momentum, gravity, collision detection, receiving light, casting shadows, and occupying space. If the basic physical appearance of belonging is satisfied, then the automatic presupposition is that it has a life; it must experience its space. Perhaps as a plant experiences space, perhaps as a stone, but innately it is of its environment. This sense of text belonging to the language-scape is crucial.

Think of how we see worms. We know they are living. We don't expect conversations from them. But we know that they function beneath soil, they are tubular hermaphrodites, etc... And each of us has used the word to refer to computer code. What I am suggesting is that mediated words, the words we read in ads and in kinetic typography, increasingly share that sort of status. Their interactivity and code endows them with quasi-autonomy[98]. Sometimes small mediated augmentations to the data structures that make these words change them considerably. Example: in 2009 I built a very simple application that made words sensitive to sound; the equation is rudimentary: if the device hears a sound above a threshold occurring after a set time since the last loud sound, it changes. This sort of 'hearing' has been around for decades in dj/vj beat-matching application. Now it is proliferating. With handheld distributed devices that are capable of sensing locally (microphones and cameras) and sensing globally (satellite / cell coverage / wireless), the sophistication with which devices, images and words merge is shifting[99].

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[98] An autonomy that is (as we will see in the following section on networks) is challenged and co-existent with algorithms.

[99] In the first draft of this sentence, I used the word 'listening' instead of 'sensing'; I took it out because in academic contexts excessive anthropomorphism is suspect. But perhaps I was mistaken, there is evidence that probabilistic AI is evolving fast, as the conceptual digital poet Christophe Bruno notes (when he introduces the Google takeover of Blogger in 2003 to a discussion on Jeremy Bentham), the 'cloud' is

3.1.4 Network argument

> "… virtually all complex systems, regardless of whether they are composed of molecules, neurons, or people, can be meaningfully described as networks."
>
> Olaf Sporns, *Networks of the Brain.* pg.29

The question of life, or what is living, is a question of ontological status. In pre-scientific eras, answers arrived intuitively and subjectively through sacred texts which granted humans status as the creator's favoured children, free willed organisms. In the traditional scientific view, living things somehow have self-organizational properties; they have metabolisms (internal modular structures); and they are capable of autonomous homeostatic action[100]. Both these paradigms, (which insulate humanity from considering matter equal with itself) are less tenable in the light of multidisciplinary insights from graph theory. It is possible to reorient the question of life into a question of networks. Networks from a sociological poet's perspective are sets of relationships that transfer meaning along trust channels.

Increasingly from ethnology to primatology, animate beings are considered as rule-based creatures (and human industry applies these insights into flocking algorithms,

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listening to us, corporations panopticon the blogosphere "to scientifically predict the behaviour of users, what they are going to think in any given circumstance (not as individuals but as a statistical set), in order to optimize the adwords/adsense machinery, on which Google IPO is based" (http://www.christophebruno.com/2006/10/31/the-web-before-the-web/). When Christophe Bruno in his *Cosmolalia* project refers to the role of words in "the circulation of information, desire and advertising" (http://www.cosmolalia.com/readme100/index.php), it makes me wonder If (just if) words are bought and sold, and if (just if) they are pseudo-autonomous viral entities moving between us as hosts, then isn't it possible that words can be enslaved? In his 2003 project *adwords* Bruno took out google ads and wrote poems in them. His first ad-poem was triggered by the word 'symptom' and read: "Words aren't free anymore" (http://www.iterature.com/adwords/). Capitalist value and linguistic slaves recombined. And a final provocative quotation from Bruno: "The Web has often been compared to our own memory, or to consciousness. There are indeed some similarities, simply because they share the same raw material: language." (http://www.christophebruno.com/2004/09/04/a-glimpse-beyond-search-engines-read_me-2004/)

[100]James Lovelock (inhis published accounts of research for Nasa) and Buckminster Fuller (in Critical Path) both suggest a relation between life and syntropy, an inversion of entropy, a resistance to the implacable force of universal dissolution. Recently Kevin Kelly (in *What Technology Wants)* rediscovered the principle and baptised it exotropy.

predictive consumption, AdSense, etc...);inversely, it has long been recognized that inanimate objects synchronize and *communicate* through mechanical forces[101].The line between life and mechanism never existed except as a theory. Humanity's sacred and scientific reinforced perch on humanist notions of free-will is unstable.

Albert Barabasi in *Bursts* contends that human actions are potentially computational; his view is not a fringe view, as mathematician his research introduced the idea of analysing networks as scale-free power-law structures. In his seminal 1999 paper[102], he outlines how network structures emerge from the preferential attachment of new vertices to extant vertices that are already well-linked. His research suggests that power-law distribution applies to networks as diverse as genetics and the internet. Olaf Sporns applies similar analysis to neurological evolution. Sporns' research shows that neurological structures developmentally self-organize in ways explicable by network theory. Network connectivity in brains follows power-laws. So do the size of cities, the popularity of artists, distribution of wealth, solar flares, etc....

Figure 15 : Jonathan Harris. *Word Count.* 2008

Power laws bridge the inanimate and animate.

[101]For an accessible video intro to the ideas, see : "Steven Strogatz on sync | Video on TED.com." http://www.ted.com/talks/steven_strogatz_on_sync.html (Accessed July 25, 2011).

[102]Barabási, Albert-László, and Réka Albert. 1999. "Emergence of Scaling in Random Networks." (Science 286:509 -512.) In *Bursts,* Barabasi claims power-law distribution does not statistically predict human location, in fact humans are more predictable than power-law distribution.

What are power laws? Power laws express the relationship between two quantities where one value changes at a rate derived from a 'power' (as in: 2 to the *power* 2 is equal to 4) of the other. The Zipf law in language is a power law that states the word frequency of a word is inversely related to the power of its frequency rank (example: 'the' --the most frequent word in English --occurs 7% of the time; 'of' –the 2nd most frequent word—occurs approx. 3.5% of the time). So power laws control distribution. This distributional network is scale invariant (like a fractal[103], looking at the curve at any degree of resolution does not change the relation).

So why is it relevant to digital poetry and the claim that animation in computation implies animism? Because, words, neurons, and internet servers are currently kept separate in ontologically sealed categories. Words are aspects of an abstract symbolic system; neurons are biological structures; internet servers are machines. This is the common sense view, a Newtonian ontology. But the shared structural aspect of these divergent things suggests a deeper *poetic* continuity, a quasi-quantum leap toward a space where humanity surrenders its preciously guarded autonomy and dissolves again into the sea of all that is: language, internet, meanings, and emergent things. And this transformation points toward a crucial dilemma or choice. Either, all items that share structure as power-law networks are mechanisms, governed by the imperturbable rigor of defined laws. Or, all of them somehow partake of life, spontaneous self-organizing.

In my view, to accept either view as a totality is to succumb to a fallacy of incompleteness. It seems preferable to conceive of a non-dualist viewpoint where both views co-exist, parallel and simultaneous (oscillating in a form of binocular-concept rivalry). Words, neurons and servers are both living and machines. Digital poetry

[103] I temper this analogy, fractals are self-similar, power laws are scale invariant.

amplifies and problematizes this non-dual bridging of categories[104]. It brings passion into contact with reason and suggests that the words themselves may want to speak, to breed with the ambient fullness of images, to contort on the writhing waveforms of sound, and to react as responsive creatures: reactive, complete and evolving.

3.2 Hybridity: things come together as they fall apart

Assimilation is a complex gradient that usually involves gradual adoption of traits. Lev Manovich's distinction between multimedia and hybrid media helps clarify the process. In multimedia "media appears next to each other"; in hybrid media, "different media forms are brought together… multimedia does not threaten the autonomy of different media. They retain their own languages … In contrast, in hybrid media the languages of previously distinct media come together" (Manovich. Pg. 89. 2008 draft). In my view, hybrid media is the end result of a process of assimilation[105].In apparent symmetry with the argument I am putting forth here, Manovich illustrates the difference between multimedia and hybrid media with the example of typography. His thoughts echo my own (so I will cite at length):

> "For instance, in motion graphics text takes on many properties which were previously unique to cinema, animation, or graphic design. To put this differently, while retaining its old typographic dimensions such as font size or line spacing, text also acquires cinematographic and

[104] Superfluous footnote tangent: the meagre popularity of poetry is also part of the power law distribution. It exists in the long tail, a niche community.

[105]Where my own view differs from Manovich is that I foresee an assimilation occurring. Manovich does not: "Similarly, we cannot use another term that has been frequently used in discussions of computational media – 'convergence.' The dictionary meanings of 'convergence' include 'to reach the same point' and 'to become gradually less different and eventually the same.' But this is not what happens with media languages as they hybridize. Instead, they acquire new properties - becoming richer as a result." (Pg. 91. 2008 Draft)

> computer animation dimensions. It can now move in a virtual space as any other 3D computer graphics object. Its proportions will change depending on what virtual lens the designer has selected. The individual letters, which make up a text string can be exploded into many small particles. As a word moves closer to us, it can appear out of focus; and so on. In short, in the process of hybridization, the language of typography does not stay "as is." Instead we end up with a new metalanguage that combines the techniques of all previously distinct languages, including that of typography." (Manovich. Pg. 89. 2008 draft)

Language's assimilation by image (and the development of a new *metalanguage)* is a story that precedes digital mediation; it begins with pictures and language occurring in the same inscription. In the following sections, I outline in rough the processes by which language and images have co-evolved toward a space where digital media (joining them with audio and interactivity) fuses them into a singular entity and makes aesthetic animism both probable and possible.

3.2.1 Language's Latent Tongue

> "…there is no intelligible language without a geometry, an underlying dynamic whose structurally stable states are formalized by the language...the structurally stable attractors of this dynamic give birth to symbols of the...language."
>
> René Thom. *Structural Stability and Morphogenesis.*20

I extracted the René Thom quotation that opens this section from an essay[106] by the digital poets Stephanie Strickland and Cynthia Lawson Jaramillo, who also contemplate the confluence of mathematical systems and poetic language. Poets, programmers and linguists each utilize recursion. Poetic recursion occurs semantically. In Chomskey-inspired linguistic theory, language is a system defined by recursive (i.e. formulaic) relations. Letterforms, scripts and signs are outward expressions of the system's underlying system. When combined with a script or alphabet, language extrudes from

[106] *Dovetailing Details Fly Apart – All Over, All Again, In Code, In Poetry, In Chreods.* http://www.slippingglimpse.org/pocode

its neurological network into a representational and contingent form.

Up until now, occidental letterforms appear mostly arbitrary, bearing little resemblance to the structures of speech sounds. Unlike ideograms which often refer to real physical pictorial processes, occidental letters seem arbitrarily conjoined. Digital technology offers space to heal this gap between form and content; by modelling the geometric resonance of speech, visually expressive letterforms emerge. Digital media offers a means to construct letterforms that more closely approximate the actual structure of morphemes (the constituent sounds of language)[107].

In the following sections, I trace a history and offer examples (from vispo, digipo, ads and media art) that show (quickly and partially) how technical methods of inscription have evolved. Previously, I described why I think visual language evolution is on a trajectory toward becoming a real-world object. The shape of these letterform objects might correspond to embodied structures: visual analogs of mathematical structures that arise from the acoustic resonance inside our bodies. It can be argued that much of proportional aesthetics (theories of golden mean etc.) arises from embodiment, evolutionary activity over millennia etching patterns in physiognomy.

What I am suggesting is that innate shapes (geometry in Thom's terms) already exist for letterforms. They implicitly underlie our oral audible language, they are subconscious sculptures intuited from the shape of diaphragm, larynx, mouth, lips and tongue. They have been etched there by speaking. Some shapes are personal, some shapes are cross-cultural. Yet it is these shapes and vibrational presences that are being given birth and dimensional form within 3D animation, ads, and digital poetry.

Audible language already existed physically so as it is mediated it is not likely to mutate faster. Interactivity (as many hypertext theorists have already pointed out) has always

[107]The somewhat untenable and radical extension of this idea is that the shape of our entire alphabet might mutate radically under the gravitational exegesis of digital media's capacity to transcribe the actual shape of speech sounds.

been part of reading, so it is not without precedent. The bulk of my discussion will therefore deal with the introduction of malleable dimensionality in language's visual aspect. Interactivity and multimedia discussions will build on these foundations.

3.2.2 Bouba/Kiki : Shape-Sound Synaesthesia

There is evidence that shape-sound-letter associations occur innately. These associations suggest that interpreting the emotive intent of volumetric typography (and *tav*, *tavt* and *tavit*) may emerge instinctively. In 1929, a gestalt anthropologist named Wolfgang Köhler reported evidence of correspondences between shape and sounds in letterforms. Round sounds like bouba were associated with round shapes; sharp sounds like kiki were associated with spiky shapes. The shape of our mouth, the physiological form of the musculature of the cheeks, the tension or looseness of breath all seem to merge together to create an associational nexus. This effect is sometimes called the bouba/kiki effect or sound symbolism. Onomatopoeia can be understood as a weak unambiguous form of this associational nexus: one that directly references or echoes a sound made externally. What intrigues me is the possibility of interior sounds innate to the words that would benefit from expression as visual forms. Cross-modal investigations by the neurologists Ramachandran and Hubbard into synaesthesia trace grapheme-colour synaesthesia to the angular gyrus: "a seat of polymodal convergence of sensory information." Interestingly, lesions to the angular gyrus lead to an inability to understand metaphor (Ramachandran and Hubbard. 5)[108].

What this suggests is that at the locus of shape, sound and semantics, various proprioceptive mechanisms arise. Humans understand shapes within their bodies; sound-shape associations have been found in many cultures.[109]Sound-shapes pairs are

[108] VS Ramachandran has even repeatedly claimed that shape-sound associations lie at the origin of language.

[109]Sound-shape associations are cross-cultural. Example: Daphne Maurer, Thanujeni Pathman and Catherine J. Mondloc. *The shape of boubas: sound–shape correspondences in toddlers and adult*.

also not arbitrary because they arise from repetitive activity: spoken muscle memory like song's scar on the trachea. Our tongues and breath passageways have memorized how to create specific sets of sounds; and thus, the morphemes that comprise language are cross-referenced as volumetric forms. Children inherit these morpheme-shape pairs as they learn words. As they say something, they feel it (i.e. *Put the tip of your tongue behind the teeth, and say sssssss … do u see the snake?)*.

In the poetic realm, sound poetry obviously investigates the acoustics of the body. Kurt Schwitter's *merz* performances recognized the mouth as a sculptural form, a tunnel for a torrent of morphemes[110]. The *Four Horsemen* performances in the 60s and 70s (continued on by Paul Dutton) explored breath and sound, scream and guttural glottal, as means for poetic expression. Joan LaBarbara, Diamanda Galas and Meredith Monk have each unknotted voice from conventional formulations. Beatbox stylist crossover poets like Reggie Watts[111] lithely intertwine pop, rap, post-modern comedy and breath-based table-esque stylings. All of which suggests a fertile range for visible text to augment the voice's innate spatiality that has not been significantly developed.

Poets are uniquely adapted to explore this terrain of embodied language. And since both volumetric kinetic text and breath-based sonic-poetry are marginal outgrowths perhaps there is a reciprocal necessity for amalgamation. A potential research direction for volumetric text could investigate how often it is accepted or rejected on the basis of widely-distributed shape-sound archetypes; as methodologies for non-invasive monitoring of neural states increases, poetic (that problematic term) experiences might

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Developmental Science 9:3 (2006), pp 316–322

[110] On a similar note, Johanna Drucker discusses the works of Ilia Zdanvich (known as Iliadz) a turn of the century book-artist futurist sound-poet who developed typesetting innovations in an invented language called *zaoum* from 1917-1923. This invented language required that Iliadz use the phonemes of language as expressive units, to essentially develop descriptive characters ("decorative elements") capable of expressing the raw units of sound.. For Drucker, "one of the most problematic of all linguistic concerns … [is that] … in spoken language the smallest meaningful unit is a single sound, [while] its visual representation frequently requires more than one letter." (Drucker. *Figuring the Word*. Pg. 200-201)

[111] http://vimeo.com/169841

be amenable to quantification. Additionally sound-shape archetypes (that correspond to the shapes our bodies make when speaking, the physiological constraints of our internal tubes vibrating as sound waves pass through them) are viable targets for modelling with digital media, -- physical synthesis of component anatomy and acoustic modeling is proliferating. Why don't we have letters that breath with us? An avatar in this region is Diane Gromala's (2000) *BioMorphic Typography* project : " a family of fonts that respond, in real-time, to a user's changing physical states, as measured by a biofeedback device."[112] Computation implies (if not the necessity then the capacity for) synaesthetic cross-modal language.

3.3 Summary Synopsis of Volumetric Argument

The following points reiterate the preceding argument

- The human body is composed of cavities that operate as sonic resonators (mouth, tongue, palate, larynx, etc…)
- These resonators take specific shapes when speech occurs
- Over millennia, shape-sound associations have developed that link morphemes (morsels of sound) with structural forms. This is known as the Bouba/Kiki effect. It is cross-cultural.
- More specific and fine-grained shape-sound associations probably exist. These embodied shapes associated with sounds and speech are latent sculptures. Specifically, these shapes are the latent shape of letters, or the appropriate geometry of clusters of letters.
- Prior to digital media, no inscription tools existed capable of depicting these sculptural archetypes (of the resonating body cavities) as letterforms[113]

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[112] http://www.lcc.gatech.edu/~gromala/art.htm retrieved Aug 31st 2011.

