

Aurature at the End(s) of Electronic Literature

John Cayley, Brown University, Literary Arts

Means and ends. Within the very phrase ‘electronic literature’ its ends are implicated in its means. ‘Electronic’ refers to means in a way that is well understood but promotes quite specific means as the essential attribute of a cultural phenomenon, a phenomenon that was once new, a new kind of literature, a new teleology for literary practice, an ‘end’ of literature having its own ends, the end of electronic literature in its means, ends justified by means. This brief essay will not remain bound up within the conceptual entanglements of a name.¹ We will move on from ‘end(s)’ to means, to media, and finally — as we shall see — to medium.² We understand that ‘electronic’ in ‘electronic literature’ — now indisputably one end of a field of serious play for the theory and practice of literature — refers metonymically to computation and all its infrastructure: hardware, software, interface & interaction design, networking, and today also, since at least the mid 2000s, to a particular *de facto* historically-created world built from all of this infrastructure within which most of us now ‘live’ for a considerable portion of our lives, our cultural and, predominantly, our commercially implicated, transactional lives.

¹ I have discussed problems with the terminology of digitally mediated literary practice in a previous contribution, fully published here: Cayley, J. (2012). "Weapons of the Deconstructive Masses (WDM): Whatever Electronic Literature May or May Not Mean." *Revista de Estudos Literários* 1(2(Literatura no século XXI)): 25-56.

² This essay was first presented as a paper for the 2015 conference of the Electronic Literary Organization, University of Bergen, Norway, August 5-7, ‘The End(s) of Electronic Literature,’ and shares the conference’s concerns with the special ambiguities of the word ‘end(s).’

The existence of a particular world, or, to use a less charitable if more accurately constrained term, a regime of computation is worth recalling as we establish some context for what follows.³ One of the myths of computation is that that its artifacts are indeterminate, open, ‘free’ — configurable at the level of the individual person or, indeed, process and operation. The origin of this mythic power is the understanding that, in principle, a computer is what I have preferred, for decades now, to call a programmaton, a programmable device, the inchoate delivery and compositional hardware of programmable media.⁴ The programming in question may, in principle, be done by anyone who owns such a device and learns its code. In practice, this has had the consequence that electronic literature has been characterized by extraordinary variety and novelty at all levels of compositional form. When an author sets out to make an electronic literary artifact using a computational system, a major part of the pleasure and excitement is that of discovering some number of the virtually limitless ways in which computation and its affordances may change, inflect, modify, and even undermine or destroy existing literary forms and practices. The author is also likely to assume that this pleasure and excitement will be shared, for its own sake and regardless of traditional expectations, by the projected readers of the work. Moreover, there are critics and scholars near at hand who are willing to give unreserved positive evaluations of such work, regardless of how or even whether it’s language is read, so long as it gives actual, embodied — if media specific — form to the genii of the myth; so long as it is

³ The terminological inspiration here is Golumbia, D. (2009). *The Cultural Logic of Computation*. Cambridge, Harvard University Press.

⁴ Cayley, J. (1998). Of Programmatology. *Mute*: 72-75.

work that — formally at least — instantiates indeterminacy, openness, freedom, any and all of the new ends of literature.⁵

The problems engendered by these circumstances are substantial, enough, some might argue, to presage an end to electronic literature. Here, we must try to state the problems clearly before offering a happier ending. There is the challenge to reading. This is at least twofold. Formal bewilderment discourages reading and readers. Reading is a learned practice; it is not innate to the human animal.⁶ Asking readers to learn new forms is asking them to extend their learning rather than immediately offering them aesthetic experience. Of course, some formally innovative artifacts will be of a quality or importance that necessitates and rewards extra learning and effort. Literary culture moves on. But how will readers pick and choose amongst forms when *every* artifact is formally distinct if not entirely outside of any pre-existing formal categories? And how are they to discover any quality or importance for the language of the work if formal bewilderment makes it difficult or impossible for them to read? Secondly, there is the confusion that arises when electronic literary artifacts are esteemed by scholars and critics regardless of these artifacts' readability in terms of language. The way that computation facilitates — often via one and the same compositional platform — the

⁵ In discussions initiated by Christopher Funkhouser's intellectual repurposing of the concept of 'cultural anthropophagy' from its anti/post-colonial context to an anti/post-literary turn in electronic literature (a literature that consumes its ostensibly co-specific colonizers), Robert Simanowski has, ironically, — in his close readings of digital literary artifacts — elaborated the issue of *not* reading (the text) in electronic literature. Funkhouser, C. T. (2007). *Le(s) Mange Texte(s): Creative Cannibalism and Digital Poetry*. *E-Poetry 2007*. Paris, Université Paris8: Website, <http://epoetry.paragraphe.info/english/papers/funkhouseruk.pdf>. Simanowski, R. (2011). *Digital Art and Meaning: Reading Kinetic Poetry, Text Machines, Mapping Art, and Interactive Installations*. Minneapolis, University of Minnesota Press.

