Writing Technologies

The Extent of Text:
Producing Meaning Beyond Intuition

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> In this discussion [of 'the book to come'] we will surely have to come back to […] religiosity, to this quasi sacrality, more precisely to this quasi resacralization that, with all the political issues it involves, has marked the entire history of technologies of inscription and archiving, the entire history of supports and printing methods. [...I]t is obvious, for instance, that if our generation is suffering from seeing the book yield ground in the face of other supports, other modes of reading and writing, this is partly because, inevitably, it has resacralized everything connected with the book (its time, its space, its rhythm, starting from the ways it is handled, the ways it is legitimated, even the body, the eyes, and the hands bent around it […])
>
> Derrida, *Paper Machine*

In this essay I would like to offer a new term for Media-Specific textual studies to consider: 'kinaesthetic extension'. I will outline the term's function (to describe a texts novel site/s for meaning making) and the reasoning behind its name (its parts appropriated from Cognitive Science) before demonstrating already existing examples in the work of E.E. Cummings, Jonathan Safran Foer, and various critics and theorists, in particular Roland Barthes, Katherine Hayles, and Jerome McGann. My aim in drawing a term out of the discourse of Cognitive Science is to try to contribute to the emergence of the 'Cognitive Humanities,' showing how methods and models from one field can be usefully applied as 'objects-to-think-with'[1] in another. As an interdisciplinary subject, Cognitive Science is already open to work from numerous fields, yet the vital input of voices from the Humanities, with their unique interpretive

skills and knowledge of the history of ideas, will only come through continued exposure to scientific hypotheses and their application. In this instance I hope that such exposure also functions as a provocation toward greater attention to the shifting boundaries of the meaning making text, an increasingly important question as the substrate and means of production of contemporary written work move from the specificities of printed-upon paper to those of the plastic (in both senses) screen.

Following MSA
In her landmark work *Writing Machines*, Katherine Hayles called for literary scholars of all stripes, but particularly those involved with what would become more formally termed 'electronic literature', to adopt a more Media-Specific Analysis (MSA). Five years later Amazon's Kindle e-reader pushed extended engagement with digital text into the mainstream, to sit alongside the already established desktop, laptop, and mobile phone reading, and various digitally inspired print works (such as Mark Z. Danielewski's intricate *House of Leaves*[2]). The Kindle, and portable e(lectronic)-reading in general should be of particular interest to proponents of MSA because it reopens, reinvigorates, or, for most non-academic readers, simply begins the debates surrounding embodiment and materiality in textual comprehension. When Jerome McGann wrote on the subject of the embodied text in *The Textual Condition* it wasn't surrounded by innumerable newspaper articles (let alone blogs and comments) speaking rapturously about the scent of paper books, old or new, and the joy of being able to read them in the bath.[3] Now its rare for a week to go by without our coming across some variation on the words 'e-reading is fine, I guess, but what about the *feel* of a good book?'. Christine Shaw Roome, a professional fundraiser for an academic library in Canada, writing this year about her first experience of reading from an iPad for the blog *Life as a Human*, reports an illustrative example: she wonders if she's now even reading a book at all, so drastically has the feel of the activity altered:

> [Her husband interrupts her reading] 'I'm reading a book!' But, was I? I was missing the tactile features of the book, which often comfort me. The smell and feel of the book and the way you can see how far you've read by measuring the thickness of the pages. When I buy a book, I always take time to look at its design — the

> type face, the page weight and colour, the way the
> ends appear to be torn or are cut precisely. The texture
> of the cover and the photography or illustration that
> accompanies the title all draw me in and are part of the
> experience of enjoying a book. Sometimes, I buy a
> book just because I like how it feels in my hands.[4]

Roome offers us a good survey here of the most familiar elements of the debate surrounding reading on screen: its no longer seeming to be a book; its not *feeling* like a book; its not smelling like a book; the lack of the wedge of remaining pages acting as a consistent indicator of progress; and the confusion of the object as aesthetic artefact.

The following example similarly comes from a blogger reflecting on her relationship with books in a post-Kindle world, and is again typical of the kinds of conversation that are occurring online:

> I don't see the act of reading as a purely word-based
> experience. Reading is also tactile. Reading should
> involve interaction between you and the text in your
> hands. The speed at which you turn to the next page
> (or flip back to the one before) matters. That accidental
> glimpse you got of page 273 (while still only on page
> 32) while fishing around for your bookmark matters.
> The weight of the book in your bag — that subtle
> reminder that it's waiting for you — matters. The paper
> stock matters! The font, the letter-spacing, the margin
> width! It *all* matters! [...] And don't even get me
> started on the smell of old paper and fresh ink!.[5]

I don't intend to invoke these observations flippantly, but rather as an acknowledgement that we are surrounded by extensive folk phenomenological reports of the change in reading experience prompted by e-readers; the mere existence of the new equipment changes our engagement with the old. Perhaps this is something akin to CDs replacing vinyl: again, it wasn't until the presence of the new medium that the particularities of something that already existed began to be, not appreciated (presumably they were already appreciated, even if not identified as themselves), but vocalised, rhapsodised. But there seems something special about this most recent case, maybe because it deals with the seemingly primordial written word, or perhaps because it deals with embodied experience in the perception of an increasingly spectral

digital life. Regardless, that so many non-academic voices are now speaking about such specific aspects of the codex as paper weight, typography, contrast, pagination, the heft of the object, in short that they are discussing the impact of the warp and woof of something in the world on the reading experience is a minor miracle, and one which should get any researcher of recent or historical writing technologies excited, particularly those who have bought into some flavour of MSA.