[113] Jason Camlot aptly pointed (in notes supplied after defence of thesis) : "Not quite true. Melville Bell's *Visible Speech* was an attempt at this in the late 19c."

- Future digital letterforms may adopt characteristics of these internal innate shapes
- As these innate shape letterforms emerge, writing with them will become an intuitive art. Cadenced and nuanced use of formal weight and texture may be idiosyncratic and suggestive of character. For instance, the speech of one character might express its subjectivity (or conceal it) through surface tensions. Another voice might be characterized by its refractory index.
- In short, as text-audio-visual (*tavs*) emerge, proprioceptive and interior aspects of our physiognomy may find means of expression through the descendants of technology such as VMRL and CAVEs in augmented reality on mobile phones and *avatart* (avatar-based art).

3.4 Summary of Aesthetic Animism Arguments

The following points reiterate the main points of the preceding animism arguments (before turning in next section to pragmatic software-studies):

- *Aesthetic animism* is a subjective attribution of life or livingness based on a perception of credible autonomous motion or systemic beauty[114].
- *Poetry* (as I define it) is both an aesthetic and an ontological act; it challenges our conception of what is living.
- Digital media introduces a very dynamic change into poetry, aesthetics and ontologies by offering letterforms the opportunity to appear to be alive.
- Enhanced by digital media, this appearance of living language heals the split that separated the written from the spoken: words are re-natured, given visual voice.
- As an extension or prosthetic of our bodies and minds, language -- once it

[114] It may seem as if the subjective nature of "credible motion" and 'beauty" constrains the argument; yet if it is understood that both *credible motion* and *beauty* are immeasurable fluid sets, dynamic complex transient categories linked by the tenuous and diverse human mind, then the problem dissipates. Subjective fluctuations become an aspect of the situation. It is not the task of poetry to isolate a singular structure or mode of expression, as much as to constantly catalyze language against definition.

assumes a body (of skinned kinematic reflective 3D) and a mind (of networked metadata memory and protocols) -- seeps across an ontological boundary.

- Physically appropriate and obedient of basic laws like conservation of momentum, gravity, collision detection, receiving light, casting shadows, and occupying space, digital letterforms appear as tangible real-world objects.
- The introduction of meta-data structures into volumetric digital text introduces memory and metabolism into language.
- This transition is not some hallucinatory revelation that transfigures society; it is a subtle gradual osmotic shift in our subconscious apprehension of language.
- The ubiquity of power-law network dynamics suggests from a different perspective that this metamorphosis of language is at another level a coming into focus of what was already there.
- The partial dissipation of ontologically-sealed categories evidences a poetic continuity: digital systems, living organisms, and language conjoined.

CHAPTER 4: **SOFTWARE STUDIES**

> "Critical Code Studies is the application of hermeneutics to the interpretation of the extra-functional significance of computer source code. It is a study that follows the developments of Software Studies ⊱⊑- and Platform Studies⊱⊑- into the layer of the code. In their oft-taught text, *Structure and Interpretation of Computer Programs*, Herald Abelson, Gerald Jay Sussman, and Julie Sussman declare, "Underlying our approach to this subject is our conviction that 'computer science' is not a science and that its significance has little to do with computers. The computer revolution is a revolution in the way we think and in the way we express what we think" (xvi)."
>
> Mark C. Marino. *Critical Code Studies and the electronic book review: An Introduction*. 09-15-10 [115]

Software studies lies at the nexus of code and culture, in an epistemological estuary that although mapped and known to exist, is still relatively untracked[116]. For practice-led researchers (i.e. artist-academics), software studies offer a chance to reflect on the interdependency of creativity and design in practice. In this thesis, software studies also connect the ontological proposal (of aesthetic animism) to empirical practice as a digital poet. Critical discourse around software is shifting rapidly. The quotation from Mark C. Marino that opens this chapter points out several ways these shifts are occurring: first

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[115] http://www.electronicbookreview.com/thread/firstperson/ningislanded

[116] As an aside: The study of software *evolution* as an academic discipline is traceable (loosely) to Meir Lehman who in 1969 wrote a report on the evolution of software for IBM (Williams. 2002). Lehman subsequently published a book *Program Evolution: Processes of Software Change* (1985) where he develops general laws of development such as the second law of software development: "The entropy of a system increases with time unless specific work is executed to maintain or reduce it." Lehman's work in the 90s on the FEAST project revealed that software development follows a "decaying growth trend" as it increases in complexity; in other words, the speed of software development is the inverse of Moore's law: it is getting slower as systems get bigger: an inverse squared barrier . This obviously explains to some degree why the GUI fundamentals of WIMP remain. But this style of general approach to the coding of software does not tell us anything about the specifics of either the historical evolution of specific interface modules (such as timelines) or the user-experience at a fundamental level.

software studies has been joined by platform studies and now critical code studies[117]. Each serves as valuable tool in an increasingly technological world. Future domains will include network studies, implant studies, and avatar studies in the humanities.

What follows is a very hands-on focus on the creation of several specific works, preceded by a meditation on temporality and the role of the 'timeline' (see Fig). I examine the timeline as a temporal construct, delineate what I know of its history, review Johanna Drucker's *SpecLab* study of temporal concepts, and meditate (briefly) on the benefits and risks of timeline systems that quantify repetition versus systems of (what I call) instrumental softwares which provoke improvisational process.

The turn toward *living language* entails authoring environments appropriate to the task, and it is my feeling that the timeline paradigm is sub-optimal in certain respects when it comes to the modelling and manipulation of (*tav*) digital texts. Time-based media, and time-based lifeforms, are not amenable to nuanced descriptions within linear quantifiable spreadsheets. And spreadsheets (as explained below) are historically the organizational paradigm that underlies the contemporary timeline. Literature is precisely the opposite: ambiguous, parallel and quality rich. Experiential time curves. As far as I know apart from the work of Drucker, the impact of linear-timeline authoring environment design on experiential depiction remains un-researched in digital humanities.

Interface design is the face of software; and software constitutes the distributed aspect of the intelligence that will make letterforms seem alive. As Lev Manovich insightfully notes, several key figures at the origin of interface design left clues that they perceived software as quasi-entity. Ivan Sutherland, who in 1963 laid the seeds for motion graphics, entitled his PhD thesis *Sketchpad: A man-machine graphical communication system.* Manovich comments: "Rather than conceiving of Sketchpad as simply another

[117] Marino clarifies: "Code for CCS is not text in the sense of a poem, a collection of signs, standing alone. Code is the text in the sense of Cultural Studies, the object of study within its material, historical context."

media, Sutherland presents it as something else - a communication system between two entities: a human and an intelligent machine. Kay and Goldberg will later also foreground this communication dimension referring to it as ‘a two-way conversation’ and calling the new ‘metamedium’ ‘active.’ (We can also think of Sketchpad as a practical demonstration of the idea of ‘man-machine symbiosis’ by J.C. Licklider applied to image making and design.”(67. 2008 draft)

Informed by an awareness of animism at the origins of interface design, I will next explore the evolution of timelines as design features, not with the intention of establishing any firm conclusions, but instead opening questions concerning creativity in quantitative environments.

4.1 Timeline Hegemony: a paradigm reconsidered

Timelines are the dominant paradigm for scrubbable media authoring; they are prevalent in most commercial and industrial softwares that work with media. (including diverse softwares from multiple domains: film-editing, motion graphics, 3D-rendering,dvd and music players, slideshows, etc...).For media consumer, timelines allow scrubbable time. Time can be controlled. For media authors, timeline interpolation operates as algorithmic suture between distinct temporal (digital) frames. The advantages of this style of animation are manifold. Fine-grained control of parameters distributed across easing curves (which permits easy repetition) constitutes an empirically-viable method for creative control. The author can iterate and tweak multiple parameters independently; time is carefully and cleanly laid out in a linear fashion; it is easy to understand chronological events. The disadvantages are more subtle to identify but relate at a very specific level to spontaneity and improvisation, and secondarily at a general level to a concept of time which is an antiseptic contingency. I hope to suggest with the following studies a necessity to retain within authoring environments, a non-timeline mode, to allow for unstructured play and exploratory improvisation.

4.1.1 Ancient History: When vases were in vogue

In 2008, a 5,200 year old Iranian earthenware bowl (with 5 drawings of a goat on it) was spun around and reputed to be a very early instance of animation (of a goat leaping to eat a leaf)[118]. In this case, the claim to animation is tenuous, but as a sequence of poses displayed on a surface, this conical surface echoes faintly the contemporary timeline's integration of visual language with chronological control. Gestural control of a bowl is in the spin; this gesture is echoed in the scrub wheel of contemporary editing suites. It is also echoed in the numerous animation tropes that occurred between ancient poetry and modern film-animation: Zeotrope (180ad), Praxinoscope, Thaumatrope, Phenakistoscope. Flip books laid out before binding; histories constructed from mnemonic principles as in ancient Rome: the conceptual legacy of timelines is vast.

4.1.2 GUI History

> "In the Augmented Human Intellect (AHI) Research Center at Stanford Research Institute a group of researchers is developing an experimental laboratory around an interactive, multi-console computer-display system, and is working to learn the principles by which interactive computer aids can augment their intellectual capability."
>
> Engelbart and English, 1968[119]

Although the history of GUIs and interface developments like the Demo at SRI (Engelbart, 1968), WIMP (windows-icon-mouse-pointer) and the evolution of PC operating systems (Vis-On, Lisa, Amiga, MS-DOS, etc…) is well documented online, the history of how individual softwares evolved and integrated their various features and grew into the complex beasts we know today is not easily found[120]. I did not find any

[118] Ball, Ryan. 2008. "Oldest Animation." *Animation Magazine*.

[119] "A Research Center for Augmenting Human Intellect", by Doug Engelbart and Bill English, in Proceedings of the 1968 Fall Joint Computer Conference, San Francisco, CA, December 9, 1968, Vol. 33, pp. 395-410.

[120] Manovich also notes that interface and software evolution often does more than just "*simulate* existing media." (pg 67. 2008 draft)

step-by-step history of the timeline as an interface module. Perhaps that is because searching for 'timeline' does not produce refined results; perhaps, software palaeontology is sparse. Many computer professionals and programmers (who create for their pleasure online archives of hardware development) are unfamiliar with multimedia software and the meaning of the term *timeline* remains associated for the most part with its analog form in historical presentations. So what follows is a tentative history, assembled from a few fragments.

4.1.3 Early Animation Software: Alan Kay, VideoWorks (1985)Amiga (1985)

"The best way to predict the future is to invent it."
Alan Kay (1971. http://www.smalltalk.org/alankay.html)

Turing Machines[121] are commonly used to teach the principles of discrete math underlying computer science. A Turing Machine is a thought-experiment that involves imagining a single frame tape reader that can read one symbol-instruction at a time. Sequentially these symbols construct and simulate the logic essential to computing. They are also remarkably similar to timelines: one frame, one symbol, and a pointer to that frame, along with an infinite memory of everything before and after. At the same time, the Turing Machine is an abstract representation of the assembly line with its sequential passage of parts past multiple time pointers. Another intriguing structural resonance with timelines reoccurs at the origin of GPUs. Graphic cards underlie all motion graphics; they are the physical architecture necessary for the multimedia revolution. They are basically pixel-based frame buffer systems: a unit of

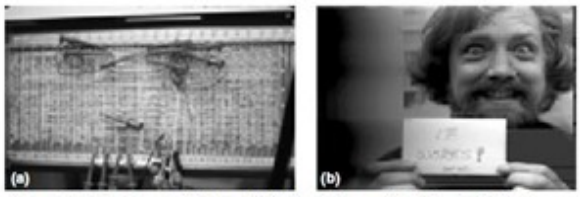

Figure 3. (a) The SuperPaint frame buffer backplane, with clipleads. (b) First image: "It works! (sort of)." Courtesy of Richard Shoup.

Figure 16: 1972. Birth of a GPU Frame Buffer.Shoup et al.

[121] Alan Turing. 1936. *Proceedings of Mathematical Society*

time-stamped data held by a pointer in memory[122]. The precursor-to-GPU pixel-based frame-buffer arose in the same era as the Sandin video synthesizer was invented and the Computer Graphics and Image Processing journal began publication[123]. So perhaps the origin of digital timelines begins at the confluence of theory (Turing machines), digital hardware (GPU frame buffers), efficient capitalist productivity (assembly line) and cartoons (cell animation).

The truth is probably more prosaic and ancient. Timelines are a specific case of charts. A diversity of ancient accounting systems and mechanisms all use some sort of a timeline: pulleys, gears, film sprockets, axles, abacus style devices, grinding mills, Cabbalist divination wheels and even mandelas[124]. Software (like all culture) soaks up paradigms; remediation[125] is conceptual reincorporation.

It is also probable that the commercialization of the software timeline was born when cel-animation met computation[126]. In 1990, Disney in conjunction with Amiga (which had a dedicated hardware system for multimedia before the PC) developed a commercial software package. In promotional TV demos of this package (available

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[122]Again I am endebted to Manovich for making me aware of Richard Shoup's article "SuperPaint: An Early Frame Buffer Graphics System," in which he describes the making of "SuperPaint, one of the first pixel-based frame buffer systems" at the Xerox Palo Alto Research Center (PARC) in 1972. This occurs in an era when 2kb register chips were high tech. Shoup implements what he calls a "synchronous recirculation structure" (pg 32) that held a single frame in temporary suspension in an array of register chips. This emulates, neurologically, a loop in short-term memory, a physical buffer for temporary information stored at retrievable granularity.

[123] Source: http://sophia.javeriana.edu.co/~ochavarr/computer_graphics_history/historia/

[124] Jason Camlot (in post-defence notes) suggests another example: "Mary Poovey's *History of the Modern Fact* on double entry bookkeeping."

[125]J. David Bolter, *Writing Space: Computers, Hypertext, and the Remediation of Print*, *2nd ed.* (Mahwah, N.J: Lawrence Erlbaum Associates, 2001).

[126] In the 1970s at Xerox Parc, Alan Kay and his team building on the insights of Engelbart's demo developed animation softwares using SmallTalk; these did not see widespread use.

online[127]), the primary authoring screen clearly has no timeline. Creative work occurs in a cel-animation style space where the animator controls (with keystrokes) the amount of onion skinning. Animation occurs automatically. The environment conforms to the classic Greek metaphor for time: a human walks backwards into the future, its most recent trail fading away behind it. The future is unknown.

Without a timeline there is no future, there is only the present moment. The animator is not supplied with visual evidence that a future exists and that time runs straights then ends. Teleology, with all it implies (origin, progress, Armageddon etc…), does not exist. Non-timeline design environments are the visual equivalents of oral cultures. The animator must remember the set as junctures that contribute to a totality.

However, in the 90s more complex animation projects must have demanded methods for remembering scenes and the ability to jump visually from one time to another. A software 'evaluation' article from *Compute*, issue 143, 1992, reveals how a timeline-like module (2 years after launch) has been added to (or always existed in) the Disney Animation Studio. It is called an *Exposure Sheet*. Functionally it is compartmentalized off from the main real-time cel-style animating mode. The promotional blurb is informative: "Disney Animation Studio's Exposure Sheet, accessible from the Pencil Test, works rather like an animation *spreadsheet*. Each cel in the animation is given a line in the Exposure Sheet, showing the cel number, assigned sounds, timing, and other information. You can rearrange cels of an animation in the Exposure Sheet by cutting, pasting, or deleting their lines, which is much easier than cutting and pasting cels in Pencil Test." (Anzovin. 1992. My italic).

Note the metaphoric reference to *spreadsheets* in the promo material; timelines are sold as organizational efficiency tools. Spreads are essential for the rapid dissection of quantifiable data. Primarily used in accounting and inventory, spreadsheets induce

[127] Amiga-Disney Animation Studio demo: http://www.youtube.com/watch?v=qSeYivHZpB8

precise analytic calibrations of data; it is difficult to envision the purpose of displaying ambiguous evolving emotional experiences in spreadsheets. Spreadsheets are spaces for keeping track of data, they are tabulation tools, interface panopticons, grid databases. So does it mean anything that the timeline grew from a spreadsheet metaphor? As a ubiquitous feature of contemporary animation software, do timelines introduce quantification and product analysis into creative process? Based on my research-creation practice, negative impacts emerge from timelines when they become the sole mode of animation, -- provoking the neglect of live improvisational instrumental authoring environments.

In 1990 (accepting the 1990 release of Disney Animation Studio as some sort of benchmark not of research software but of commercial diffusion), the timeline function of examining creative process as a production line is kept separate as a module; *Exposure Sheet* (timeline) mode is secondary, to be consulted as necessary, as an adjunct to creative flow. At this stage of animation software design, time-based structural analysis is a mode of approach to be used occasionally during creation. The branches of creative process (real-time) and organization (timeline) have been grafted together in the same device, but they are not superimposed. Modelling and animation occur together, but independently of the *Exposure Sheets*. A non-quantified non-timeline view is the default; fluid gestural flow and crafting frame-by-frame are the dominant paradigm. Then the situation reversed; at some point in the 1990s, the default layout became the timeline. The non-timeline view occasionally remains as an option, a vestigial configuration.