⁶ Dehaene, S. (2009). *Reading in the Brain: The Science and Evolution of a Human Invention*. New York, Viking. Hurford, J. R. (2014). *The origins of language: a slim guide*. Oxford, Oxford University Press.

introduction of other media into the work (here, I mean the plural of medium: typically visual, graphic, cinematic, sonic, musical) provides further confusion. Computation appears to offer us such articulation of recombination and structuring in respect of other media that we begin to think of their composition as events of ‘language’ in more than a merely metaphorical sense.⁷ They become literary in themselves, new ends of literature. It becomes enough, we say, to ‘read’ this new ‘language’ and less important to have read any language that happens also to have been written into the work, which language may, meanwhile, have collapsed into the visual or sonic ‘images’ of other, non-linguistic media, of light and sound.

We will return to the practice of reading because, to state it clearly, reading is constitutive of language. We may argue about how and what we read, but it is nonetheless axiomatic: no reading, no language. If there is no reading then we have reached the end of all literature, and electronic literature may have helped to get us there.

⁷ I am thinking here, primarily, of certain writings by Vilém Flusser, amongst the most sophisticated expressions of a radical post-literacy which, nonetheless, predates the development and maturation of the kind of computationally supported symbolic exchange that is available to us now (as of 2015). Flusser, polemically, suggested that literacy would give way to symbolic exchange in terms of the ‘technical image.’ However his understanding of these ‘images’ and their exchange, according to my own reading, is overdetermined by a conception of apparatus — for creating and manipulating the technical image — that has not quite obtained the degree of abstraction and indeterminacy that we now attribute to computation. If there were, indeed, a humanly implicated apparatus (such as Flusser conceived via photography and cinema) that allowed us to ‘speak’ and ‘inscribe’ with technical images, then Flusser’s end of history might come to be. However, the radical abstraction and programmability of the actual ‘apparatus’ that we have been granted, having no inherent regard for the ‘human,’ is precisely what puts the ‘technical image’ in jeopardy in so far as it might be proposed as a human end of literature. Flusser, V. (2011). *Into the universe of technical images*. Minneapolis, University of Minnesota Press. Flusser, V. (2011). *Does writing have a future?* Minneapolis, University of Minnesota Press.

Complementary problems arise when we turn to face the world that has developed, historically, culturally, to receive and sometimes publish the artifacts of electronic literature. The myth of computational media's indeterminacy, openness, freedom has become just that, still affectively powerful, but merely a story from the hyper-distant past. The actual world of computation within which we now dwell has an architecture that is as substantial and determinative as that of bricks and mortar. It may be, technically, 'softer,' but capital and power and influence — I call it Big Software — are required in equal measure — relative to the age of print — in order to effect change on a scale commensurate with, for example, urban planning, large corporate operations or, crucially, the creation and maintenance of institutions of any moment.⁸ Publishers are and will be large corporations or, if they are smaller, and even if they are individual, they will nonetheless still need to compete and transact with the larger institutions. It is now also the case in developed, networked societies, that sociopolitical frameworks for culture and practices of cultural engagement, including most literary practice, are realized within the constraints of Big Software's architectures.⁹ What this means is that the contemporary and evolving cultural practice of reading — what reading is and will become— will be determined not by the innovators of electronic literature; it will be

⁸ The crucial political economic context for this terrifying change has been signaled and set out by, amongst others, Wark, M. (2004). *A hacker manifesto*. Cambridge, Mass., Harvard University Press. Stiegler, B. (2010). *For a new critique of political economy*. Cambridge, Polity. and Golumbia (2009), already cited above. An important literature of engaged, scholarly critique surrounding these issues is slowly maturing and will be important to any of those scholars and practitioners who are anticipating the end(s) of electronic literature.