Hayles' Media Specific Analysis calls for us to '[u]nderstand [...] literature as the interplay between form and medium, MSA insists that "texts" must always be embodied to exist in the world. The materiality of those embodiments interacts dynamically with linguistic, rhetorical, and literary practices to create the effects we call literature'.[6] In this way a media specific analysis would come from 'a mode of critical interrogation alert to the ways in which the medium constructs the work and the work constructs the medium'.[7] Hayles saw the need for MSA arising from a neglect, in various forms of literary study, of materiality's capacity to mean, but '[l]iterature was never only words, never merely immaterial verbal constructions. Literary texts, like us, have bodies, an actuality necessitating that their materialities and meaning are deeply interwoven into each other'.[8] Hayles sees the body of the codex as having become neglected through long use, through over familiarity, and most often by literary scholars, the very people who should have been paying it the most attention.[9] Suddenly, at the birth of an increasingly normalised digital reading, the body of the codex and the body of the reader, in their complex of gestures and affects, are beginning to be considered anew alongside the continuing discussion of where it is that a text actually occurs.

The successful asking of this question, therefore, seems to have become increasingly significant, and in order to ask it better I'll now turn to considering the work of two writers and several theorists who have, consciously or not, challenged the boundary of where the essence and production of meaning takes place. It's during this discussion that I'll also detour into the psychology of handed tool-use to trace a substantial metaphor for my thinking and to try and bring back some ideas which might be of use to future study.

Apart from syntax

The first lines of one of E.E. Cummings most famous poems reads:

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since feeling is first

who pays any attention

to the syntax of things

will never wholly kiss you.[10]
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Robert Wegner, drawing on these words, suggests that within Cummings' poetry can be found a warning: 'The danger of unquestioning obedience to the syntax of things is sterility'.[11] For Cummings the unquestioning obedience to the received 'rules' of things results in the inability to wholly engage with the world; far better to test, to provoke and be provoked. Not that this led Cummings to wholly ignore such syntax; rather he paid meticulous attention to how others' adherence to the rules of language could enable their subversion, as an act, to mean. In his deployment of, on the surface, seemingly gnomic or even arbitrary typographic quirks Cummings asks us to simply look closer at how and why aspects of the page, and therefore of any ruled-over space, might have the significance they do.

Barry Marks articulates the literary power of these devices, saying that they 'enable the reader to hear trains "chewing". They fracture the reader's expectations about the meaning of words and their relationship to one another',[12] a process which both requires and inspires a particular intensity of observation which has an unavoidably embodied component. Cummings' most famous gesture in this regard is his play with capital letters, extending out to the inscription of his name at times.[13] But rather than a simple affectation Lloyd Frankenberg suggests that the device is enabling, allowing 'his capitals the ability to say more than their obvious remark, "I am starting a line". They [...] were restored to the ear ('mOOn Over tOwns mOOn'14) [...] He goes behind the rules to the reasons'.[15] Cummings' outlandish use of line breaks and punctuation can often, if not always, be traced back to similar impulses. Marks, for instance, picks apart his use of the lines 'so/!f!/t'[16] and reveals again that deeply embodied aspect in the observer, the listener, the reader:

> By isolating the 'so' of 'soft,' [Cummings] added a
> 'logical' intensification by suggesting the idea 'so soft.'
> More importantly, the exclamation points surrounding
> the 'f' make the sound of the letter a metaphor for his

precise meaning. Cummings says to us, 'If you really want to know what I mean by "soft", then listen intently, even feel the letter "f". Say it to yourself and observe the way you blow air over your lips. That's my meaning!'.[17]

An often overlooked aspect of Cummings' work, however, lies in his use of the typewriter, the impact of which, I'd like to argue, he manipulates in much the same way as the implied sounds and stresses of punctuation and capital letters. Similar to the function of his other devices, Cummings causes the equipment to go against the grain of its position: rather than being meekly invisible, allowing the words the illusion of speaking for themselves uninterrupted, Cummings instead uses the typewriter in such a way as to extend his and its capacity to mean. I say overlooked not because no critic has ever spoken of it (far from it as we shall see), but because in the reproductions of his work in collections and online, in critical editions and quotations in scholarly journals the particular patterns and messages of the typewriter, so richly developed in the poetry, are occluded, not merely removed, but erased and made impossible to think of.

In an article that would be redrawn in his later biography, Richard Kennedy recounts Cummings' first experience of Ezra Pound's 'The Return' which he discovered in 1916, immediately prior to the summer where he would begin the meticulous research which would lead to his purposefully machined poetry. Kennedy explains how

> [h]e was moved by the linguistic expressiveness of the piece, which used modern diction and oblique treatment for a classical subject, the decline in the power of the gods. But the arrangement on the page, he said, 'the inaudible poem — the visual poem, the poem for not ears but eye — moved me more'. […] For Cummings, Pound's poetic example provided a release from formal bonds, and as he sat at the family typewriter trying out visual arrangements, he saw that there were immense possibilities for expressiveness in the combinations and the separations of the words on the page.[18]

I'd like to pause here, with Cummings about to discover the possibilities of the typewriter, to suggest a critical idea with which to frame the

discussion of a poem which is clearly a product of these experiments. The next section goes into the neuro- and cognitive psychology of tool use, but I will take some time to explain each idea clearly before putting them to work.