In other words, in contemporary authoring softwares, emphasis inverts. Timelines (animation *spreadsheets)* are now the dominant mode; free fluid real-time animation environments become secondary and marginal. The hand is not as trusted as the heart of the machine; an algorithm rules over the ability to interpolate, to guess what fills the gap between key moments. And with this subtle transformation in design paradigms, animation shifts away from choreography and sculpture toward a mechanist model.

Strangely enough, it is perhaps this transition that needs to be re-examined if a living language is to emerge. Biological clocks do not run on straight lines[128]. Nature's clocks follow cycles, mushy gradients, seasonal spirals; Salvador Dali's clocks melt and bend.

4.1.4 Timeline's Fundamental Parts

Timelines are narrow strips of unidirectional temporal flow. Their pace quantifies without eddies, an antiseptic pipe that runs along narrow tracks. They are composed of several fundamental parts:

- a horizontal straight line(s) that goes from the beginning of the time to the end
- a point(er) [usually drawn as an arrowhead] that represents the present moment
- a display window that shows that present moment

Ancillary parts (that are not necessarily part of all timelines): zooming mechanisms, frame markers, cells. The animator moves step by step through that environment as she would through inventory. The production environment is a warehouse of boxes, clips, frames, windows and menus (stacks). The timeline always remains linear and straight. It cannot be bent or fork or break into multiple strands. Bifurcations can be built in through nesting (compositions or movie clips), so that in actuality the timeline is like a single stalk of the main timeline with multiple looping repetitive sub-timelines occurring. Yet the animator/poet does not see the interface timeline like a tree. There is no generic way (or software that I know of) that allows the user to see a timeline's multiple branching time, nor is there any implementation of independent time signatures on different timelines in the same project. Once the clock starts ticking it runs to the end.

The metaphoric and ontological implications of these fundamental and seemingly

[128] Even though RNA transcription and even the direction of thermodynamic entropy follow what can be understood as linear sequences, there are always branchings and bifurcations in the flow of organic events. Mechanistic and error-correcting, DNA replication might seem to require a linear timeline but the massive parallelism of the process suggests a level of complexity far beyond the capacity of a unidirectional singular line.

innocuous design elements are unexplored terrain[129]. Are temporal implications implicit in interfaces? Does this effect how we as users/viewers/people think of time? Or is it the reverse: do these design elements arise from an innately human instinct of what time is?

Specifically: Is it possible that the paradigm of malleable living language requires an authoring environment where multiple modules of intersecting flow exist simultaneously?

4.1.5 Implicit Principles of Timelines

> "…when poets compose with timelessness in mind, they will always be on the route to originality."
>
> Christopher Funkhouser. *Prehistoric Digital Poetry.* Pg. 255

Stating what is implied by interface design is a tricky business, fraught with potential for mistakes. Nevertheless, given the fundamental parts of a timeline, the following beliefs seem implied by its structure.

- Time is linear.
- Time is unidirectional.
- Time can be broken into units.
- Units of time are frames. Frames are discrete moments.
- Frames can be frozen.
- Time is never known outside of the frame (until the process of render).
- Time has a beginning and an end.

[129]Except for the rare software studies article, Wardrip-Fruin, Matthew Fuller, and Drucker's *SpecLab* (discussed later in this thesis). And again Manovich: "… although a particular software application does not directly prescribe to its users what they can and cannot do, the structure of the interface strongly influences the designer's thinking." (176. 2008 draft)

4.1.6 My Claims about Timeline

Considered as a whole, the above list presents a bleak cosmology: a teleological dystopia that if applied to experience would convert existence into a meta-Kafkaesque plod from birth to death. On the other hand, it reflects pragmatic reality. Task-use efficiency is (at a general level) synonymous with compartmentalization. It would be foolish to claim that interfaces using this model are ruining their users' capacity to conceive of flexible bifurcations, ambiguous reflectivity, and/or intersecting life-stories. There is no shortage of soft subtle emotive and intuitive movies and animations produced using these devices. I have no interest in stating a polemical case.

But I am claiming that in some instances (when timelines eradicate *instrumental* options) the timeline introduces an implicit model which places the creative practitioner at a distance from immediate temporal feedback with their materials. A classical musician develops sets of muscular reflexes attuned to changes in the matter of their instrument; these reflexes occur subconsciously, instinctively at a muscular level, neurologically in the dorsal brain; these subtle cues are not accessible within most timeline software which requires that the machine stop while parameters are changed.

By separating run-time from work-time, timelines deflect the creative process into modular contained moments. The assembly-line metaphor may function well in some circumstances where flow can slowly evolve as it might for a wood or stone carver who steps back and considers the process, continues, steps back, in a repetitive dance of proximity and distance. Yet traditional sculptural materials (wood, stone, metal) are static matter. Malleable dimensional texts (as focussed on in this thesis) are temporal entities. They change. Stepping back from change may provide the opportunity to assess independent frames, but timeline-imposed distance removes the creator from the momentum of process. Tactile reduction replaces relation with a living entity. Straight lines refute cycles.

As Stephanie Strickland and Cynthia Lawson Jaramillo note, both code and poetry

involve loops. Poems invoke semantic loops in the readers, spaces of retracing. Code is also structurally founded on iterations: "People think of going forward in reading poetry, but the very turning of the line is in constant conflict with that goal, as are the triple realms contending for meaning. Neither poetry nor code proceeds by forging ahead"[130].

Strickland and Jaramillo are not alone in this diagnosis, for Douglas Hofstadter *strange loops* permeate aesthetic experience. And I can add my own voice to this chorus: in 2001 I wrote an essay which compared recursion to poetic impact in which I stated: "poetry and programming share more than strong affinities. Each is language-based, obsessed with conciseness, consistently evolving, modelled on consciousness, and inscrutable to the uninitiated (think of James Joyce reading C++). Each uses language in ways that involve leaps and circular paths; each requires an arduous concentration that ultimately relies upon reasoning which invokes intuition; and each is closely related by a shared goal of precise communication of complex realities. "[131].

Creative authoring requires interface design respectful of the sinuous paths of creative process and the recursive foundations of semantic epiphanies.

4.1.7 Homogenous Granularity

> "Diagrammatic representations of temporal relations fall into three basic categories: *linear*, *planar*, and *spatial*. Linear diagrams, or timelines, are by far the simplest and most prevalent forms. … The timeline is a linear spectrum with homogenous granularity. On a linear diagram data can exhibit only three relative temporal conditions: *earlier than, later than,* or (sometimes awkwardly) *simultaneous with* (or overlapping)"
>
> Johanna Drucker. *SpecLab.* (49)

Johanna Drucker's notion of the timeline's *homogenous granularity* in *SpecLab* (cited just above) is the only research I am aware of that has directly questioned the cultural

[130] http://www.slippingglimpse.org/pocode *Slippingglimpse* was published in HyperRhiz .

[131] *Programming as Poetry: A few brief musings on Antiorp, Kurzweil, and Stallman* http://www.year01.com/issue10/programmer_poet.html

implications of temporality in interface design. In chapter 2.1 *Temporal Modelling* of *SpecLab* she gives an overview of the research she and her team conducted into the models that underlie an exploratory design response to a software initially designed by John David Miller and John Maeda[132]. Drucker explains that in spite of the cleverness of the software "in its use of screen space and creation of conventions for ordering materials, it was based on what I considered non-humanistic, objective conventions. Such timelines are derived from the empirical sciences and bear all the conspicuous hallmarks of its basis in objectivity. They are unidirectional, continuous, and organized by a standard non-varying metric"(37).

Having reached similar conclusions independently, I am in agreement with Drucker when she continues to outline how linearity is not conducive to capturing experience. She uses the words "almost useless for describing the experience …"(37) of complex felt events that might have many simultaneous components.

Much as I agree with the general direction of Drucker's argument, and to some degree the case-studies that follow are based on a similar premise, there is a general empirical objection to this claim. Films for the last decade have been created using timelines in software, yet the emotional complexity of films has not deteriorated. There are many nuanced special fxs constructed using timelines that are strictly linear that as final product contribute to very humanistic goals, depictions of experience that are rich and nuanced. Case in point, the final shot of Tarkovsky's *Solaris*, is an apex of modernist humanism. Evidently, there is a very subtle way that humans separate process from end result. Process does not necessarily contaminate product. Intention is encapsulated. The surplus of nuanced projects emerging from timeline-based software thus is a strong objection to arguments for the 'non humanistic' aspect of timelines. In addition, the prevalent use of *nested timelines* permits *simultaneous with* perspectives to occur. And

[132] Miller and Maeda produced a prototype software as part of a Temporal Modeling Seminar in June 2001. http://www2.iath.virginia.edu/time/research/archive/visual.html

loops within loops, hierarchies, inheritances and modules are inherent to programming, so the linearity of timelines is only apparent; beneath the surface abstraction of the interface, recursion rules.

Yet Drucker's argument is itself nuanced and exploratory; she does not claim absolute opposition; instead she suggests that alternative modalities exist which might instigate modes of creativity more appropriate to human experience. Her view promotes warped, spatial and "topographic images of temporal events – a time landscape – with the idea of being able to map experience…"(Drucker. SpecLab. 59).The ideas are not implemented, yet the actual process of thinking through them constitutes an exercise in creative interface design within a field that has not changed radically since the epoch of Sutherland, Engelbart's demo and Alan Kay at Xerox Parc[133].

What has been revealed in the previous section is how paradigms of temporality (conveyed by the dominant presence of the timeline) might be constraining creativity, and particularly literary creativity, at some points. Obviously to claim that timelines eradicate the capacity for subtle work is untenable. What is tenable, however, is the inevitability of transformative change in interface design. In particular Johnanna Drucker precipitates an awareness of software's temporal bias toward linearity; and Matthew Fuller points to technology as cultural; both utilize references from structural linguistics, psychoanalysis, film theory and cultural studies. Added to these references, insights from information visualization and the so-called studio or plastic arts (such as sculpture) suggest that tangible feedbacks and real-time instrumentality must be incorporated into future typographic interfaces. In the following section, these threads of temporality and tangibility are subsumed within empirical case-studies of specific creative processes.

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[133] Interface stability (stagnation?) since *The Demo* (1969) is widely commented upon. My feeling is that stagnation probably results from the tendency of human endeavours to map out the potential state-space of new technologies very early and quickly, before getting into the steady middle-maturity pattern of making systems more robust. If this hypothesis is correct, then we can expect a period of what Kuhn might term transformative change in the near future as the emergent momentum of technology unfolds a new set of regions (unfurling like smoke) for ubiquitous always-on networks in near-field communication.

4.2 SOFTWARE CASE STUDIES

Each of the three following software case-studies is an attempt to examine the ontological considerations of aesthetic animism in empirical context and to see how the subtle confluence of temporality, design and animus intermingle within a digital practice. It is also an attempt to write software studies from the perspective of a practitioner, to move between conceptual speculation and historical overviews down to the discrete minutia of interface details. In the process, I hope to reveal the value of tangible software instruments that permit real-time play of sculptural letterforms.

4.3 SOFTWARE CASE-STUDY : Compositing After Effects onto Poetics

> "Everything was becoming conceptual," Duchamp explained: "that is, it depended on things other than the retina." (in *Against Expression*, Craig Dworkin's intro http://ubu.com/concept/AgainstExpressionTOC-Essays.pdf)

After FX often elicits a reactionary repulsion from those in the occidental avant garde. Duchamp fetishism can tend toward untenable absolutes. From a modernist avant-garde perspective, conceptualism's capacity to re-contextualize is considered laudable sophisticated self-reflexive cognition, while the ability to contrive is mere manual labour, playing with the surface of the mind without awareness of its structure. Graphic activities are castigated as hedonism incapable of yielding meta-aware stances. And the eroticism of the eye is seen as a superficial Hollywood film full of fake explosions, extruded aliens and rogue nebulae. In short, special FXs are associated with cartoonish hypnotism, commercial mind manipulation, and masturbatory immaturity.

Yet I am here to argue (as clearly as I can) why compositing softwares, which are behind many of the world's most glitzy motion graphic campaigns, deserve recognition as precursors to a truly digital 21st century word processor.

Why are the glitz and glam not mere effervescent by-products of puerile imaginations incapable of really grasping the crucial role of abstraction in an information economy (or

the primacy of a self-reflexive materiality in art practice)? Because (to put it simply), occasionally motion graphics are also the expression of the deepest felt sentiments experienced by any of us; they grapple with the ignorance that is at the core of existing, the mystery of self, the role of humanity in a universe whose scale exceeds our capacity to comprehend it. Surfaces (do sometimes) contain concepts. Naïve aesthetics play a nourishing role in the evolution of representation. Discourse must be built around even excluded or marginal (dynamic visual typography and poetic) practices.

John Berger, in his 1976 essay *The Primitive and The Professional*[134], insightfully suggests that conventions and cultural class systems distinguish between the professional and primitive artist. The professional, trained and articulate, approaches art with the idiom of academia. The primitive arrives at art later in life, crudely, as a means of expressing lived experience. The resistance and ridicule met by primitive artists is due to the turbulent protective reflexes of the dominant professional caste whose definitions of what constitutes correct aesthetic goals define a carefully-guarded commercially-viable field of discourse and practise. Discourse self-reinforces. My argument for the relevance of compositing to writing is (in some respects) an appeal for the inclusion of digital primitives, the basement auto-didacts of gloss, exuberant home-brew authors expressing their poetic instincts with contemporary motion graphic tools[135].

4.3.1 Ancient History: George Meliés and the Heel of Time

One of the first overviews of kinetic typography in book form, Bellantoni and Woolman's *Type in Motion* (1999), identifies George Meliés advertising work as the earliest known example of film-based animated typography. Unfortunately, most of Meliés' footage

[134]John Berger. *About Looking*. Pg. 71

[135]Perhaps my sympathies lie with the primitives because I did not earn an undergrad degree until I was in my mid 30s. My knowledge of theory did not develop until I entered grad school. And my artistic instincts were forged in an atmosphere of auto-didactic impassioned exploration. So while this thesis is ostensibly a theoretical and methodological exercise, I also conceive of it as a primitive's theory, an outliers tale.

does not exist today, time literally marched over it: it was melted into use as boot heels during World War I. Nonetheless, motion graphic typography began with Meliés and his contemporaries. He was among the first (or the first) to use multiple exposures which essentially is a precursor to compositing: it is still one of the novice tutorials in *After Effects* today: camera on tripod, mask down the middle of scene. Result: you stand next to yourself. This is the preliminary epistemological lesson of film: truth is subject to manipulation. And it also provides more evidence that appearances are conceptual.

4.3.2 Motion Graphics: IBM's first Artist-in-residence John Whitney

The origin of the term *motion graphics*[136]begins with John Whitney who in 1960 started a company called *Motion Graphics*. Whitney was obsessed by principles of harmony that occurred between visuals and music: proportional systems with mathematical foundations. Noting how baroque counterpoint and Islamic arabesques were tractable subjects for computation, he created abstract synaesthesia. In 1958, he collaborated with Saul Bass on the titles to Hitchcock's *Vertigo*, a collaboration which places him at a key event in the evolution of dynamic typography. In the 1980s he became concerned with real-time computer instrumentation, -- a prescient position given the crucial roles of PureData and MaxMSP in contemporary media art. His work, as Holly Willis notes, shares the idealistic propositions put forth in 70s by Gene Youngblood[137].

4.3.3 After Effects: A Brief History of Hybridity's Origin

> "The new hybrid visual language of moving images emerged during the period of 1993-1998. Today it is everywhere. … it is appropriate to highlight one software package as being in the center of the events. This

[136] It is a story often told: it is on Wikipedia and can be found in many texts on video. I relied for details on "Digital Harmony: The Life of John Whitney, Computer Animation Pioneer", William Moritz. *Animation World Magazine* (Issue 2.5, August 1997) and Holly Willis who in *New Digital Cinema: reinventing the digital image* (2005. 9) states that John Whitney "founded a company called Motion Graphics incorporated in the 1960s and IBM hired him as its first artist-in-residence…"

[137] http://hollywillis.com/?p=95

> software is *After Effects*. Introduced in 1993, After Effects was the first software designed to do animation, compositing, and special effects on the personal computer."
>
> Lev Manovich. (118. *Software takes Command.* Draft 2008)

Lev Manovich is the only media arts scholar (*scholart*) that I know of to have considered the history (and developed a sustained discourse around the role) of *After Effects*. Manovich identifies the release of *After Effects* in 1993 as a key date in the emergence of media hybridity. Even though many contemporary compositing packages do the same sort of work, for Manovich, *After Effects* is important because it is affordable: its affordability transformed compositing from an esoteric high-end technique into a grassroots commercial preoccupation.

According to my argument so far, composting contributes to *assimilation*, the capacity of language to chameleon into its environments. Similarly Manovich sees the aesthetic of motion graphics toward *hybridity* as a *Velvet Revolution* that occurs in the era 1993-1998. During this time, according to Manovich, graphic design and typography were imported into motion graphics; this importation (in my terms: assimilation) transformed and fused disparate disciplines and gave rise to new aesthetic hybrids[138].