Incorporation and extension
Firstly I'd like to introduce the notion of a body schema, a classical neurological paradigm which has been reinvigorated by contemporary research. The body schema is essentially the mind's internal representation of the material body's external boundaries and position in space:

> The somewhat anecdotal concept of body schema has been greatly enriched by modern neuroscience. […] First it has been found that besides proprioception [the awareness of one's limbs in space, particularly focussed on feedback from joints], other sensory modalities (typically somatosensory [sensory reception from skin, muscle, bone, internal organs, and cardiovascular system] and visual) are crucial to its construction. […] Second, single-neuron recordings in the monkey brain have changed the vision of a 'purely perceptual' construction of a body map in the brain towards a more multicomponent, action-oriented one. In this view, multiple fronto-parietal networks integrate information from discrete regions of the body surface and external space in a way which is functionally relevant to specific actions performed by different body parts.[19]

Angelo Maravita and Atsushi Iriki here outline how a mental representation of the body is created and constantly updated, and part of that updating includes an action element: rather than a schema formed through idle sensory perception, the body learns about itself by acting, becoming aware of how its surfaces and forms functionally relate to an immediate environment. It is this sense of awareness of the shape, position, and extent of the body during use that I would like to focus on, a means of production of body schema that is often termed 'kinaesthetics'.

What is fascinating about this internal measure of ourselves is that it can, unwittingly, be extended out into the world. As with the classical

body schema paradigm there are numerous precursors to the empirical demonstration of this phenomenon of schematic plasticity, the most frequently cited coming from the phenomenological work of Martin Heidegger who described a perception of equipment encountered in use that he termed 'readiness-to-hand'.[20] Though the implications for this state have been re-imagined by contemporary philosophers,[21] mainstream interpretations have most often described readiness-to-hand as the melting away of tools during successful use, their becoming to the user as invisible to concern as the hand which holds them; 'in its readiness-to-hand, it must, as it were, withdraw. [...] That with which our [...] dealings proximally dwell is not the tools themselves. [...T]hat with which we concern ourselves primarily is the work'.[22] The neurologist Frank Wilson, in his work *The Hand*, similarly writes about this act of 'becoming one' with equipment, offering a report on experience which would be recognisable to anyone familiar with the canonical interpretation of Heidegger's tool analysis:

> The mystical feel comes from the combination of a good mechanical marriage and something in the nervous system that can make an object external to the body feel as if it had sprouted from the hand. [...] The contexts in which this bonding occurs are so varied that there is no single word that adequately conveys either the process or the many variants of its final form. One term that might qualify is 'incorporation' — bringing something into, or making it part of, the body. It is a commonplace experience, familiar to anyone who has ever played a musical instrument, eaten with a fork or chopsticks, ridden a bicycle, or driven a car.[23]

In their review of the contemporary field, Maravita and Iriki consider the mechanism for such acts of ready-to-hand incorporation, examining in particular the research into

> [w]hat happens in our brain when we use a tool to reach for a distant object [...i.e. what] changes in specific neural networks that hold an updated map of body shape and posture (the putative 'Body Schema' of classical neurology). These changes are compatible with the notion of the inclusion of tools in the 'Body Schema', as if our own effector (e.g. the hand) were elongated to the tip of the tool.[24]

The evidence presented in this review provides empirical support for Wilson's notion of incorporation and Heidegger's readiness-to-hand, arguing that tools, at least functionally, can become a part of their users. Maravita and Iriki begin by describing the neuroanatomical discovery of 'premotor, parietal and putaminal neurons that respond both to somatosensory information from a given body region (i.e. the somatosensory Receptive Field; sRF), and to visual information from the space (visual Receptive Field; vRF) adjacent to it'.[25] This is to say that there are 'bimodal' neurons which fire both in response to the somatosensory sensation (physical experience) of a body surface such as the hand, and also in response to visual stimulus in the area immediately surrounding that surface; a touch of the hand or visual stimulus close by will cause the same bimodal neuron to fire. Referring to two studies in particular, Maravita and Iriki outline the training of Japanese macaques to use a rake to reach for a food pellet dispensed out of their (the macaques) reach.[26] 'In these monkeys, neuronal activity was recorded from the intraparietal cortex, where somatosensory and visual information is integrated'.[27] The studies aimed to record the activity of the bimodal neurons in this area. When using the rake for a sustained period of time, training its use, it was found that these neurons fired in response to visual stimulus in the area surrounding not only the hand, but also that around the tool; the mind of the macaque had begun to treat the rake as a part of its body, it had incorporated the artefact into its body schema.[28]

If the seeming fixity of the body schema can in reality be expanded to include tools, how else might minds mesh with objects in the world? Andy Clark and David Chalmers' work on 'The Extended Mind' begins with a related question and answer: 'Where does the mind stop and the rest of the world begin? […] Some accept the demarcations of skin and skull, and say that what is outside the body is outside the mind…We advocate…an *active externalism*, based on the active role of the environment in driving cognitive processes'.[29] When we count on our fingers, or use a pencil and paper to write down a shopping list, or increase our reliance on our mobile phones and internet document storage instead of keeping things in memory (or learning them in the first place), then we actively recruit items in the world to further our cognition (and note that these aren't mere memory aids, they also affect what and how we think to a greater or lesser degree, and with effects and an effectiveness we may or may not appreciate). Biological

boundaries must be questioned, Clark and Chalmers say, as a common sense mapping of the boundaries of mental work as such work also goes on in the world. For instance, what if the work to be done, save for such boundaries, would be considered a fully cognitive process? They invoke a 'parity principle' to begin such a thought experiment:

> If, as we confront some task, a part of the world functions as a process which, *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world *is* (so we claim) part of the cognitive process. […] In these cases, the human organism is linked with an external entity in a two-way interaction, creating a *coupled system* that can be seen as a cognitive system in its own right. [...] If we remove the external component the system's behavioural competence will drop, just as it would if we removed part of its brain.[30]

Maravita and Iriki show how tools can be brought 'on board' into the kinaesthetic representations of our bodies in action; here Clark and Chalmers state that our cognition can pass the other way and be spread onto objects in our environment in such a way that the *system* of brain, body, and object can be thought of as cognizing (rather than simply the post-dualist construction of body-affected mind). If we then take this parity principle and apply it back on to Maravita and Iriki's validation of incorporated/ready-to-hand tools we can come to the following formulation: if there exists in the world a tool even temporarily incorporated into a user's body schema, where if the work performed with it was achieved by the user's bodily assemblage alone we would consider it the work of the body, then it is best considered as integral to the working assemblage, not a mere addition to the thing which works. For example, if driving a nail could be achieved by the brain's stimulating the shoulder working with the bicep, working with the tricep, working with the elbow, working with the forearm, working with the wrist, working with the hand, working with the fingers, then we would say that the nail could be driven by the body, or by the arm or hand if we ignore the entailed apparatus. In the same way, when the hammer comes 'on board' with the arm, it extends our concept of the arm's abilities, and the new *assemblage* is able to drive the nail — the hammer cannot drive the nail, the arm cannot drive the nail, only the assemblage has that ability. However, though the hammer is as invisible to us as any other biological element within the assemblage, at least during the

time of practiced use, we still choose to mark a distinction at the boundary of skin and object, seeing user and thing rather than a machine comprised of both, a separation which our brains, for that time of work, does not. Clark and Chalmer's parity principle asks 'why'? As we'll now see, this question might be usefully put to work in considering the boundaries of written texts.

Kinaesthetic extensions

I would like to re-appropriate the term 'kinaesthetic' as a critical theoretical term, one which I see as bound to Textual Studies. I would like to use the term to suggest that whilst we might naturally be kinaesthetes of our own bodies, appreciating consciously or unconsciously our gestures and their changing shapes in concert with tools in the world, we can also become increasingly kinaesthetically aware of textual bodies, that the extent of their forms might be brought to consciousness and, crucially, made malleable in much the same way as our own in-built kinaesthetic experience. A textual kinasethetics would be the attempt, or critical recognition of the attempt, to expand or alter a reader's notion of what should properly be included in the meaningful assemblage of a text in action.

In this way, McGann's project in *The Textual Condition* could be considered under the umbrella of textual kinaesthetics as he passionately describes the text as 'a laced network of linguistic and bibliographical codes. […S]uch matters as ink, typeface, paper, and various other phenomena…are crucial to the understanding of textuality. […A]ll texts, like all other things human, are embodied phenomena, and the body of the text is not exclusively linguistic' (1991: 13).[31] In this call for a more nuanced notion of what should be included in the assemblage of the text, McGann extends our conception of 'text,' 'codex,' and 'page,' changes their meaning, changes what should be included under their name, and in so doing alters the ways in which we apprehend their bodies. McGann's work, and similar projects from across textual and book history studies[32] have been vital in displacing the automatic privileging of script-content as the ultimate meaner, allowing for an image of the text, a body image, which is materially aware.

In the same way that cognitive science is revealing how we are able to spread our cognitive load onto our bodies (in gesture, or counting on our fingers for instance[33]) and out into objects in our environment, I would like to argue that critics, theorists, authors, poets, and playwrights can

perform a function analogous to psychologists: revealing how texts can spread the load of meaning further than the previous sanctity of their own minds (their content), onto their bodies (as Textual Studies and Book History have long argued), and out into objects in their environment in the vein of Clark and Chalmer's Extended Mind.

Barthes and McGann both speak of such objects when they rightly bring the reader into the meaning making of text. They, and the critics they've influenced, have contributed to a sense of text that can describe operations of meaning which exist beyond the material body and script-brain. As Espen Aarseth describes them, '[t]exts are cross products between a set of matrices — linguistic (the script), technological (the mechanical conditions), and historical (the socio-political context)';[34] such work seems to suggest that we should think of text not as a thing, even in a particular instance, but instead as an interaction, an assemblage triggered by a script presenting object (e.g. a codex) meeting an equally embodied reader-subject. The reader brings their baggage, mental and physical, and the codex brings its own along too, both lexical and material. Barthes' essay 'From Work to Text' is clearly inspirational in this regard: he suggests that a text is immune to single interpretations, and concerned with a web of interactions surrounding artefact and reader, a polyphony of interpretation, origination, and intertextuality, aspects which are necessarily untheorisable and unquantifiable in the particulars of their effects on any one reader at any one time.[35] The text's meaning is produced anew in each play of these meetings, but in some cases only to the extent that the reader is made aware of them. The material existence of the page can mean in all sorts of ways that are unconsciously recognised and incorporated into the text, but some meaning is made only when it is brought to our attention, dragged in out of the cold so that we can recognise its role.