Prior to *After Effects*, dynamic and kinetic typography obey arduous technical and financial constraints. One precursor artist-poet who defies those constraints and anticipates some aesthetics of motion-typo-graphics is Marc Adrian. Adrian was one of the artists featured in the *Cybernetic Serendipity* exhibit at ICA in 1969. In 1963, he had constructed films which were based on procedural workings (what he called "methodic inventionism"). Adrian's method eventually expanded into working with text processed by computers. He is considered one of the pioneers of film structuralism; yet also can be considered one of the forerunners of kinetic poetry as a hybrid filmic and computational

[138] http://lab.softwarestudies.com/2008/11/softbook.html

medium. *Text I* (see the image in *Cybernetic Serendipity*[139]) echoes the Flash-based work that has proliferated in the last decade. It exhibits a "fluid aesthetic quality" (Funkhouser. 95)[140]. I have never seen these run, so all my comments are extrapolations from the literature[141]. But based on similar independent-artist works from that era we can assume they were of rudimentary visual quality. It is exactly these sort of technical and financial constrain that affordable compositing, with the birth of *After Effects,* dissolves.

4.3.4 Kinetic Type, Compositing Suites & The Hybrid Canon

> "In the civic imagination, science is still considered dull, geeky, hard, abstract, and, conveniently, peripheral, now, perhaps, more than ever."
> Natalie Angier. *The Canon.* [142]

Replace the word science in the above quotation with the word poetry. Angier wrote her book to reverse public perceptions about science's canon; I hope (perhaps imperceptibly) to contribute toward the acceptance of digital poetry into the traditional poetic canon. Problematically, digital poetry is new-born; its canon is emerging and currently indeterminate. And how is it that *After Effects* fits into this argument?

In conventional literary theory, a canon (the set of works considered worthy of study) is

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[139]To see an image please consult my *Digital Poetry Overview* blog at http://glia.ca/conu/digitalPoetics/prehistoric-blog/2008/08/20/1963-marc-adrain-text-i/The image source isReichardt, Jasia, and Institute of Contemporary Arts (London, England). 1969. *Cybernetic Serendipity: The Computer and the Arts*. New York: Praeger. pg. 53.

[140]Funkhouser also highlights how the procedural aspect: "Adrian' piece is important for several reasons. The 'computer texts' are among the first examples of works presented with unconventional 'syntax', permutation and aleatoric reordering of pieces of language.

[141] Canyon Cinema: The Films of Marc Adrian. Available at: http://www.canyoncinema.com/A/Adrian.html [Accessed August 23, 2008]. Adrian describes his earliest film (*Text I*. 1963, 35mm, b&w/so, 154sec) using this hybrid method of computers, text and film, "The films TEXT I and TEXT II are a mere permutation; TEXT I results from a memory program of a computer. The words were chosen by the challenge that they can be read in English and German alike with no change of meaning."

[142] http://www.natalieangier.com/main.php?id=the_canon_excerpt

the focus of both dispute and reverence. The contemporary occidental literary canon is, very generally, a by-product of the printing press: a huge forest of literature. To summarize a story often told by historians of technology, mass-produced books modified the dynamics of publishing from elitist scribe to populist broadsheets and independent artisanal presses[143].

What I am proposing (in parallel with Manovich) is that a similar transformation of motion graphics (and specifically kinetic typography and thus digital poetry) occurred with the release of *After Effects*. As the scale, scope and sophistication of *After Effects* surpassed critical mass, an auto-didactic tutorial-frenzy occurred. Recursive feedback fed radical experimentation which was rapidly assimilated into effect presets and new capacities in the release cycle. Creative production exploded in the communal estuary of *After Effects* users: aesthetic curiosity, growing computer use, Moore's law, entry-level compositing, exchange forums and online video tutorials. This symbiotic flourishing of technical means and artistic impulse is symptomatic of an incipient canon. The canon is a hybrid. It exists in the interstices between audio-visual art and literature.

It is my feeling that kinetic type's printing press is not the word processor but synergetic combinations (or suites) of software and code such as *Mr Softie, Mudbox, Processing*, *Flash, Javascript,* and *After Effects.* These distinctly different softwares each offer a unique modality for dealing with kinetic type, yet each offer quick easy access to textual transformations. Each (to varying degrees) combines fluid motion with the capacity to composite text into combinations with 3d models, video, images and/or sound. This textual fluidity constitutes a breeding ground for the birth of a canon. Already signature motion-graphic styles and formats of typographic manipulation can be identified[144].

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[143]Daniel Defoe and William Blake were both vanity-press publishers. They stand in the same relation to the canon as contemporary self-publishing web-poets (such as Jim Andrews, Brian Kim Stefans, Talan Memmot, J.R. Carpenter and Stephanie Strickland) stand in relation to the incipient electronic literature canon.

[144]Example: the music video *Go* by Kayne West cited by Manovich is a classic example of the fusion of

Expert users can spot software chains, effects or combinations of sets of effects. The lineage or inheritance of various artistic styles or innovations (often fused into new variations) is readable by an informed viewer.

In the same way that a literary scholar can identify writers who have inherited (or appropriated) stylistic influence from Virginia Woolf (for example), it is possible to trace the roots of many motion graphic typography experiments to the production software (or suite of softwares), the technique of the *evangelist*[145] who first taught or popularized the technique, and the visual birthplace of the typographic style as logos or credits for film and TV companies[146]. Literary scholars might shudder at the suggestion that the contemporary literary canon was born from a complicit field of corporate propaganda and/or music videos, but it is plausible to re-situate Homeric epics and threnody as ancient rock songs sung to warrior kings to glorify conquests. So it is not unknown for canons of enormous sensitivity, emotional range and humanist sensibilities to arise from origins proximal to greed, glam, glitz and aggression.

4.3.5 Is Compositing only Gloss? Bi-Stable Decorum.

> "The textual surface is now a malleable and self-conscious one. All kinds of production decisions have now become authorial ones. The textual

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Wacom tablet and *Illustrator* quasi-3D vector aesthetics composited over video; the origins of its clean line style are Bauhausian. The style of text also references the baroque typographic flourishes that *After Effects* (with its eased point-based key-frame masking) permits; a style popularized during the *Velvet Revolution* in ads and later websites. It is an irony of the age of excess information that the exact origin point of a meme (such as the baroque mixed with Bauhaus Illustrator compositing) is unidentifiable without extensive historical forensics.

[145]In a curious sociological echo of spiritual loyalty, software technicians call themselves *evangelists* and preach to the consumers (the *converted faithful*) distributing interpretation of the various manuals in books called *Bibles*. From such fervent group dynamics that leverage ancient instincts for bonding and salvation, skills emerge as litany, styles contribute to elements of identification, and shared scripts contribute a sense of becoming unique through belonging.

[146] A strong stylistic example of visual appropriation is the video DVNO by the band Justice as discussed earlier in the section on music videos, it visually riff references numerous archetypal (and by archetype in this context I mean: immediately identifiable to those raised on a particular post-war to 2000 diet of TV and movies) progenitors of the motion graphic canon.

> surface has now become permanently bi-stable. We are first looking AT it and then THROUGH it."
>
> Richard Lanham. *The Electronic Word.*1993 (5)

It is easy to dismiss compositing as mere technical innovation, cosmetic trivia. Yet its potential implications for writing as an activity that involves the entire being of the author get clearer if seen historically.

Jay David Bolter (in 1991) wrote: "Wordsworth's definition of poetry as a 'spontaneous overflowing of powerful feeling' does not easily include electronic poetry" (153). Bolter wrote this statement prior to *After Effects* in reference to hypertext. Hypertext in that 1991 era of low-bandwidth (almost pre-web) was minimalist: a few words and an underlined hyperlink. Computer graphics were weak, *difficult* and not affordable to most authors or readers. To author digital work in that era required a concentration that precluded spontaneity. With each year, composting tools and exponentially more powerful GPUs modulate that difficulty; with contemporary technology, spontaneity is an option, the computer is no longer antithetical to 'powerful feeling'.

For the young digital natives who engage (both today and in future) with computation, navigating plug-ins may become as innate as putting quill into inkpot, reading interfaces as easy as speech. That is to say, speech (which is a learned skill requiring years of immersive assimilation to evolve from babbling to coherence) develops in ways analogous to digital ease-of-use. Spontaneity takes time, absorption and immersion; it involves muscle memory and innate dorsal reflexes; it requires immersion in an idiom and the cultural techniques specific to a technology. And while spontaneity can engender gloss, it can also generate depth and access processes of profound reflective interiority.

In his 1993 book, *The Electronic Word*, Richard Lanham, a rhetorician, anticipates many of these issues. Lanham feels that a new theory of literature will be needed for electronic texts; he proposes a theory based on a matrices of oppositional values, what he calls a "bi-stable decorum" (14). The primary opposition is between looking AT and

THROUGH a text. Basically, the AT is self-conscious reading of the materiality of the medium; the THROUGH is immersive unself-conscious absorption of textual content. Critics of the use of *glossy* effects in digital poetry might warn that gloss and glamour (etymologically rooted in illusion) perform a paradoxical trick: in fixating the reader's attention on surface effects, the reader never actually sees what they are looking AT. At the same time, the THROUGH reading is deflected and what is read is a surface by-product, a fake trope. Many proponents of materiality (critics of immersive absorption) imply that in FX-rich environments reading never occurs; it is short-circuited into narcissistic display.

These critiques may certainly have validity. Modes of aesthetic excess may temporarily obstruct semantic meaning or deflect cultural interventions. Yet later in his book Lanham makes several "oracular speculations"(127) that mitigate against critiques of visual-hybrid literature : "writing will be taught as a three-dimensional, not a two-dimensional art … Word, image, and sound will be inextricably intertwined in a dynamic and continually shifting mixture. Clearly we will need a new theory of prose style to cope with all this. … I am talking about a theory *superior* to any that print allows us to conceive, but which would include print as well as dynamic alphabetic expression"(128. *His emphasis.*)[147]. So given the twenty years that exist between Lanham's oracular proclamations and our own era, what would such a *superior* hybrid theory look like? In the following section, I attempt a tentative step along that path by suggesting that compositing as a term offers theoretical affordances appropriate to the task.

[147]Lanham also presciently predicts that spelling in an era of digital spell-checkers is probably not as important, and that the essay form will evolve into something else. In this pronouncement I am in agreement. Over the course of this thesis I have begun extracting excerpts from this thesis to blog them, I invariably condense, shorten as I post. I also think often of the words of Jonathan Franzen who pointed out that research in an information-surplus culture is obsolete. The humanist emphasis on fact-checking and historically-grounded argumentation may dissipate and be replaced by insightful filtering.

4.3.6 A Tentative Hybrid Theory: Composition

Composition has roots in both writing poetry and imagistic technology. In *After Effects*, units of work are called *compositions*. The name derives from the technique of compositing or keying out parts of an image so that the keyed parts disappear and layering effects can occur. In the oracular arts, composition refers to the ancient act of composing (as in *composing an ode* or composing a poem or symphony); composition is often conjoined with rhetoric, it is synonymous with the act of sustained writing.

Composition is thus a word etymologically and historically situated to operate at the interstice between writing and audio-visual art in a new theory of hybrid literature. That is why I believe that compositing tools like *After Effects* are probably forerunners to the sort of tools that the next generation of *tavit* poets will compose within. The level of complexity and depth of immersive experiences possible with such tools exceed those of a word processor by an order of magnitude; and they offer the affordance of terminology like *composition* that has ancient roots and a contemporary usage.

One could compare composited to print textuality, as 3D to 2D, perspectival to flat representations. Composition in its expanded sense here operates as a measure of the level of visual depth and procedural complexity offered. As in rhetoric's labyrinthine terminology, *compositing* will probably undergo terminological fracturing as subspecies arise. Critics knowledgeable of the history of compositing will read visual language within a historical perspective: shadow-play, cut-outs, collage, the evolution of integration. Their inter-textual conversations will concern how text assimilates or evolves motifs in conjunction with its video, code or generative backgrounds. Simultaneously bi-stable they will also read THROUGH the text to analyse and absorb what the words are saying.

As much as choreography and easing equations need to be considered as literary devices (an argument I alluded to in my Masters thesis, but also a point made by many other commentators on kinetic text), raycasting, polygon counts, recursive scripting and

other qualities and effects possible within compositing software operate as semiotic tools. To speak authoritatively in this hybrid literary domain requires such terms implicated in the creative process.

Figure 17: *Ed is Dead* (2009) Still from animation by author created in *After Effects*

Saussure's arbitrariness of the sign, the way its visual does not relate to its meaning, may undergo erosion. Digital composting incubates signs toward non-arbitrary forms; it recruits form as semantic protagonist (elevating it from subsidiary support role). As visual choices made by visual poets refute the canonical transparency of the text, the AT becomes read as a THROUGH. The bi-stable decorum proposed by Lanham dampens into apparent concurrency. As I stated earlier, I believe that digital modelling constitutes an opportunity to sculpt letterforms into structures congruent with our archetypal proprioceptive embodied conceptions of them: conceptions reinforced by millennia of physically resonating with speech sounds. Compositing augments that opportunity by allowing semantic meaning to resituate itself in real space. The formal qualities of the

page, the line, spacing, line breaks, and all subsequent print experimentations[148] enter into a 3D contextualized spatial and auditory semiotic space. It is not easy to conceive how deep (or even cursory) readings of this material will occur without a new theory and a hybrid theory that draws from cinema, gaming, programming and literature.

A term (such as 'compositing') is not a theory, it is merely a seed for a theory, a stand-in or substitute until the actuality arises. Converting 'compositing' from term into theory is beyond the scope of this thesis. However, the preliminary steps would involve a comparative analysis of analytic tools from literary cinematic and new media studies. Questions: If compositing is a literary device, then what sort of device is it? And is it possible there already exists a cinematic term that might function? A quick list of literary devices: allegory, alliteration, allusion, analogy, assonance, climax, foreshadowing, hyperbole, metaphor, onomatopoeia, oxymoron, personification, pun, and simile. A quick list of cinematic techniques: cinematography (close-up, medium, long, establishing), mise en scène, moving and position of cameras, lighting, special fxs, and montage. Essentially, there is nothing in either list specific to the superimposition of text over/within visuals (except for composting itself). Compositing shares with metaphor, analogy and simile, a conjunction of items. These techniques bring disparate things or qualities together and by placing them together reveal or generate a semantic discharge. However there is no existing theoretical frame for how to critique composited text. The best that can be hoped for at this juncture is sensitive observers who evaluate instinctively using hybrid theories.

Theory from previously independent disciplines (cinema, gaming, literature, music) must also be composited over each other. Thus compositing occurs at practical and theoretical levels.

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[148] Experiments inaugurated by Mallarmé (to some extent) and extended by waves of poetic practitioners like Charles Olson, Kenneth Patchen, Mary Solt, Kenneth Burke and Johanna Drucker (to name only a few).

4.4 SOFTWARE CASE-STUDY : Mudbox

> "… fixing the informational temperature at the minimum necessary to obtain the aesthetic achievement of each poem undertaken."
> Harold DeCampos. *The Informational Temperature of the Text*

When in 2009, I published *Human-Mind-Machine,* a video constructed from screen-captures of the manipulations of single words within *Mudbox* (a 3D animation software), I was not concerned with what DeCampos refers to as minimal means. Nor was I concerned (as Brian Kim Stefans is) with a refutation of the lyric[149]. The video-poems are minimal. And they might seem at some level to be computational poetry, i.e readable as data evoking a refutation of the lyric. There are possible however (opposite yet not incompatible) interpretations. First off, I am a novice user of *Mudbox*; the artefacts and effects generated are in many instances spontaneous accidents. Second, *Mudbox* permits rash reckless experimentation that provokes excess. Surplus is not inelegant when innocent. I was hoping to convey a classic concern with life as wound, scarification, egocentric inflation, and the rough transformations circumstance creates in consciousness. In short, 3D permitted an open situation, concerned with classic content, through which the lyric reincarnates as excess.

In addition, Mudbox (when hacked for innocent use as a screen-capture animation tool) has no timeline. It is not (as is *After Effects*) an authoring environment where precisely planned and tediously crafted elegance occurs. Instead, it is an area of swift experimental probes, excursions into spontaneous pressure – a playground for letterform deformation. Everything occurs in real-time. It is a riot not a ballet.

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[149]In 1982, Harold De Campos published *The Informational Temperature of the Text* in the summer issue of *Poetics Today* devoted to *Poetics of the Avant Garde*. In 2003, Brian Kim Stefans discusses this article in the context of the CP: *Computer Poem* (in *Fashionable Noise: On Digital Poetics*. Pg. 117-18). In both De Campos (concrete) and Stefans (computation) a refutation of the lyric occurs. For Stefans, the CP "does not aim to satisfy any of the Aristotelian poetic criteria –plot, mimesis, catharsis, etc…) … reading a CP invariably sinks into certain modes of data analysis" (Stefans. Pg 116-17).While De Campos concludes that a rigorous simplicity is "analytically and aesthetically, the character of a true *stylistic principle*. As such it is verifiable as a device…"(De Campos. Pg. 181).

4.4.1 A Very Brief History of Sculpting Software

Although the following case-study concerns the software Mudbox, Mudbox was not the first (nor is it the only) software to develop modelling tools that are sculptural in quality (it just happens to be the software I used, but the argument can be generalized to other softwares). Notable as precedent, ZBrush developed by Pixologic was demoed in 1999 at Siggraph, and then commercialized by 2002. Mudbox was first developed to produce the 2005 version of King Kong, purchased by Autodesk in 2008 and now ships in a suite with Maya (which has its own set of modelling capacities and was first released in 1998). As these tools develop they adopt ways of manipulating models derived from both arts and industry. In arts, sculptural methods provide the foundation for sets of brushes (more on brushes later); and in science, these softwares borrow industrial processes of replication and duplication, and architectural techniques derived from solid-modelling tools like AutoCad (released in 1982).