I would like to explore these specific, identifiable 'calling-outs' from works to events outside of their immediate material existence, particularly those outside of readers' typical interpretation strategies. When we have become complacent with what a written text can be, a kinaesthetic extension is an instance in any work which teaches us to expand our comfortable image of how far a text reaches, and provides a new extensive way of making meaning for future readers and creators. The specific study of such would be Textual Kinaesthetics.

Extension in practice

In the summer of 1916, Cummings followed his encounter with Pound by sitting down at his typewriter and producing line after line of formal experiments, learning what the machine could and couldn't do to words and letters and the significance of their arrangement. In the first poem of his collection *95 Poems* we can see how this play came to fruition in a kinaesthetic extension:

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l(a


le
af
fa


ll


s)
one
l


iness
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[36]

This poem is a great example of one of Cummings' almost haiku like forms. At first it looks like a mess of letters, but then we come to see the words, just four of them — in the parenthesis: 'a leaf falls', and surrounding that: 'loneliness'. It's arrangement enacts the falling of the leaf described, the alternating 'af' and 'fa' in the 4th and 5th lines suggesting its twisting descent on its way to the longest line, 'iness', that forms the ground; in this respect it is almost a concrete poem. Marks, during an extensive discussion of these few words, states that 'Cummings' poem does not make an assertion about loneliness. Such an assertion would not have been very interesting [...] Instead, the poem combines the abstract idea and the concrete image in such a way as to show us something…it asks us to look at the printed page'.[37]

What, then, is particularly important about the materiality of this poem? Marks begins by asking us to look at the word outside of the parenthesis:

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l

one

l

iness
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'Thanks to the modern typewriter,' he says, 'whose letter 'el' (l) doubles as the figure 'one' (1), Cummings shows us that a very commonplace word is really a quite singular word. It states its meaning five times. It says "loneliness", but it also says, "one-one-one-*i*ness" (that is, the quality or condition of being "I")'.[38]

The significance of the typography is only available if we understand that the text extends beyond the material artefact of the poem from which it originates. It's not enough simply to see that there are what appear to be numeral 'ones' on the page, because then we would misread the poem, we couldn't read the word 'loneliness'. Typically readers gloss over such peculiarities of typewritten typography so that they might get to the 'text itself', appealing to a pre-established gestalt of what should be read. But this poem punishes such adherence to the syntax of things by withholding meaning, becoming boring. It's not just the final means of production that are written into the poem, not just the printing press and the paper, but also the equipment of writing, of thinking, that Cummings deployed. Forever enshrined in the poem is its inception, and for anyone who works it out for themselves, or becomes aware of Marks' own kinaesthetic study, his bringing to light of this peculiarity of the text, they cannot help but consider it and to go looking for it, or something similar, in Cummings' other work. And this is important because the text, when it now makes it into various reproductions, often isn't reproduced in even some simulacra of typewritten script, therefore erasing, in the absence of Marks' critique, the poem's full capacity to mean. *With* Marks' critique, however, every edition can become richer; even in the absence of the reproduction of a particular machined typography there is an extra layer of meaning as it's recalled.

With this in place we can read the poem more fully, seeing that it is a mess of singulars and articles. To start with, it's the first poem in the

collection, labelled simply 'I,' or one, and now the first line potentially reads 'one,' then 'a,' the indefinite article. Or, as Iain Landles argues, it might read 'la,' the French feminine singular, followed, in the second line, by 'le,' the masculine.[39] With both Marks and Landles' readings in mind we might well ask whether the representation of the sexes there refers to the two els, now ones, of the fifth line which sit paired whilst the wholly separate other ones mope at opposite ends of the clipped lines 1-8. What can make us feel worse when we are lonely, after all, than seeing a happy pairing? But, to the contrary, there might now be a tension in the letters after 'leaf,' from the second half of line four, which now reads 'all's one, one-iness,' or 'one-liness,' a statement either that everyone and everything is always alone, or, in another twist, that instead we continually live 'at one' with the world, an assertion which subverts, trivialises, or perhaps provides a Whitman-esque solution to any temporary feelings of loneliness that we might have.

None of this could present itself were it not for the typewriter being dragged out of obscurity and into the text. Marks concludes that 'Cummings' treatment of loneliness adds to the word not a semantic quality but what critics of the visual arts call a "plastic quality." He does not deepen or extend its meaning in any way; it has suddenly become vital to the touch, as it were, and has become an object of delight'.[40] Something different is going on here than a text merely referring with its content. When the poem talks about an apocryphal single leaf falling it doesn't bring the materiality of leaves into the text's meaning, only meaningfulness, as a single leaf falling relates metaphorically to loneliness. When the poem 'calls-out' to the typewriter, however, it brings the materiality of that object into meaning, and not meaningfulness; the typewriter's operation has very little to do with loneliness, and yet it holds much of the burden, in the poem's extended text, of producing meaning. As Adam Kirsch notes, 'Cummings was not the first poet to use a typewriter, but […] he was the first to take advantage of its power to control the exact spacing and shape of every line, and thus to make a poem's visual appearance as important as its musical rhythms. What looks like a thin trickle of letters becomes, to a reader who has learned Cummings's tricks, a picture in print'.[41] More than a picture, it becomes an extensive object, one not limited by the boundaries of its scriptural brain, or paper and ink body, but a *text*, something always and unrepeatably unique in its every expression.

Foer's ruptured pages

I'd like to conclude with a brief consideration of Jonathan Safran Foer's *Tree of Codes*[42] in relation to the theoretical concerns outlined above, and to come back to the rise of e-reading and the reinvigorated concern with materiality.

Tree of Codes started life as Bruno Schultz's *The Street of Crocodiles*;[43] Foer printed off Schultz's novel (his favourite book) and set about erasing letters and words and sentences to produce a new work, the sTREEt OF CrOcoDilES. The book we get to hold, however, is not simply the words that Foer has hewn from the original, instead every copy is individually die-cut, the physical holes in the pages mirroring the now missing script from Schulz's novel. What we encounter is a straightforward paperback cover surrounding a collection of leaves that are more absence than presence, where we can see through to words 10 or 20 pages on from the space that we're 'meant' to be reading. Needless to say its both beautiful and infuriating to interact with, impractical certainly, but I haven't seen anyone flick through it who hasn't experienced some frisson of excitement or wonder.

Various commentators, before the book was even released, were remarking on the form's relationship with the cut-ups of William Burroughs, the self-imposed constraints of the Oulipo group, and, most often, with Tom Phillips' work in *A Humument*.[44] Phillips' book is perhaps the most obvious comparison as he too started with another author's work and produced an artefact recognisable as a novel at the end of his process, painting and drawing over the lines of W.H. Mallock's *A Human Document*.[45] But there is an important difference between Phillips' and Foer's creations. *A Humument* is an artist's book, a codex produced in a meticulous small run (in this case a single volume, though Phillips frequently creates replacement pages as updates). Though you can walk into most any large bookstore and buy a copy, or order it online, what you're getting is a facsimile in the same way that a postcard of the *Mona Lisa* is a facsimile; the postcard and the shop bought paperback are undoubtedly objects for consideration, and both arguably remain depictions of art, but, in deference to Walter Benjamin, the *aura*[46] changes between the artefact in the Louvre and that tacked to the wall of the study. The same is not the case with *Tree of Codes*: every copy is the primary artwork, its meaning is richest in its incarnation as a mass(ish)-market paperback, not as the collection of Foer's scrawled-on printed sheets. The aura is *in* the mechanical reproduction, not despite it; that anyone can have access to it holds the wonder.

The kinaesthetic extension I want to focus on in the work comes in part from this dispersion of significance, and is also partly gestured towards by the recent increase in discussion of so-called 'redacted' documents. Boris Kachka, interviewing Foer for *New York* magazine, describes reading *Tree of Codes* as 'a little like going through an FBI document full of blacked-out passages, except that the excised portions are now holes through which you get glimpses of subsequent text'.[47] *A Humument* never felt like a redaction, just a creative use, an ever adding, not removing of value. Maybe it's the way that Phillips' paint and ink, and the paper and glue of his collages sometimes only partially obscures the text; his practice allows a palimpsest to emerge. In Foer's work, of course, this can never happen: Schulz's text is obliterated, and that pang of regret (that I have no doubt will be experienced as an eerie 'is this...ok?' by some readers), that a book has been somehow destroyed to make this one, becomes significant in a way it might not have in a time less sensitive to leaked dossiers, expenses scandals, or whistle-blowing sites' attempts at selective and protective censorship. Plain white pages with sections missing, things lost through effort, black ink replaced with space, with depth, undoubtedly feels politically resonant today. The sanctity of intact books is surely tied to a belief in their wholeness as a form of truth, and that pang of regret at a desecration becomes tied, in *Tree of Codes*' form, to our belief that redacted documents aren't an 'interpretation' or a 'version' or an 'artwork,' they're a species of lie.

A kinaesthetic extension emerges from this appeal to wholeness: Foer's text calls out to the discussions of the fate of the book, exemplified by Dorfman and Roome at the start of this essay, in order to produce a meaning which extends beyond the brutal and beautiful materiality of its production. It's a novel extension of textuality if only because its new in its particular instantiation, but it seems no coincidence that this book appears at this time and that fact in itself has meaning. E-reading isn't explicitly the subject of the work, but in its impetus in heightening the debate of digitisation's effects on the power and reception of the printed word it can't help but draw these concerns into meaning. In this regard, Foer has commented on his text's relation to such issues, if not their ability to mean as such, and it is worth noting the bodily concerns he invokes in relation to those of Cummings' devices seen above, a reminder that the work of the text can cause us to increase our attention more generally:

> I started thinking about what books look like, what they
> will look like, how the form of the book is changing very
> quickly. If we don't give it a lot of thought, it won't be
> for the better. There is an alternative to e-books. And I
> just love the physicality of books. I love breaking the
> spine, smelling the pages, taking it into the bath [...] I
> thought: What if you pushed it to the extreme, and
> created something not old-fashioned or nostalgic but
> just beautiful? It helps you remember that life can
> surprise you [...] I love the notion that 'this is a book
> that remembers it has a body'. When a book
> remembers, we remember. It reminds you that you
> have a body. So many of the things we may think of as
> burdensome are actually the things that make us more
> human.[48]

What *Tree of Codes* comes to mean, in the time in which it lives, depends on a conversation which surrounds it, and to a reader in 50 years who doesn't realise the weight Foer intended for its body to refer to, someone who has seen all the various iterations of books that will come to pass, it can only mean less and less until a critic points out what was occurring at this moment where some authors were forced to become interested in remaking print as sacred, as it seemed, to them, to always have been. For Foer, this sacredness is written into a burdensome body, not a *memento mori*, but a book which can't be skim read because Foer's done the skimming, can't be digitised because what would be the point, and can't be ignored because, well, *look* at it.