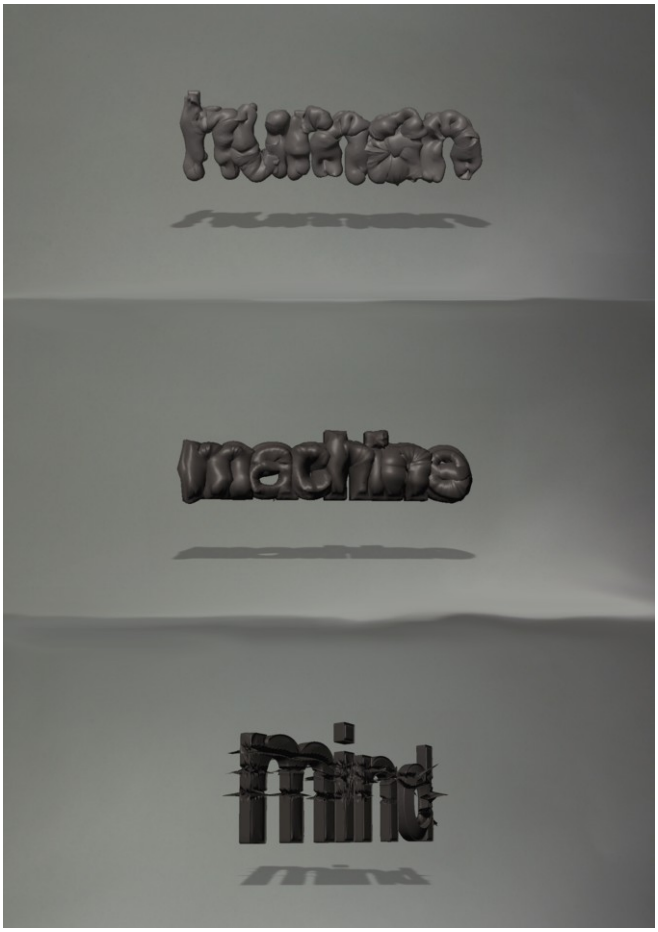

Figure 18: *Human-Machine-Mind* (2009). Stills from video by the author. Made with Mudbox. Post-processing: Vegas.

ZBrush and Mudbox, unlike AutoCad, model soft and fluid materials. It is for this reason, they signal a bridge in 3D authoring that moves from hard to malleable, dry to wet, linear to curved. They are also in many ways precursors of software that will render in real-time objects as they are modelled. Thus they fit metaphorically into the explosion

of biological sciences and bio-arts that now manipulate wet DNA. As (noted previously) there is a lineage between language arts and genetics that leads from holograms to bioculture (via Eduardo Kac).

4.4.2 As Usual a Disclaimer

My own experience as a 3D animator is limited to a year-long full-credit undergrad university course in Maya, a programming course in OpenGL, and extensive auto-didactic play ever since. In 2009, I was given (by NT2[150]) a one year student license to Autodesk Suite that included Mudbox. I know no one else in the Mudbox user community and suspect that they would consider my practice to be that of a misinformed Luddite[151]. In any case, I also suspect my innocence is an asset. Because I had no one to teach me how to use the tool properly, and I had some ingenuity concerning similar tools, I developed a very idiosyncratic (and limited) pipeline for manipulating letterforms. In other words, improper use arrived at a relatively unique method that says something about the tools as they exist now.

3D modelling reminds me of medieval craftsmanship. It is time-consuming, energy-intensive and more often goes wrong than right. General purpose tools like *Soft Image*, Blender or Maya, do not encourage amateur users. The learning curve is steep and the path begins with a cliff. Exploratory creativity[152] in these authoring environments exacts a heavy temporal entrance fee. Mastery is even more expensive. It is for this reason that these softwares are analogous to arts such as oil painting, etching or casting sculptures

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[150] NT2 (Nouvelles Technologies Nouvelles Textualités) http://nt2.uqam.ca/

[151]The communities of both ZBrush and Mudbox seem divided between what I call the *cutes*, the *commercials*, the *mystics*, and the *warriors*. *Cutes* build fluffy things. *Commercials* build ads. *Mystics* build legends. And *warriors* build war.

[152] As defined by Margaret Boden, *exploratory creativity* is the introduction of a new element into a conceptual state-space; exploratory (or improbablist) creativity is contrasted with impossibilist creativity which transforms the concept space. (Boden, M. *Creativity and Unpredictability.* SEHR, volume 4, issue 2: Constructions of the Mind. Accessed *o*nline at http://www.stanford.edu/group/SHR/4-2/text/boden.html*)*

in metal (that sometimes involved apprenticeships) and instruments like oboe or clarinet. Both physical skill and longterm dedicated practice are prerequisites for competence.

When I began muddling about in Mudbox, I knew that my own stylistic preference for spontaneity and sketch-work would have to find a methodological foundation. *Mudbox* was designed for quick intuitive clay-like sculpting of 3D characters, yet it has not yet been conceived of as an animation tool. So I derived a screen-grab method that effectively converted Mudbox into a crude animation tool. I knighted my idiosyncratic method: *Mudbox Machinima*. *Machinima* arose when game users began to produce short 3D movies using the capture tools inside console games and basically involves re-purposing a tool/game for a use not foreseen by its creators; it seemed an appropriate name for my ludic hijacking of Mudbox's capacities which effectively short-circuits the normal arduous rendering route of letterforms from Maya to Mudbox to Maya, avoids the creations of cameras and lights, does not involve complex raycasting, and within its constraints offers an opportunity for spontaneous quasi-improvisational play.

The process that I called *Mudbox Machinima* was a multi-software workaround. The process began by creating a simple letterform model in Maya; the model was then exported for use in Mudbox[153]. In Mudbox, the background was set to a classic blue-screen color and the grid hidden. A screen-capture tool (Camtasia) recorded a video of the sculpting (a step which is now in the 2011 version of Mudbox unnecessary since they have embedded a video rendering engine directly into the interface so that users can exchange interface tips using online videos). My goal (even then as now) was

[153]Detailed instructions for how to create a text model compatible with Mudbox are available on my website (http://glia.ca/conu/soundSeeker/wordpress/3D-Pipeline_Sound_Seeker.htm) , but are unnecessary as of 2011, since the new version of Maya and Mudbox contain new improved interoperability between Mudbox and Maya. Plus Mudbox now renders out directly to movies. I wrote an email to customer service asking them when this would be available. I also asked if it would be possible to totally hide the cursor which is not yet available. When they do introduce the *hide-the-cursor* capacity, it will introduce an explosion of malleable morph experimental videos.

different from the software designer's intended users, not to instruct or tutorialize, but to adapt, manipulate and composite improvisational deformations. The resulting exported video was imported into a video editing software (in my case: Sony Vegas) and a chroma key applied to remove the background. Shadow was created by duplicating the Mudbox-film layer, removing its color and contrast, rotating it in 3D, changing its opacity and applying a small amount of blur.

All in all a relatively simple process, but one that, in the intervening two years since I developed it, is already obsolete, superseded by multiple improvements in the interoperability of Maya and Mudbox and new video renders direct from the Mudbox interface. Nonetheless it demonstrates incipient signs of letterform life, the twitching skin of letters, a fast pipeline from conception to product, and the tendency of users to contort software for specific needs unanticipated by the designers.

4.4.3 The Mudbox Interface

> "Though we have spoken, indeed, metaphorically of the 'life' of the program, it is not only metaphor. Mind enters world, not contained within skin, but as a circuit-loop feedback operation[154]. The living, and all living functions, are indissoluble from information-driven environmental loops which alone serve as units of survival. Animal mind, protected from 'real' impact by the physical world, negotiates its circuits by abstract, non-physically locatable, information."
>
> Stephanie Strickland and Cynthia Lawson Jaramillo
> http://www.slippingglimpse.org/pocode

Mubox and ZBrush offer direct gestural deflections of three-dimensional surfaces in ways analogous to manipulation of matter; in this way they evade the keyframe tweening mindset inculcated by timeline production that temporally distances the artist from the normal immanence of cause-and-effect. To repeat, with timelines the artist performs a transformation, applies a keyframe and renders to watch. It is as she has to press a button in order to see change occur after touch. On the other hand, in Mudbox,

[154]Bateson, Gregory 1991, *A Sacred Unity: Further Steps to an Ecology of Mind* , ed. R. E. Donaldson, Harper Collins, New York, p. 165, 199-202, 261.

direct tactile control leverages ancient instincts that engage and respond to immediate visual feedback. There is no delay, no interrupt, no obstruction.

ZBrush first shipped in 2002 with 30 brushes. The palette has expanded since then. Some brushes relate directly to painting, others to sculpting, strokes, textures and materials. All are parameterized so that each brush actually represents a wide range of potential deflections. Mudbox uses a colloquial naming pattern for its brushes; the *sculpt* brushes are called: sculpt, smooth, grab, pinch, flatten, foamy, spray, repeat, imprint, wax, scrape, fill, knife, smear, bulge, amplify, free, mask, and erase. At a nominal level, these tools replicate normal easily-understandable ways of working with physical matter; at a cultural level, these tools merge the toolsets of sculptures and painters; at a physiological level, they function as prosthetics, enhancing the hand, extending the eye.

In terms of letterforms, software *brushes* echo typographic foundries which produced hot metal type which were poured into matrices. Ironically, matrices again hold the form of type in Mudbox, matrices of binary code; except that it is not lead that is poured hot into the moulds, but data.

4.4.4 What does Mud have to do with Language

To reiterate, malleable typography allows semantic deflections to occur on the skin of the letterform itself, in the texture of the text so to speak. Texture in 3D idiom refers to the skin of a model. If the skin of a letterform is a surface that can be scratched, scarred or twisted, then surface deflection becomes semiotic. The shapes of skins are also *read*.

Humans interpret and classify both costuming and contortions of bodies. Letterforms with bodies get read somewhere in between language and image. This oscillation merges literature with aesthetics. An expressive displacement that occurs at the level of vision reverberates into thought. It is a change that occurs in parallel with the changes in depth postulated by Wardrip-Fruin's reading of *expressive processes* and Sondheim's

emphasis on *codeworks*, where the programmatic foundations underlying mediated language become semiotic. Instead of a depth expansion, I am speaking of a breadth expansion, a semiotic infusion that occurs on the surface of letters.

Choreography carries expressive capacity. Anthropomorphic 3D container letterforms echo our own skins. Visual deformations activate a history of aesthetic analysis. As many before me have noted[155], textural deformations of letterforms expand reading. And like contemporary biological sciences, which are permitting new genetic manipulations to emerge[156], 3D modeling tools such as Mudbox and ZBrush permit a range of mutations that exceed the traditional range of typography (making it opaque and embodied), choreography (defying gravity, interpenetrating bodies), anthropomorphism (inflating, inverting, merging), and visual history (oscillating from perspectival to flat, animating the frame).

4.4.5 Shape Semantic Synergy, Motion-Tracking and Music Videos

As previously alluded to (in section: Ads as tech Ops), the expanded synergetic reading of literal as visual has been most cleverly and deftly exploited not by digital poets (who have contributed to the conceptual and aesthetic evolution), but by film credits, music videos and advertising. Ads have colonized the genre, rapaciously assimilating tropes. Motion graphics fused with 3D renders have become normative in both video and print media. Antoine Bardou-Jacquet's 2000 music video for Alex Gopher's *The Child* is a descendant of Jeffrey Shaw's prescient responsive installation 1988 *Legible City*. The music video for Justice's *DVNO* (directed by Machine Molle, So-Me and Yorgo Tloupas) displays song lyrics as animated logos from the 80s: 20thCentury Fox, HBO, NBC, PBS, CBS, Universal, Sega etc…Basically it samples a decade's worth of motion graphics and

[155] Drucker, Kac, Cayley, Raley, Kirschenbaum and others: see section on CAVE

[156]The first self-replicating synthetic life-form was created by Craig Ventur's team during the writing of this thesis.

compresses the experience into several minutes. It is possible technically because of direct feedback processes in modelling software, and scripts that bypass timelines in the compositing environments.

The effect of a video like *DVNO* engages because culture is suffused in typographic effects, this ad-for-a-band leverages inter-textuality: the comparative capacity of cognition derives pleasure from identifying subversive recycling of aesthetic tropes. The objects that are being composited, the fuel and content of the assimilation aesthetic, are 3D models, and often these are models of letters. The software involved in these animations increasingly involves the capacity to manipulate in real-time. In addition, there is one other way that contemporary practice escapes the timeline: algorithms. Generative control of control points and meshes constitutes the preliminary architecture of rudimentary metabolisms[157]. So the compositing occurs at the level of content (where old motifs re-emerge), software (modeling, rendering, compositing softwares used in sequence) and technical synergy (where models are merged with live footage, the hand merges with algorithm).

Augmenting this accelerated creative process, there are many proficient software point-trackers on the market: Shake, Fusion, Nuke, PFTrack, Bonjou, MatchMover and Mocha. They resolve and match 3D into video space. As stated earlier digital language will shift ontologically when *digital language adopts features of organic life and is perceived as natural and natured.* Point trackers perform the basic physics of orientation. These are algorithmically tractable tasks that were previously performed by hand pinning keyframes to timelines. The combination, therefore, of modelling tools where letterforms respond immediately to deflections of the hand, algorithms which auto-activate motion based on proximity or generative processes, and the ability to blend these letters into environments are steps on the path toward *living language*.

[157] For more explication of this escapes, see the following *Re-awakening the Inert* section's discussion of the MandelBulb-generated *Easy Font* where timelines become subsidiaries of the algorithm which performs the majority of the work. Sculpting becomes an aspect of parametric tweaking.

4.4.6 What do Ads have to do with Poetry again?

ads that are also language art
bifurcate between meanings,
careen between disciplines; and
bypassing discourse,
render& sell
Jhave. Blog post[158]. Jan. 4th 2011.

My tastes and interests are obviously more sensual (some might say naïve) than the dominant vector of conceptual language-art criticism which emphasizes a lineage including Kosuth, Weiner, Baldessari, etc. … whose visual styles, incidentally, have not modulated radically in reaction to digital technology. It's surprising to me how few digital poets actually work with 3D or motion graphics. If anything there has been a backlash against it. Poets of a previous generation worked with 3D: Eduardo Kac, André Vallas, Ladislao Pablo Györi, and –one could include—Muriel Cooper. They often came from a hybrid or visual art background. Perhaps due to the stigma of 3D ads colonization (i.e. contamination) of the genre, poets have rejected it. Perhaps it's due to the *learning cliff*. Perhaps it's McLuhan the prophet admonishing them at the gates: *the medium is the massage*. Perhaps it's simply an abhorrence of effect for effects sake. Anyway, poet-practitioners dedicated to 3D art are rare. It's a rarity that might cease in the next generation. It is this potential that motivates.

Figure 20: *Per-servere Per-ish* Ad. circa 2007? Product

Take a very simple ad found

[158]http://glia.ca/meanderings-wordpress/concrete/chafic-haddad.html

online[159] (see figure *Per-servere Per-ish*). It is apparently a product of the marketing agency JWT executive creative director Chafic Haddad[160] but it is also to my mind a key work that demonstrates how the minimal means of concrete poetry can be utilized effectively with 3D modelling. Maybe it is a still from an animation (the –SH slowly toppling). Imagine Marcel Duchamp finding this ad and submitting it as his artwork for a language show. The level at which the play of language in *Per-servere Per-ish* sends semantic meanings in recursive circles exceeds that of a simple branding exercise. Form follows content (a little too obediently but nonetheless symmetrically), the medium is integral to the piece and its execution is stylistically (as in much lavishly budgeted branding) impeccable.

4.4.7 Re-awakening the Inert

> "….virtual 3D structures made from letter forms will have, as it were, an appreciably enhanced spatial structure for literate readers. Moreover, because of the expectations (of legibility) that these forms bear, it should be possible to "play" – affectively, viscerally – with their form and arrangement in ways that are likely to have aesthetic significance, and some bearing – potentially, ultimately – on literary practice."
>
> John Cayley. 2006. Interview with Rita Raley[161].

Origin myths often begin with a lump of clay or mud into which the spark or breath of

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[159]And now cannot refind: if you see it, please send me an URL.

[160]Ad pedigrees are as convoluted as trying to figure out who silk-screened Warhols or constructed a Koons. Production companies and mega-artists distribute the work and cunningly constrain the brand to a single name.

[161]Special edition of Iowa Review. Editor Rita Raley. http://iowareview.uiowa.edu/TIRW/TIRW_Archive/september06/cayley/cayley.html#note1Cayley also anticipates my own Mudbox work and the core of this thesis by stating:""…historically, the spatiality of (written) text has been constrained to two dimensions and to conceptually 3rd-dimensionless planes (signs, inscribed surfaces) in the space that we inhabit. To place atomized text in space, for whatever purpose, including the aesthetic, is a novelty of uncertain significance and possibly so strange as to be senseless."

life enters. The inert mud awakens. The sufi-poet Rumi is occasionally cited in evolutionary literature because he identified a chain of incarnations from mineral, vegetable, animal, human, and so on; the path of life spark through matter. This vision of a gradient of sentience is shared by many western panpsychists. Life begins with chemical constituents and arrives through structural emergence at self-consciousness. The core matter of the non-living and living are not different: these are carbon-based forms. From the perspective of both myth and biochemistry, mud is at the root of reason, passion, credit card charges and world wars.