In a now meaningful twist, *A Humument* was released in a critically acclaimed iPad edition at the end of last year, on the 15th of November, the same day that *Tree of Codes* was published.

Conclusion
There must always be a first kinaesthetic extension for any reader. McGann has to tell you how paper means; Barthes has to show you that the reader makes meaning; Marks has to point you toward the typewriter; or you can work it out for yourself, but no aspect comes to us theorized, preformed, and complete, any more than we start learning to read already knowing how letters make words. Cummings' play with the typewriter was novelly extending in a way that his expressive play with capitals and punctuation wasn't: a great many artists and readers knew that letters and interruptions could be made to mean, but no one

had played with the typewriter quite as Cummings did. And if we were to find some writer that had then it wouldn't change the point, they would just be the originators of the extension — this is the critic's argument, not the theorist's. Any device or practice is extensive for someone who encounters it for the first time; if someone repeats a project then it might be extensive to any unfamiliar reader, but to the reader who knows the first experiments it becomes something else, maybe just another experiment, maybe something derivative. If we want to argue that a text is definitively extensive then we must prove that it is the first to call a new way of meaning into being, or the first in a long time, or the first in a culture, or the first in a particular form. But none of this precludes a shamelessly derivative work from acting as a kinaesthetic extension to a reader naïve to the history in which in sits.

I would like to repeat myself a final time for the sake of clarity. Two things are extended by a textual kinaesthetic extension: i) the particular text's capacity to mean, and ii) the previously naïve reader's/s' understanding of what might constitute the active range of a form. My hope is that the term works as a provocation to thinking about what we intuitively attend to when we read a text, and how this gestalt of elements can be manipulated and expanded by writers and critics, that indeed it must be the case because of the nuanced conception of text that we've already inherited.

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Notes

1   Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Touchstone, 1995), p. 47.
2   Mark Z. Danielewski, *House of Leaves* (London: Anchor, 2000).
3   Jerome J. McGann, *The Textual Condition* (Princeton: Princeton University Press, 1991).
4   Christine Shaw Roome, 'I've Got the Screen Eyes to Prove it: How Do Ebooks Really Compare to Traditional Books?', *Life as a Human* (15 March 2011) <http://lifeasahuman.com/2011/arts-culture/books/iv-got-the-screen-eyes-to-prove-it-how-do-ebooks-really-compare-to-traditional-books/> [Accessed 18 March 2011].
5   Anna Dorfman, 'Tree of Codes', *Door Sixteen* (18 November, 2010) <http://www.doorsixteen.com/2010/11/18/tree-of-codes/> [Accessed 15 January 2011]. Emphasis in original.
6   N. Katherine Hayles, 'Print is Flat, Code is Deep: The Importance of Media-Specific Analysis', *Poetics Today,* 25:1 (2004), 70.
7   N. Katherine Hayles, *Writing Machines* (Cambridge, MA: MIT Press, 2002), p. 6.
8   Hayles, *Writing Machines*, p. 107.
9   Hayles is, of course, aware and sensitive to the work of bibliography, book history, and textual scholarship, but you get the sense from her work that she marvels at their relative marginality, at how often they can be ignored by the majority of interpretors of literature
10 E.E. Cummings, *is 5* (New York: Liveright, 1996), p. 93.
11 Robert E. Wegner, *The Poetry and Prose of E.E. Cummings* (New York: Harcourt, Brace, and World Inc., 1965), p. 142.
12 Barry A. Marks, *E.E. Cummings* (New York: Twayne Publishers, Inc., 1964), p. 101.
13 For more on the capitalisation (or not) of Cummings' name see Norman Friedman, 'Not "e.e. cummings"', *Spring*, 1 (1992), 114-121, and Norman Friedman, 'Not "e.e. cummings" REVISITED', *Spring* 5 (1996), 41-43.
14 A quotation from a poem of the same name collected in E.E. Cummings, *No Thanks* (New York: Liveright,1998), p. 3.
15 Lloyd Frankenberg, 'Introduction', *1x1*, by E.E. Cummings (London: Horizon, 1947), p. x.
16 In the poem '(fea' from E.E. Cummings, *Complete Poems* (New York: Liveright, 1994, p. 653.
17 Marks, *E.E. Cummings*, p. 101.
18 Richard S. Kennedy, 'E.E. Cummings: The Emergent Styles, 1916', *Journal of Modern Literature,* 7.2 (1979), 176-78

<http://www.jstor.org/stable/3831207> [Accessed 24 January 2010].

19 Angelo Maravita & Atsushi Iriki, 'Tools for the body (schema)', *TRENDS in Cognitive Sciences*, 8.2: (2004), 79.

20 Martin Heidegger, *Being and Time,* trans. by John Macquarrie & Edward Robinson (Malden, MA: Blackwell Publishing, 1962), p. 98.

21 For a radical philosophy emerging from an equally radical reading of Heidegger's tool analysis see Graham Harman's *Tool-Being* (Peru, IL: Open Court, 2002).

22 Heidegger, *Being and Time,* p. 99.

23 Frank R. Wilson, 1999. *The Hand* (New York: Vintage, 1999), p. 63.

24 Maravita & Iriki, 'Tools for the body (schema)', 79.

25 Maravita & Iriki, 'Tools for the body (schema)', 79.

26 Note that Japanese macaques 'rarely exhibit tool-use behaviour in their natural habitat'. Maravita & Iriki, 'Tools for the body (schema)', 79.