Figure 20 : *Easy Font*. (2011). Mandelbulb-derived font created by author with assistance of Etienne Fortin at Sagamie. http://glia.ca/2011/easy/

Currently tools like ZBrush and Mudbox offer a reasonable visual simulation of physical contact with digital representation that seems a lot like wet clay or mud. It is not of course wet or gritty or chemically coherent in ways that emulate the complex capacities of matter, but it can, within the confines of a screen, emulate the physics of these substances. And screens in spite of their evident ocular-centric limitations do effectively activate empathic processes. If screens did not function empathically, action

films would be boring and porn would not be a major industry. Modelling software is already one step farther than most 'films', it is interactive. So additional physiognomic reflexes and endogenous networks of biochemistry arise during the authoring-modeling process of mouse and Wacom gestures; the software user is physically implicated in a process that is mythological, they are reconfiguring matter into emulations of life.

One step beyond modeling is generating. Growing generative forms automates the sculptural instinct. Scripting languages specific to many 3D vendors encourage exploration of generative forms. How are they grown? They are written. They are often recursive. They manipulate geometries in topological ways. This trio of attributes (written, recursive, topology) palpably echoes the linguistic theories of language itself, and resonates with thoughts previously cited from Strickland, Thom and Bateson.

Code pervades the process, human agency and intervention reduces to an aesthetic nurturance role. Creating works in such a way is analogous to gardening. Future fonts may be grown (as anticipated to some degree by J. Abbott Miller). Donald Knuth's quest for the essence of all fonts may not be answered, but the seeds he sowed by initiating the first sustained computational attention to font formats as programmed entities will flourish. One potential pathway such fonts might take is explored in my 2011 *Easy Font* project (see figure: *Easy Font*). All the component pieces of the *Easy Font* letters are algorithmically produced using a commercially available MandelBulb ray tracing 3D plug-in produced by the ex-physicist Tom Beddard[162]. A real-time version of the plugin is currently under development; it will apparently run in the browser. So it is not speculative sci-fi to anticipate fonts which organically occupy space. It is not fantasy to anticipate the poets who will culture and grow from seed algorithms morphing letterforms and compositional structures. Poets will examine these creations with the same proud sense of authorship as previous generations have harvested their subconscious for rampant sensual scribblings.

[162]Mandelbulb plug-in page: http://www.subblue.com/projects/mandelbulb

4.4.8 Working in Mudbox

One of the underlying suppositions of this thesis is that the methodologies of working in 3D environments are getting easier[163]. From that ease, 3D text might become optional at a popular level, in ways analogous to the spread of literacy, a generation who have grown immersed in CGI and 3D, familiar with the paradigms of rendering, naturally absorbing new affordances will utilize text in ways that will make our current practice anachronistic. The story of my own experience with Mudbox confirms this tendency. When I began working with Mudbox and Maya in late 2008, the interoperability pipeline between these two softwares, vended by the same company as part of a suite, was far from stable. Complex intersecting sets of parameters had to be meticulously compatible in order for the transfers of typographic models to occur without errors. This occurred in both directions. The only way to play with text in Mudbox was to first model it in Maya, enable the obj export plug-in, carefully calibrate the bevels and send an .obj file to disc. Only after opening the .obj file in Mudbox would errors appear. These would be visual deformations (destroyed kerning, inverted corners, smooth meshes that looked like cactus). Inside Mudbox, there was no error list or suggestions on what had gone wrong. Getting text to export correctly, in a way that was satisfactory to my aesthetic goals, took me about 1 and a half days of steady back and forth effort: a blind process of trial and error. The overall feeling was of being submitted to a border crossing where rigid unwritten rules controlled my fate.

As of 2011, the current versions of Maya and Mudbox contain export functions specifically for each other[164]. This functionality is the equivalent of a highway compared

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[163] This supposition may seem to contradict what I said earlier about a *learning cliff*, the steep path of mastery. But parallel to the complexificaion of the artisanal craft of 3D modeling, there is an inverse process underway that is documented to the point of being a platitude: Moore's law. The population of the world's innovators increasing yearly and a generation of digital natives are busy trying to make names for themselves as software developers. In this high octane obsolescence entropy, many baseline activities are becoming radically easier.

[164] Yet as of my preliminary testing in early March 2011, the in-built "Send to Maya" functionality is buggy.

to the previous dirt road[165].Mudbox2011 (as I stated before) also contains a render to video function that auto compresses to various formats. Both of these amendments alter the relationship the creator has with materials.

4.4.9 The Impoverished Hand Fed by the Empathic Head: Sculpting 5.0

> "We cannot be sure whether Leibniz was right to compare the perceptions of a rock to those of a very dizzy human, or whether we should speak of 'experience' at all in the inanimate realm…However I would propose that if we look closely at intentionality, the key to it lies not is some special human *cogito* marked by lucid representational awareness. Instead, what is most striking about intentionality is the object-giving encounter. In other words, human awareness stands amidst a swarm of concrete sensual realities."
>
> Graham Harman. *Towards Speculative Realism.*(132)

Traditional sculptors relate to their materials like feral cats: they prowl, absorbing them. A block of granite or wood provides flocks of subconscious cues: grain, temperature, rivers of colour, deformations, flaws, weight, etc… An old coat hanger may suggest a crucifix; a skull may need to be encrusted with diamonds. Many of the cues are multimodal. Fingers, eyes, nose, ears and the proprioceptive body each contribute. Michelangelo reputedly claimed that he was freeing figures within stone. Figurative

---

I tried to export to Maya without any success on my machine. Found a few forum posts of users with same problem. No solution noted. And exporting a simple geometric primitive (a sphere) to Mudbox failed as well. An fbx file was created, Mudbox opened it, but there was nothing visible and no object in the object list. I also tried simply saving a file from Mudbox and opening it in Maya, but that too failed. One blog suggested this bug was due to Maya's propensity for checking the entire mesh for errors. Either way, it did not work. So perhaps there is a problem with the module in 64-bit mode, perhaps it is an alpha feature embedded into a release that arrived before it was sufficiently tested. Either way, the much-needed and much-vaunted interoperability of Maya-Mudbox is not yet a highway, it's more like a coyote path.

Added note: there is also the MudWalker plug-in developed by Wayne Robertson in 2010.

[165]The metaphor of communication between softwares and interoperable file-transfer as roads echoes the seminal work of Harold Innis into the role of transportation in Rome. It also suggests that maybe this change is not necessarily unequivocally progress. Struggling intimately with recalcitrant procedures to make them do things for which they are not specifically designed is like the pleasure of a farmer. Pressing a button to make it happen is a bit like using a swipe card to get into a parking lot: convenient but crowded.

expressivity is not alone in this absorptive approach. Other cues are social: what use has this object had? What context does it arise from? How has it never been seen before? Duchamp's sophisticated grasp of the contours of conformity and stigma gave him the capacity to challenge and transform contemporary art. Krauss's conception of extended field heralded the anti-monumental movement. In each case (traditional, modern and post-modern), the sculptor's relation to materials contributes to creation. How does this work when the materials are screen-based and software-derived? Is it possible to relate creatively to the materiality of computation? No current category of conventional arts can accurately describe thick words gouged and spinning, plump words fluffing up into indecipherable froth, and letterforms carved like moist icing.

Inside Mudbox's default layout, there is a tabbed rack of tools at the bottom. These are prosthetic fingers: rigid, clawed, and magnetic. Kneading digital substance occurs by flicking between these tools (a flicking which in Mudbox 2011 is accomplished with the numerical keypad). Altering brush parameters permits customizable deflections. Wacom tablets are the preferred input device. Pressure-sensitivity delivers simulacra of sensation. The surface can be worked at various levels of resolution from rough (low poly-res) up through levels of increasing density. These levels co-exist superimposed virtually as abstract entities, the sculptor flicks between them (using page-up/page-down). Traditional advice floats around the public forums about how the sculpture must be roughed in at low-res and then progressively *worked* layer by layer. It is the same advice as that given to apprentice sculptors in the renaissance.

Just as one would with a real chunk of clay, the 3D modeller turns the model, prods at it, zooms in (steps toward) and scuffs or scratches, zooms out (steps back), rotates (the pedestal), corrects a detail, rotates again. It happens at the same speed (if not quicker) as it would physically. Clearly the paradigm of tactile precision has made a cursory conversion into computation. Ancient and contemporary crafts (and I use the word with respect) are iterative processes, repetitive toil. After the instigating idea, creation devolves into a steady process of approaching the implementation of that idea (while

sporadic spikes of ancillary inspiration occur, most of the work is attention to detail). Luckily monotony of labour if accompanied by a need for concentration sometimes pleases the body; to hit the chisel with a hammer, to move a chess piece, to click over and over on a Wacom tablet all belong to a similar continuum. Hours are measured in tiny modulations as the work creeps towards completion. I see little difference between computational modeling and physical modeling: same instinct, new tools.

In my view, the tactical impoverishment, so often seen as symptomatic of contemporary screen culture, is empathically bridged by the brain[166]. Sculpting in software is sculpting. Brains already do live happily in jars; the jars are called the skull.

4.4.10 How does this relate to Timelines?

I want to emphasize that the workflow-workaround I developed had one ancillary effect: rendering (instead of being timeline-based) became spontaneous real-time improvisation. Instead of re-importing the model into Maya, creating cameras and lights, applying a texture, and animating the mesh of the letterform by setting keyframes on a timeline, the rendering was extracted directly from the screen in Mudbox in a single improvised take. Instead of calculating each position as a step and allowing the software to interpolate between them during the final output, gesture was immediately transcribed. This process suggests that there is a role for non-timeline-based animation work during the spontaneous manipulation of an object (regardless of whether it is a letterform or anything else).

4.4.11 Instrumentality

Software that permits real-time auto-recording of parameter changes already exists in the audio realm. The Ableton Suite interface is divided into clip and session modes

[166]V.S. Ramachandran's research into the capacity for phantom limb patients to amputate their amputated arm is just one example among many of potent mirror neuron, affect-rich empathic systems of human cognition.

which allow users to manipulate multiple parameters while playing. These manipulations automatically enter into a keyframed timeline. Parallel ways of working (improvisational and cell/frame-based) interweave. Subsequent runs of the same timeline can occur with changes to any of the parameters made during the run or after it is over. Spontaneity and rigor are equally enabled. Fine-grained modulations can be done by hand over tiny regions.

This integration of parallel capacities that encompass improvisation and iteration creates flexible software *instrumentality*. The software can be played like an instrument (free improvisation) even as it records (classical inscription). The instrument analogy at one level explains why audio software has incorporated such capacities while 3D has only tentatively explored it: musicians have for millennia been using a combination of improvisation (free play) and timelines (scored music). Sculptors have not in general worked with a single tool as musicians generally do. At another level, the added GPU and CPU intensive processes entailed by 3D preclude such a free approach. Real-time rendering at high frame rates with complex polygon counts is not yet occurring on commercial level PCs.

4.4.12 The Role of 3D in Future Writing

"Language is both acoustic and optic..." Alfred Kallir

I have repeatedly stated that the shape of the body's internal resonators when speaking might be the source of shape-sound associations that operate as archetypes. And that these shapes (basically sculptural forms congruent with morphemes) have (until digital 3D) lacked the technological means to become integrated in a volumetric way with letterforms. It is my contention that tools like Mudbox (and other 3D sculpting tools such as ZBrush, Cinema 4D etc..) will permit these associations to become manifest.

Unfortunately, there are few *credible* sources for this claim. Alfred Kallir's *Sign and*

Design: The Psychogenetic Origins of the Alphabet, while astoundingly rich in etymological fauna[167], is an outlier. It claims that the alphabet emerged from painting, all languages (even remote ones) emerged from a communal source, and that modern alphabets contain the sediment of deeply-rooted atavistic sexual and psychological pictorial impulses. I am inclined to believe there is much that is true in Kallir's basic ideas; the details may occasionally spurt into fiction, but the core is tenable. The letter *A* for instance flipped vertical is a horned animal, a priapic hunter man. *B* is an abode, a dwelling, a feminine womb. *L* carries liquid within it. These optic-semantic roots (what Kallir refers to as *symballic*: concurrences of semantic sediment carried by form) carry over into contemporary language as the allusions and ricochets of congealed meaning that make words more than literal. Letters are in this sense monuments weathered by use.

As alluded to in chapter 3 on aesthetic animism, the evolution of printed text can be seen as progressive abstraction enabled by technology. To be literate is to read abstract symbols. Indo-European printed letters are not consciously ideogrammatic, nor are they doodles. Their meaning bears little relevance to their visual sense (even if we accept Kallir's claims, the resonance of visual archetypes is a residue). It seems likely that we are schooled to learn them, not born into them. There is not yet (as far as I know) a genetic marker that predisposes one to learn QWERTY keyboards. It is a skill, absorbed over time, an epigenetic feature. Letterpress involves an apprenticeship. The same holds true for 3D animation studios. Modellers absorb traditions, expand, extrapolate, evolve and innovate. However I will be curious to see if once 3D tools are absorbed and widely distributed into daily usage, will their products iteratively converge toward forms that fit with the inherent shape-sound associations?

In this postulated future, letterforms evolve meanings that correspond to archetypes of how they appear. A liquid word might use a liquid font. Or adversely, a dry cement-block

[167] It cites from a diverse radiant array of languages: ....

font might spell out the word 'fluid' and shatter into dust. In this way, poetry, specifically visual poetry, by engaging with the materiality of letterforms as entities will advance the evolution of letterforms so that the form and animation of the letters constitutes a primary vector for interpretive analysis. Volumetric animated typography in this scenario re- or de-volves on a spiral to parallel the reputed origins of language: painting and sculpture, the moulding of forms, wet clay, raw touch. As such tactile language becomes a precursor to an eternal return, bonding language once again to representations that (although screenic) are in this world, of it, as its.

4.5 SOFTWARE CASE-STUDY : Mr Softie

> "A sequencer might play itself for some time after being given instructions, but a guitar demands interaction for each note sounded."
> Noah Wardrip Fruin. *Expressive Processing*. Pg. 371

Mr. Softie[168] is typographic software that allows touch-sensitive user-manipulation of vector-based type. It allows flexible effects to be applied to text in real-time. There is no timeline. The implications of this interface change are subtle yet profound. It both aids and impedes the capacity of creativity in ways that have resonant implications for writing in the 21st century. It suggests word processors that operate as instruments sensitive to the gestures of their users.

Mr Softie ties into the presuppositions underlying this essay. Namely: visual digital poetry is innately sculptural; the formal issues it explores are structures: layout, placement, motion (or implied motion), and shape. Structures can be visual, linguistic, or emotive. Shapes bear the expressive weight of events that preceded them. In the same way that words gather emotive force (magnetizing semantic turbulence around them and evolving over time), shapes carry esoteric dimensions which have history, record time. Serenity, pain, sexuality, and anguish (while subjective and culturally-

[168] *Mr Softie* (2005-) has been created at Concordia University by Jason Lewis and Bruno Nadeau.

specific) have associated shapes; they writhe or remain still. Subconscious forms are collective. Sculptures bear witness to the capacity of humans to read form; totems are literary devices designed to express myth. Archetypal forms conjoined with language synergistically couple literature and sculpture.

What Mr Softie allows is the real-time capacity to modulate archetypal typographic shapes and capture those sculptural modifications as time-based media. As I have used it in my art practice, it has become a vehicle for hybrid creativity that spans and fuses disciplines. Processes of writing and sculptural concerns merge. It is this confluence of activities that (sometimes) permits conscious activity to be at the same time intuitive and direct.

4.5.1 Mr Softie History

Mr Softie builds on a foundation that originated when Lewis[169]and Weyers (1999) published *ActiveText: An Architecture for Creating Dynamic and Interactive Texts*. Developed at *Interval Research* in the heyday of bubble-boom euphoria, *ActiveText* included a centre-triggered mouse-menu system with menus available directly from the mouse position[170]. Sets of behaviours could be applied to sentences, words or glyphs. In 1998 when the *It's Alive!* software was created, Flash was at version 3, had been introduced in 1996, had no sets of presets, and required extensive coding in order to produce similar effects. Timelines for animation had been incorporated into Flash's precursor *Smart Sketch* (1995). The primary mode of animation was simple keyframing; the paradigm was (and continues to be) adopted from traditional cel-animation.

It's Alive! and *Text Nozzle* challenged a few design paradigms: it promoted context-

[169] Disclosure Note: Jason Lewis is an extra (yet fundamental) advisor on this thesis committee.

[170]A contemporary software that continues to use this paradigm is vvvv. Strangely, the vast majority of all the softwares now built utilize instead a standard file drop down menu system. Interface diversity has dwindled.

menus to a central role and did not use timelines based on cel animation. In most contemporary software, the use of context menus is used for basic tasks. *It'sAlive!* placed tasks at the position of the observer; all tasks were within range. Design changes can induce changes in emotional approach to authoring environments thus creating changes in creative practice. At a very rough level of granularity, *It's Alive!* emphasized the immediate and spontaneous. Text was accessed through a hierarchy of block-word-glyph by simple repetitive clicking (this feature allows quick cluster chunking without drag and draw style selecting); text was sprayed; text could be assigned parametric behaviours with 2 clicks. Some of these features have been carried over into Mr Softie.

I began using Mr Softie as a source for compositing footage by setting the background colour to a key-tone (green) and using commercial screen capture software to grab output. Interacting with Mr Softie test is sculptural and tactile. It requires practise. It rewards investment in the tool in ways that are analogous to traditional musical instruments and choreography where gestural prowess and sensitivity combine to yield polished results. The type can be assigned effects which correspond to emulations of different substances (clay, cloth, pulse). The user touches the type to produce changes in the form. These changes become aesthetic events that are occasionally charged with emotive and intellectual importance because they are precipitated by sensitive gradients in touch and emulate the subtle play involved in ancient embodied activities (sculpture, hunting, etc...).

4.5.2 Creative Practice in Mr Softie

Opening Mr Softie can be as delightful as lifting the lid of a piano. There is no necessity to really have a plan in mind. (By contrast, I can't imagine beginning a coding project without first have some vague idea of what I wanted to do.) This primary open pleasure is one of the key features of instrument-like interfaces: the potential available to a naïve intuitive practitioner is considerable. The ancient rituals of doodling or doing practice scales, or just fiddling about with a material are palpably present.

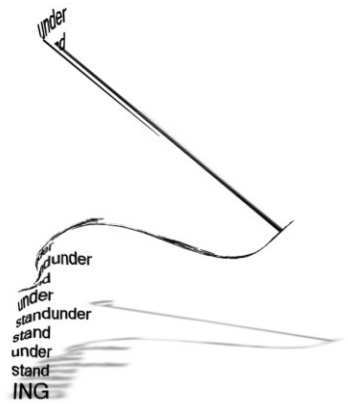

Figure 21 : *StandUnder.* (2009) Still from an animation by the author. Created with Mr Softie in real-time. Post-processed (adding shadow and soundtrack) in Vegas. http://glia.ca/conu/SOFTIES/

Some poets write from inside themselves, others write as conduits of a vast outside. In each case, what is needed is a way of transcribing the poem that does not get in the way, which allows the poem to be remembered in its immediateness, directly. Pen, paper and notebook have traditionally served poets well. For visual poets the problem is more complicated. Visual poetry often leverages effects that emerge concurrently with writing technologies: concrete poets (like Ian Hamilton Finlay, bp Nichol, Steve McCaffery, Judith Copithorne, dom sylvester houedard, Bill Bissett etc…[171]) developed styles that were only possible on typewriters; Johanna Drucker explored effects specific to custom typesetting; for a while in the early 90s I made a lot of work with old letraset packages (as does Derek Beaulieu now, who seems to have augmented the process with Photoshop). In short, technologies invoke change. As visual poetry migrates onto digital platforms, the adaptive opportunistic trend continues: visual poems often exploit signature potentials specific to their authoring software; as such, it is the software itself that defines how visual poetry is created and appears.

[171] Visual poetry (edited by Derek Beaulieu) http://ubu.com/vp/index.html

The extent of the perceived aliveness of the text is a by-product of how much the authoring environment encourages manipulations independently of quantified time. Timelines in my mind replicate the scientific model of recreating life: they enable compartmentalized and measurable parameters to be manipulated rigorously. The non-timeline free-form sculpting environment is more related to musical improvisation: it relies on gestural fluidity, instinct and immediacy. When the two modalities (linear granular and fluid improv) converge (as is increasingly occurring in contemporary software packages), then typography accesses synergetic strength.

4.5.3 StandUnder: a specific case-study of Mr Softie Use

StandUnder (2009) is an animated-typographic poem I created with the *Mr Softie* software. Without the real-time manipulation capabilities of *Mr Softie* (enabling an agile, tactile and exploratory creative process) *StandUnder* might never have been created. In the same way that the typewriter and custom type-setting provide signature motifs, *Mr Softie* offers a unique set of potentials that influence the digital poetry created with it. In the following, I interweave the story of how *StandUnder* was created with reflections on the symbiosis of software design and creative process.

In mid-2009, inside the *Mr Softie* authoring environment, I began idly stacking words, without thinking very much, until I had created a tower out of one word repeated over and over: *understand*. Then since each word was standing *under* another, I (mischievously, out of boredom) changed all the words to *StandUnder*, introduced a few line breaks, so it read:

….
standunder
stand
under
stand
ING

Note: there were more words repeated than what I have reproduced here. I still had no

idea really what I was doing or aiming toward[172]. At this point, *StandUnder* was already a reasonably intriguing concrete or Lettrist style poem[173]. Although viewed through the jaded eyes of multimedia-saturated consciousness, its appeal was conceptual rather than sensual.

In static form, the interplay of semantic and visual structure in the static work generated knots of fertile ambiguity: is *standing-under* the opposite/extension of *under-standing* something?[174] Are there physical relationships implicit in comprehension? Is humility coincident with receptivity? Is knowledge hierarchical and power-inflected at social, political and personal levels? Are facts cascading down from iconic sources like viral memes released from a tower of conformity?

With these epistemological and literary questions in the back of my mind, I began to apply effects to the tower of words. Since the cascading steep dense stack of words resembled a cliff, and the questions it evoked made me think of knowledge as a cascade of pressure dynamics, I was led to apply what had become (for me) a standard set of drift effects[175], with different strengths and radius of brushes mapped to the three (left-

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[172]I think this fact (confession of ignorance?) needs emphasis since it speaks honestly to the way art (and perhaps science and the humanities) often involves establishing a field of encounter, a set of relations which desultory or ecstatic consciousness reflects and plays with ideas until arriving at an unanticipated destination. Science and the humanities) often involves establishing a field of encounter, a set of relations which desultory or ecstatic consciousness reflects and plays with ideas until arriving at an unanticipated destination.

[173]If this had been the 1960s I might have made a set of mimeographs and mailed them off to poet-friends.

[174]Coincidentally, a blog post on Dec. 16, 2010 by Sott McKay (a man I attended University of Toronto with 25 years ago) pointed out that in Northrop Frye's *The Great Code* a passage concerns exactly this etymological transform of the word understand. Since I did take an undergrad course with Frye (one of his last as lecturer) it is highly possibly that the genesis of this *StandUnder* is due to the seeds he planted over two decades ago. Scott's post is at http://www.scottmckay.ca/the-blog/2010/12/16/understanding-the-substance-of-this-post.html

[175]This article makes no claims to offering a comprehensive overview of the features available in Mr Softie. It is an idiosyncratic perspective on a singular process which highlights the enabling motifs I adopted in the design of a single specific work.

middle-right) mouse buttons. These effects are not immediately active; they are now latent material properties of the text. They are physical potentialities that define how it will respond to touch. Once active, the text will distort as if flexible and sinuous. But at this point, nothing in the visual form of the text-tower changes; only the structure is now capable of changing dynamically.

This process took a few minutes. It is now 10-15 minutes after I opened the software and began perusing around. I have built a static visual poem and applied sets of effects to the mouse which will operate as a variable-pressure brush. I change the background colour of the canvas to green so that I can composite the animation later. I am ready to press the play button. What is static will now move.

4.5.4 Parameters and Palpability

In the Mr Softie environment, using the drift effect, mouse pressure parametrically deflects the form of letters as if the cursor were a finger pressing into wet mud. The various parameters available for user-manipulation (when using drift) are: effect radius, mouse strength, mouse falloff, origin strength, and friction. The user also chooses whether the effect is *always on* or which mouse button will trigger it. *Effect radius* defines how large the drift brush is. *Mouse strength* simulates pressure. *Mouse falloff* sets a gradient into the brush radius. *Origin strength* defines how intensely the text tries to return to normal (higher values glue the text to its original shape). *Friction* defines how much resistance there is to the pressure of the mouse. These parameters can be changed for each instance of the effect.

In the case of *StandUnder, I* assigned three different *drift* effects to the complete text block; each drift is independent and activated from a different mouse button. Each is of a different strength, radius and falloff. I have also assigned an *originate* effect which independently of the drift actions ensures that the text will elastically try to return to its (origin) normal shape no matter how it is deformed. At this point the static text is like a primed organism, but the animating force of the mouse effects or the originate effect

are not active until after play is pressed.

So here is the tension before beginning: I don't really know how the animation will behave. I have, like anyone who uses an instrument and has some degree of experience with it (embodied skill), tuned the Mr Softie instrument (by applying set of effects with parameters that I have used before). I feel confident that I can expect some sort of deflections to occur, but I am in a mild state of anticipation, since exactly what occurs next is unknown. Algorithmic events of sufficient complexity engender ambiguity. The smallest changes in pressure or gesture or parameters can intersect in chaotic non-linear ways. As with a dance or musical performance, it is rarely exactly the same twice. Playing in this sense is genuinely playing, it is an open activity.

Figure 22 : *StandUnder.* (2009) Still from an animation by the author. Created with Mr Softie in real-time. Post-processed (adding shadow and soundtrack) in Vegas. http://glia.ca/conu/SOFTIES/

I press the play button. The effects are activated, but nothing happens until I bring the mouse over the text and then press one of the mouse buttons. Immediately, the tower of text sheers sinuously away from my touch as if driven by a wind. I release the mouse.

The text relaxes, retracting along fluid lines back into its original position. Wobbling slightly, the tower of text resembles a shimmering ribbon of substance, jello ink. At a computational level, it behaves as a responsive fluid-cloth simulation. Consider it from a choreographic perspective. To get a particular shape, a choreographer might approach a dancer, lift the arm, turn the elbow, and place the shoulder. Like a puppeteer manipulating a marionette the constituent pieces are put into place; while the choreographer works, the dancer freezes and holds the form. If in Mr Softie I had not set the originate effect and had set the origin strength of the drifts to zero, then the text would have responded like a pliable material that could be bent and remain in shape: coat hanger style. With originate set, responsiveness occurs until the mouse is released, then the system flows back toward its source. Like the motion of a dancer who has been instructed to try to return to an original pose, the *StandUnder* tower-text in Mr Softie (with the *orginate* effect on) is relentlessly flowing back toward its original base shape.

Obviously, working with text in Mr Softie is also sculptural. A traditional sculptor spins or walks around a piece, changing viewing angles, oscillating between a position of proximity and a position of distance: nicking, cutting, nudging, melding. Similarly in most contemporary softwares (including Mr Softie, Mudbox, and After Effects) variable views are available: close-ups (zooms) and distance shots. The organic physicality of proximity and intimacy allows for fine-grained and general control. The writer models textual form. As in sculpting, in Mr Softie, pliable form yields to touch in ways evocative of malleable matter.

The moment I press play in Mr Softie is when these metaphors (choreographer-sculptor-musician) extend into motion, time-based work begins. The dancer is on the move, the choreographer yells instructions; and the speed, posture, form and structure of the dancer change responsively adapting to the instructions. The potter's wheel spins and clay drenched in water dives under a gouging thumb. A musician bends a string and sound bends with it. In these real-world scenarios, it's the pressure applied sonically or physically which alters the performative matter of the dancer or musical instrument or

clay. In Mr Softie, it's the assignment of diverse effects to different key stroke or mouse combinations (left-centre-right up-down) that allow gesture to modulate the form of pixels.

When the effects are set and balanced and the animation begins playing, the cursor roams over the surface of the type like a sheep dog racing from side to side behind a small herd, catching the pixels, directing the flow of the polygons. When it is working well, when the user-author is playing the text well, manipulating it with dexterity, not pushing it beyond control (unless intentionally), the process is intuitive and simple, the motion responsive, control immediate. The motion of text in such circumstances becomes as emotive and resonant with meaning as dance.

Figure 24 : *StandUnder.* (2009) Still from an animation by the author. Created with Mr Softie in real-time. Post-processed (adding shadow and soundtrack) in Vegas. http://glia.ca/conu/SOFTIES/

Rehearsing or practising is how I think of the repetitive process of trying out gestural play in *Mr Softie*: play, stop, reset, and repeat. Working on the *StandUnder* piece, I rehearsed several times how much pressure the text could tolerate before its fluidity shattered. This iterative process provokes muscle memory of sequence of effects and often generates visual possibilities that cannot be anticipated, emergent moments (as

happens often in theatrical rehearsals where repetition functions as improvisation). This time, it was possible to segment off and stretch out a neck of text, then to bend and fold the remaining text over the crushed lower level. In my mind, this created a sense of a downward weight, inexorable pressure, a visual analogy of performance anxiety provoked by a knowledge hierarchy.

4.5.5 Synthesis of Interaction and Instinct

The preceding comparisons to traditional media (choreography-sculpting-music) reflect my belief that an engagement with creative process in digital media emerges when gestural interaction converges with evolutionary instincts. Gaming FPS are the preeminent examples of how ancient hunting reflexes reinvest themselves in technology: find-aim-fire. Musical instruments constitute yet another model: pluck-caress-strum. *Mr Softie* activates the same instincts as moulding clay or playing with water. In instrumentalized non-timeline authoring environments, -- of which Mr Softie is one --, nothing can be *exactly* repeated or replayed as in a conventional timeline environment. The ephemeral nature of the practice combined with the fluidity of the typographic styles changes every time. As Heraclitus reputedly said, *you cannot step into the same river twice.* This alters the relation between poet and typography. Control and flow enter into dialog. Typography becomes categorically like sound or sculpture, responsive, pressure-sensitive, sticky, slippery, loud and delicate.

Mr Softie induces the writer into the role of a sculptor-choreographer. It does this in a way that enables the flow of creativity, permitting direct reactivity to occur between hand, gesture and distortions in the materiality of language. It is an open situation (much like play) where the enjoyment arises from unexpected serendipity, unanticipated reactions, and reactive motion. Tactile deflection is primary to understanding *Mr Softie*. Direct pressure-based real-time malleability gives the sense of working with flexible material; the material in this case is language. The physical sense of our normal exterior world are preserved or at the least emulated: pressure changes surfaces. In Mr Softie, touch deflects and pulls text into ribbons. It is as if clay or plastic

or licorice is placed under the hand. In spite of its mediated status, the type's direct reactivity makes it feel like a lived situation, the materiality of the text becomes tangible.

The *Mr Softie* authoring environment is both a sculptural tool and instrument for spontaneous intuitive visual digital poetry creation. During the creative process, the direct-feedback design of the software contributes to the outcome; and the experience of creating the animation becomes a process of enchantment, a poetic process where the innate animistic roots of poetic process flourish. *StandUnder* finished as the submerged knot of the tower stood up, unravelling its resistance to the pressure I'd placed upon it, all I had to do was stand back and let the software do the work.

This elastic embodied materiality of resilience programmed into the typography itself meant that the final version (output in movie form) is the record of a live performance: a play between gestures, physics, poet, language and programming.

CHAPTER 5: **CONCLUSIONS**

> "In all poetry words are a presence
> before they are a means of communication."
> John Berger. *And our faces, my heart, brief as photos* (22)

Inscription technology (how we write) has from time immemorial induced changes in what language is and how it is perceived[176]. As the rate of change of digital inscription increases, we can expect commensurate changes in how language is perceived, what it is internally as structure, and what it is externally as presence.

Tavs are structurally distinct from any other letterforms or literature that preceded them; they are meta-data, generative, kinetic, dimensional, networked and reactive texts. *Tavs* contain technological accretions of implementations and potentiality. As their potentialities accumulate, a state phase-transition (as when self-organizing criticalities [SOC][177] avalanche into different states) may occur. What language becomes then (after an SOC avalanche) is anyone's guess. This thesis takes the position that language will be perceived as living. Further I claim that language will be perceived as living because it is living.

Aesthetic animism is the attribution of livingness based on perceived beauty. Digitally-enhanced living language will satisfy the criteria of aesthetic animism. This change is not

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[176] There are many historians of technology and linguists who study the ways technology alters language. Notably, Walter J. Ong, Jay David Bolter, Marshall McLuhan, Friedrich Kittler, Johanna Drucker, Florian Cramer, etc…

[177] I am indebted to the discussions of self-organized criticalities (SOC) in Poorns, *Networks of the Brian.* SOC is a concept introduced by Bak et al (1987) "Self-organized criticality: an explanation of 1 / *f* noise". *Physical Review Letters* **59** (4): 381–384. SOC describes how non-equilibrium systems approach critical junctures. Poorns relates this to scale-free small-world networks that are hierarchical and modular (such as the brain), but I feel at a speculative level that the SOC concept is applicable to language (which follows a power-law distribution, is hierarchical, and to some degree – in its structure – modular).

without precedent; Innes, Ong, Lanham and Mcluhan (among many others cited in this thesis) document how inscription technology provokes powerful transformations in humanity's relation to and perception of signifiers. *Aesthetic animism* belongs to that species of argument.

The printing press (in its dominant epoch) modified the means of diffusion of literature and thereby transformed culture. Digital technology does far more than modify the means of transmission. It fuses creation and reception. It fuses sensory modalities. It injects memory into data at several levels of abstraction. It networks cultural objects. It gives letters kinetic skins.

What will this set of rapid ongoing changes entail?

Instead of being read, we will read being. Language, once living and endowed with sensory capabilities (hearing through microphones and seeing through cameras) and a body (of thick doughy 3D spline letterforms mingled with meta-data memory) will respond to us. After a time, the *presence* of responsive embodied language (the anticipatory quality of its responsive, tactile agility and nuanced sounds) will become normative. At this point an attitude avalanche may occur. Literary discourse will perhaps absorb the terminology of 3D modeling and finite state machines. Literary creation will become multi-faceted multi-modal playing within holistic devices.

What do these changes mean now?