27 Maravita & Iriki, 'Tools for the body (schema)', 79.

28 Evidence for incorporation in human tool use, although necessarily less conclusive, supports the findings of the more invasive procedures used to study the macaques. See for instance T.A. Carlson G. Alvarez, D.A. Wu & F.A.Verstraten.. 'Rapid Assimilation of External Objects Into the Body Schema', *Psychological Science,* 21:7 (2010), 1000-1005, or Annar Berti & Francesca Frassinetti, 'When Far Becomes Near: Remapping of Space by Tool Use', *Journal of Cognitive Neuroscience* 12:3 (2000), 415-420. In the latter study a patient who suffered from near space 'neglect' in the right hand side of their field of vision following a stroke (i.e. the patient perceived nothing in their right hand field of vision which the brain would designate as being 'near' to (as opposed to 'far from') them) was nevertheless able to perceive objects perceived as 'far from' on both sides. When using a tool visible in their right hand field of vision the patient could extend the effects of their neglect to objects which became designated as 'near' due to the reach of the tool, i.e. the brain incorporated the tool to such a degree that its reach was equated with the arms reach in causing the brain to apprehend items as near or far. '[T]he tool was coded as part of the patient's hand, as in monkeys [in Maravita and Iriki's review], causing an expansion of the representation of the body schema. This affected the spatial relation between far space and the body. [...P]eripersonal space was expanded to include the far space reachable by the tool' (418).

29 Andy Clark and David J. Chalmers, 'The Extended Mind', *Analysis*, 58 (1998), 7.

30 Clark and Chalmers, 'The Extended Mind', 9. Emphasis in original.

31 Jerome J. McGann, *The Textual Condition* (Princeton: Princeton University Press, 1991), p. 13.

32 See for example David Hall *Cultures of Print: Essays in the History of the Book* (Amherst: University of Massachusetts Press, 1996); Jeffery Masten, Peter Stallybrass, and Nancy J. Vickers *Language Machines: Technologies of Literary and Cultural Production* (London: Routledge, 1997); D. F. McKenzie *Bibliography and the Sociology of Texts* (Cambridge: Cambridge University Press, 1999); Adrian Johns *The Nature of the Book: Print and Knowledge in the Making* (Chicago: University of Chicago Press, 2000); and David Finklestein and Alistair McCleery *The Book History Reader* (London: Routledge 2006). Friedrich Kittler's media theory work in *Gramaphone, Film, Typewriter*, trans. by Geoffrey Winthrop-Young and Michael Wurtz (Stanford: Stanford University Press, 1999) is also illustrative in relation to the kinaesthetics I outline here as Kittler's work marks the earliest rigorous attempt after McLuhan to theorise the capacities of modern media technology, and the interactions of bodies with that technology, for novel productions of meaning.

33 See Susan Goldin-Meadow, *Hearing Gesture: How Our Hands Help Us Think* (Cambridge MA: Harvard University Press, 2003), and Susan Goldin-Meadow, 'Talking and Thinking With Our Hands'. *Current Directions in Psychological Science* 15:1 (2006), 34-39.

34 Espen Aarseth, 'Nonlinearity and Literary Theory', in *Hyper/Text/Theory*, ed. by George Landow (Baltimore: Johns Hopkins University Press, 1994), p. 766.

35 Roland Barthes, "From Work to Text", trans. by Stephen Heath in *Image-Music-Text* (New York: Hill and Wang, 1977), pp. 155-164. See also Derek Attridge's notion of the 'event' of the text in *The Singularity of Literature* (2004).

36 E. E. Cummings, *95 Poems* (New York: Liveright, 2002), p. 1.

37 Marks, *E.E. Cummings*, p. 23.

38 Marks, *E.E. Cummings*, p. 23.

39 Iain Landles, 'An Analysis of Two Poems by E.E.Cummings', *Spring*, 10 (2001), 38 <http://www.gvsu.edu/english/cummings/issue10/Landles10.html> [Accessed 17 February 2010].

40 Marks, *E.E. Cummings*, p. 24.

41 Kirsch, Adam, 'The Rebellion of E.E. Cummings', *Harvard Magazine*, March 2005 <http://harvardmagazine.com/2005/03/the-rebellion-of-ee-cumm.html> [Accessed 24 January 2010].

42 Jonathan Safran Foer, *Tree of Codes* (London: Visual Editions, 2010).

43 Bruno Schulz, *Street of Crocodiles* (London: Penguin, 1977).

44 Tom Phillips, *A Humument* (London: Thames and Hudson, 2005).

45 W.H. Mallock, *A Human Document* (New York: Cassell, 1892).

46 See Walter Benjamin, 'The Work of Art in the Age of Mechanical
    Reproduction', trans. by Harry Zohn, in *Illuminations*, ed. by
    Hannah Arendt (Frankfurt: Suhrkamp Verlag, 1969), pp. 217-252.

47 Boris Kachka, 'Reinventing the Book: Jonathan Safran Foer's object
    of anti-technology', *New York* (21 November 2010)
    <http://nymag. com/arts/books/features/69635/> [Accessed 20 March 2011]

48 Jonathan Safran Foer, 'Jonathan Safran Foer Talks *Tree of Codes*
    and Conceptual Art', *Vanity Fair* (10 November 2010)
    <http://www. vanityfair.com/online/daily/2010/11/jonathan-safran-
    foer-talks-tree-of-codes-and-paper-art.html> [Accessed 26 January
    2011]