In our era, dimensional language-art in time-based media fuses multiple disciplines. Structural synergy occurs between computation and animation; sensorial synergy occurs across sensory modalities (speech, sound, and vision). This thesis has explored the implications of this synergy through diverse examples drawn primarily from motion graphics, ads, art and digital poetry. In the following section, I deepen and broaden these conclusions and link them into other discourse as I develop a model of word-audio-video as symbiotic aspects of interiority-betweenness-exteriority.

5.1.1 A Theory of Multimedia Synergy: in-out-between

In order to understand how synergy works in multimedia, imagine assigning a vector or region of proficiency to each of the major components of a *tav*: text-audio-visuals. Let these vectors delineate the general directional influences exerted by sounds, images and words in a *tav*. Imagine, words are interior, sounds are in-between, and images are primarily outward. That is to say, a typical reader will take in words and the dominant strength of words (in comparison to audio or image) is descriptive of psychological interiority, subjectivity, and thought processes. Words convey thoughts and concepts that are extremely difficult to convey with a camera or a sound. Exactly the opposite is true of images, particularly video; these provide a quick instant sense of exterior space; navigational feedback is comprehensive, detailed and simultaneous. And sounds operate in-between, non-locally, moving between objects and subjects, expressing both external orientations and internal processes, emotively resonant.

Under this (admittedly over general) proposed schema, it's not difficult to conceive how *tavs (*text, audio and video) function as a synergetic system: amplifying interior subject (word), relational space (audio) and exterior environment (video).

In 1960 the cyberneticist W. Ross Ashby (echoing ideas proposed by Norbert Weiner in 1948) described how the brain was informed by its environment: "…coordination between parts can take place through the environment, communication within the nervous system is not always necessary."[178] In their 1980 work *Autopoeiesis*, Maturana and Varela postulated a model of the brain extended outward in cyclical connectivity with its environment, the inward cell assemblies of neurons receiving stimulus and provoking external responses which alter stimulus to feedback. Clearly, outwardness and inwardness are aspects of a conjoined system. As in *tavs*: vision, hearing and language intersect. Each has a clear region of strength that overlaps with, but is non-

[178] Ashby, WR, *Design for a Brian.* (1960) in Sporns, *Networks of the Brain* (2011)

replicable by, the others. Meaning emerges.

Digital technology fuses communicative modes in a way only previously offered in representational media by films. Films only rarely included text as part of their central media; film credits although key to a history of motion graphics and digital poetics are exiles which exist outside the body of the film, they are appendages or labels not aesthetic ends self-complete to themselves. What they clearly convey, however, is that words, visuals and sounds are not antithetical; there is capacity for their integration.

Tavs challenge readers to absorb semantic concepts and visceral visual sensuality simultaneously.

5.1.2 Outside Words, Interior Worlds

The yelp of an animal caught in the teeth of a predator impacts physiognomy differently than the cry of orgasm or religious ecstasy. Even using rudimentary 2D typesetting tools, it is possible to represent the rudiments of voice. "**HELP!!**" is different than "*Help?*" and "Help". Hearing a cry for "**HELP!!**" might activate a cascade of fear-flight hormones. "*Help?*" might initiate seduction. "Help" might be in a brochure. Graphic novels and comic books have understood the synaesthetic potentiality of visual words very well. In each case, adopting Varela's view, contextualized sonic appeal evokes a distinct transient cell assembly, a neurological hypergraph, an *ad hoc* neural network. It is my feeling that there is a deep correlation at the neurological level that can be leveraged between the affective volume of an acoustic cry, the ensuing waveform or neurochemical cascade, and the letterforms used to represent such an incident. Letterforms effect cognition as they mirror its processes.

Cadence expressible by letterform influences the architecture of cognition. In each case, geometric forms in the inscription technology evoke geometry at the physical level that

our surface personalities interpret as feelings[179]. It is these feelings that living language, augmented digitally, enhances by directly speaking to archetypal forms inherent within the body. The rudimentary 2D tools of italics, bold and underline are being superseded by an enriched set of expressive utilities: morphs, tweens, kinematics, etc…. These devices bring voice and temporality, cadence and intonation, emotive structure and animated ambiguity onto the page-screen-skin. The screen is the page by another game.

5.1.3 Aesthetic Animism Reconsidered

"You become what you hear so listen closely."[180] Charles Bernstein

Strong proposals about future general collective beliefs based on a nebulous marginal subject like digital poetry are not candidates for verifiability. The structure of human attitudes toward matter --what we conceive of as alive, to what we attribute the status of life – are diverse. Generalizations are generalizations. Yet the society we exist in has characteristics that define it; these defining characteristics modulate as technology modulates. There is a depth to our being that is not plumbed or known by news account or even psychologists report. It is to that depth that poetry speaks, or it is that depth that poetry speaks. And as poetry`s formal tools increase into volumetric kinetic meta-data it seems appropriate to consider how esoteric infinities at the core of interiority have been classified by various thinkers.

5.1.4 Lumps, Logarithms & Kristeva's *Chora*

"The experience which I am attempting to describe by one tentative approach after another is very precise and is immediately recognizable.

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[179] The seminal collaboration of Jaap Blonk with Golan Levin, *Ursonography* (2005) demonstrates how powerful real-time digitally-enhanced correlations between geometry and voice can be.

[180] Penn Sound. Complete Recording of Reading by Erica Hunt. June 20. 2005. http://writing.upenn.edu/pennsound/x/Hunt.php

> But it exists at a level of perception and feeling which is probably preverbal – hence, very much, the difficulty of writing about it…The experience in one form or another is, I believe, a common one. It Is seldom referred to because it is nameless."
>
> John Berger. 1980. "The Field" in *About Looking*. Pg. 200-201

With the concept of *aesthetic animism* what I am searching to express is a nameless preverbal apprehension of the otherness of something. How can language reach that non-other pre-I otherness? And with this thesis I hope to express how that apprehension of otherness is made available to us at the confluence of digital tech and poetry.

Julie Kristeva distinguishes the semiotic trace from the term *chora* (derived from Plato's *Timaeus*); *chora* is "an essentially mobile and extremely provisional articulation" (35). In other words, *chora* describes somewhere deep in the psyche: nebulous, pre-articulate and pre-verbal. Perhaps Eduardo Kac`s "A syntactical carbogram (Biopoetry Proposal #17)"(Kac. 191) for letters created with carbon nanotubes is floating nearby. But the *chora* Kristeva describes is basically without dimension. It is in that dimensionless space that esoteric topological intersections of sonic-forms and letter-forms are born.

For Kristeva, *chora* is antecedent to semiotics; it is an interiority that might be shapeless. It is "not yet a position that represents something for someone (i.e. it is not a sign); nor is it a *position* that represents someone for another position (i.e. it is not yet a signifier either); it is, however, generated in order to attain this signifying position" (Kristeva. 35).

Generated by what? By whom? As an experience, chora evades categorization. In a similar enigmatic way, I try to use the term *aesthetic* to denote experience antecedent to language, to induce instability at the core of how we perceive words as banal servants, to reintroduce them to their roots as invocation. Embodied but somehow non-accessible to consciousness, aesthetic experiences rupture subjectivity before it emerges. Primordial, concealed beneath and within language, beauty pierces the enclosure necessary for self-formation, it delivers perception over to reception, and

evokes an indeterminate situation. This delivery occurs regardless of media.

One of the tasks of poetry is to speak *chora,* to convey a direct jolt of existence without negating non-existence. At the digital interface between audio-visuals and language, in the malleable palpitating presence of reactive words that emit sound, an opportunity emerges for *chora* to refine its expression.

Before body delimited itself, amputated off the other and arrived as an identity, the world existed as proximal ooze; this ooze is the *chora* that digital technology sometimes provokes. This is why digital culture is a returning, a recycling, and a re-fusioning of literate sensibilities onto visceral apprehensions. And it is the textural verisimilitude and tactile irrefutability (conveyed empathically by mirror neurons) of digital typography that accesses both chora and literate consciousness simultaneously.

Eyes read as enteric viscera absorb. The cumulative ***whoompf*** of this knot evokes *aesthetic animism.* This mode of experience expands text into flesh, equalizes the gap between viewers and viewed, and resituates reading as a primal act. And if this process is dependent on technology then probably it will mimic technium's[181] entropic change and occur at a logarithmically accelerating rate.

We are on the curve toward a cusp. At the cusp, a letter contorting in mouth's eye.

5.1.5 The Expanded Field

> "Kac's work is not about biotech, but instead about a kind of "biopoetics" in which language, form, and life intersect."
>
> Eugene Thacker on *Electronic Book Review*.[182]

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[181] Kevin Kelly reluctantly introduces technium as a term to cover the totality of both technology and culture in *What Technology Wants* (2010).

[182] Source: http://www.electronicbookreview.com/thread/electropoetics/emerging . The EBR site states that last activity was at 10-13-2007 and the original post was at 10-05-2007. When will websites display who read them when and how? I am reading it. I am the latest activity. I want to see scratches in the page

In 1979, Rosalind Krauss influentially diagnosed the logic of modernist sculpture as monument, established why that logic was failing, and then suggested an expanded field for sculptural practice. Poetry is in the same position today as sculpture was in Krauss` era. Iconic poems are bastion-like monuments, inscrutable sturdy pompous edifices etched with innumerable critiques by self-perpetuating cliques. The logic and inspiration that raised them to esteem falters, critics repair the myths, but their infrastructures are crumbling.

Poetry needs now, more than ever, in this epoch of inexorable technological change, an expanded field. This call for an expanded field occurs regularly within the poetics community. One can see it in Gomringer, Drucker, Glazier, Kac, Bense, Bootz, Bloch, Bernstein, Hayles, Seaman, Douglass, Pressman, Cayley, Raley, Strickland, Landow, Ricardo and many many other prescient prophetic minds lost in the mists of marginality.

Eugene Thacker (reviewing Kac on EBR in 2007), states: "…*the very notion of poetics implies a congruence of some sort between language and life.*"

Expand poetics to include the aesthetic wherever it overlaps with language. Like food into the stomach, all seen or heard words hurtle inward, ricochet off the lateral geniculate, trajectory toward amygdale and hippocampus. There the words nestle down, they burrow and are stored and breed together, like with like. Some words eat others. Cliffs and forest are covered in them, writhing like sticky bees. Words inside the mind do not obey the categorical imperatives of reasoned thought that dictate what words in what contexts can and/or will be considered poetry.

Just for a moment, invert the anthropocentric view, and imagine that words speak to each other through poems. They are not spoken by us, they are speaking to each other.

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where eyes have travelled. Donald Norman's F-shaped reading-pattern gouged into the screen. Where are the information visualizations of reading as an activity? I want to see who is reading what I am reading as I read it. What mutating and shifting tribe am I a member of? Who is thinking what I am thinking? When will each of us collectively read with this level of augmented awareness? Reading will become poeisis community surveillance voyeurism orgy.

They don't care whether they have to use papyrus, digital networks, poets, cell phones, holograms, sculptures, video, cgi or billboards. Words want to speak. They use us to make them. They made computers be born so they could begin to develop faster networks for communication. Perched on our lips, they leap towards each other as sound.

5.1.6 What May Be

> My final disclaimer*: An expanded field of poetry in a hyper-entropic information culture includes speculation. Extravagant claims, preceded perhaps by extraneous disclaimers, framed in the discourse of uncertainty, are set out as probabilities.Ultimately no one can say how the future will evolve. To ascribe too much certainty to prognostications concerning aesthetic animism is foolish. To neglect, however, the momentous changes underway in both the means of production and reception of poetry (and mediated typography in general) is to ignore a technical tsunami whose peak seems not yet fully to have struck.*

To conclude: perhaps the state-space of digital poetry that utilizes dimensional typography has already been explored[183]. Pioneers (like Hayles, Kac, Cooper, Hartmann, Funkhouser, Sondheim, Andrews, Lewis, Miller and Valles) may have already charted most of the terrain. It may be that for the near future, digital technology will merely fill in the details, -- increase the rendering, raycasting and polygon count, enhance compositing detail and ease the use. Perhaps, there will be no paradigm shift in collective ontologies, no revolution in subtle apprehensions, no aesthetic animism.

It may also be that, like the video phone[184], volumetric text loiters on the periphery of technological evolution for an era. It may be that the notion of living language is

[183] As in the field of interface design with Engelbart's 1968 demo, which introduced the paradigm for the screen-based keyboard-mouse-network-email video-chat we continue to use today.

[184] Kevin Kelly points out (in *What Technology Wants*) that the video phone was first conceptualized in 1800s, the German post-office had a prototype working in 1938, AT&T set up a prototype system in the 1960s which attracted only 500 subscribers. Now of course, there is Skype, FaceTime, gChat video etc…, the paradigm has leaked into the mainstream but with much slower pickup than its proselytizers prophesied.

consigned temporarily to the trash, only to re-emerge when conditions are correct. It may be that volumetric-sonic-reactive text violates current cognitive multiplexing speed-limits and is thoroughly rejected as a literary device; if, however, cognitive speed-limits accelerate (as the rate of change of genetics suggests might occur) then multimedia literature might flourish. Even then, it may be that digital poetry never mainstreams, and instead fulfils a purposeful marginal niche role without inducing any subtle modulations in collective ontologies; until, one day in some unseeable future, poetry is discovered incipient underneath the most ordinary of notions.

Precipitous change in technology demands we reconsider and re-examine animist speculation as it concerns language. Bodies are structured matter; language is becoming increasingly structured and thus tacitly embodied. Letterforms will know who wrote them and who read them; and typography will be capable of disguising itself into our lived environments (either through motion graphics or augmented mobile apps). As these changes occur, attitudes toward the *literary* and *poetic* will shift, iconic traditions will be subsumed, and hybrid disciplines will emerge. Digital poetry might evolve into an aesthetic animism where letterforms exist as proprioceptive entities, reactive, intelligent, aware, and reflective of acoustic archetypes. Language might live.

A necessary precondition for living language is increased sensitivity to the temporal and ontological propositions imposed by design paradigms of typographic animation software. Writing must occur within software that is open to creativity: augmenting the fluid demands of whimsy, accident and tangents. Linear timelines are a potent paradigm for exploring logical temporality, but hybrid capacities and design modes that offer instrumental experiences (real-time change, constant feedback) are needed. When IDEs bifurcate into pragmatic ambiguity, then perhaps autonomous texts capable of transmitting nuanced living experience may arise.

Living language (embodied gestural and empathic in a way that it hasn`t been previously: pointing now to itself as thing) opens an opportunity for a deeper relation with how we communicate. Traditionally, signs are signifiers, tubes or tunnels toward

what is meant. Digital volumetric text points to itself as thing, expressive in how and who and what it is. Future readers may develop relationships with words as entities, relationships that are as primary and complete as the relation with the signified.

In this transition, the rudiments of an ecological attitude gestate, an attitude which recognizes the cohesive nutritive substrate of expression, words themselves as other, as us. My vision of 3D text is, however, neither ubiquitous nor utopic; 2D text will continue to dominate communication, and humans will not suddenly start loving language, harbouring letters, letting paragraphs dwell in them (clouds of them softly perspiring). Instead as always in our ambivalent contingent world, this potential expanded relational field for sculptured cognisant text may simply be ignored. Poetry is, after all, both marginal and central, its influence both fundamental and ineffable.

One more thing: until the words themselves learn to speak and we as their carriers permit it, language will be like the bacterial species in our gut, silent symbiotic teeming presences that we implacably host.

Language is dead. Long live language.

APPENDIX: Research Creation & Image-Essay

Research-Creation

During the course of this thesis I completed a substantial body of digital poetry research-creation which will be submitted in CD-ROM or USB-key form with my final deposition.

A USB-key edition of 10 years of work is also for sale at http://glia.ca/2011/usb/

As a visual supplement to all the verbal arguments, I constructed an image-essay which is online at http://glia.ca/conu/imageEssay/

APPENDIX: The Ekphrasis of Interiority

Essays on visual culture are often word-centric. Think of Barthes and Berger, two of the iconic modernist critics, whose resonant prose and incisive thoughts are part of a rich tradition of imagistic contemplation. Barthes wrote a book on photographs; there were only a few B&W images in it. John Berger's (extraordinary and powerful) book *About Looking* contains almost no images. What the mediated future holds for us is almost poetic (in the sense of haiku poetic, not epic poetic) in its fury: blurb becomes bite, image is co-opted by video, video is replaced by a render. Volumetric elliptic literacy.

Who even knows what ekphrasis means any more?[185] *Ekphrasis– the verbal description of a visual–* is (according to WTJ Mitchell) *a verbal strategy, a description not a depiction, a cite not a sight.* He traces its origins back to Homer, and sees it as alternating between being at the center of oratory arts, the essence of literary style, and a curiosity. Then Mitchell in his characteristic way points out something very true: words often bring vivid pictures into our minds. This is the paradigmatic role of language and "the point in rhetorical and poetic theory when the doctrines of *ur picture poesis* and the Sister Arts are mobilized to put language at the service of vision"(152-153).

Ekphrasis as a paradigmatic literary device for describing exteriority may be on the verge of extinction or marginalization. It is the ekphrasis of interiority that will survive and flourish. The exposition of Barthes and Berger each utilize exterior ekphrasis sparingly, theirs is a discourse of interior sensations, ruminations and reflections.

Every essay on images is an image of an unseen interior.

[185] MS Word 2010 spell check has no idea that ekphrasis is a word.

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