⁹ Again, there are, implicit in this statement, very serious concerns for all humanists and cultural aesthetic makers, but this essay is not the place to go into such deep problems including: the extraordinary power with respect to culture that Big Software delivers to a very few individuals and corporate institutions, some of them global; associated, ever-accelerating socioeconomic inequality in general; the overdetermination of cultural interaction by technological solutionist corporate institutions led by humanistically naive founder-(super)managers, and so on.

determined by the cultural power brokers who build and control the Big Software architecture of reading.

So, what about the avant-garde? Of course, there is always the chance that an author-innovator from the margins in which many of us dwell — from amongst the independent or institutionally patronized experimenters — will produce work in a new form and of a quality that not only demands to be read but ensures that its particular *form of reading* becomes so widely adopted and understood that Big Software is encouraged to embrace and support this new form. But until now, this has not happened in any of the ways that were envisioned by the researchers and makers of electronic literature.¹⁰

What has happened? We have ebooks. More to the point, people everywhere are reading ebooks. These inherently skeuomorphic cultural formations are nothing like what the community of electronic literary researchers and makers would want them to be. They are, nonetheless, a perfectly adequate and quite distinct platform for reading. In my own case, it is now just as likely that I will have a profound literary aesthetic experience when reading an ebook as when reading a physical book.¹¹ What do ebooks have that

¹⁰ Is Eastgate (Systems, Inc. <http://www.eastgate.com>) still the only institutional publisher of ‘serious hypertext’? I believe so. In a notable revision of his (in)famous ‘End of Books’ essay, Robert Coover, in 2008, retreated to the position that it might take 400 odd years — as it did for the modern novel — before a commensurate digitally-mediated literary form was able to develop to the point where it had attracted the effective engagement of literary practitioners. Coover, R. (1992). *The End of Books*. *New York Times*. New York. Coover, R. (2008). *A history of the future of narrative*. *Electronic Literature in Europe*. Bergen, Norway, ELMCIP.

¹¹ Quite recently, I read, with no noticeable ill effects, Ben Lerner’s *10:04* on an iPad running the Kindle app. I confess that I am more likely to have a profound literary aesthetic experience when reading an ebook than when attempting to read many works of electronic literature, although this is, in large part, because the reading experience that I associate with ‘profound literary aesthetic experience’ remains relatively conventional, whereas what I look for and appreciate in the work of electronic literature that I admire often proves to be, for me, more of a ‘profound conceptual aesthetic experience’ or sometimes a

electronic literary makers and artists might find interesting? Annotation, bookmarking, limited multimedia content, linking, ‘social’ annotation and ‘social’ reading, built-in reference tools including access to the web and translation, and perhaps other affordances I have forgotten or will mention later. Listed in this way, this seems like a not inconsiderable list of facilities, all of which, presumably, could be composed and detoured by author-makers who wished to do so. And while, for some authors and readers — including the present writer — ‘social reading’ might be perceived as a threat to human reading as presently understood, it is surely, nonetheless, a deeply radical inflection of one of our most important cultural practices.

Perhaps this essay seems about to call for something? New ends (and means) for electronic literature, perhaps? It is indeed, about to do so, clearly, but not quite so clearly, yet. I do believe that researchers and artists of electronic literature should pay more attention to the actual cultural forms — in this case, contemporary forms of delivery media for literature — that are, historically, taking the place of physical, codex-bound books. Publishers will cease to print as soon as it is feasible for them to do so. All practitioners of literary aesthetics must make themselves sensitive to the media that will constrain the composition of their work and then deliver it to readers. Within the avant-garde and amongst the independent and institutionally patronized literary artistic innovators, I also believe that greater attention should be paid to the actually existing and actually evolving culture of reading. There are examples of successful and

‘profound poetically implicated aesthetic experience.’ Recent examples include: most new work by David Jhave Johnston; Montfort, N. (2014). *#! [Shebang]*. Denver, Counterpath. Gorman, S. and D. Cannizzaro (2014). *Pry, Tender Claws*. <http://prynovella.com>.

interesting hybrid engagements. Samantha Gorman and Danny Cannizzaro's *Pry* is particularly fine.¹² Delivered by tablet, it can be understood by contemporary readers as like an ebook or, indeed, like a digital video or a sort of game, and so it will be read and watched and played. At the same time, the way that it folds gesture into the act of reading proposes a new form of aesthetic literary experience that is as profound and as well executed as anything in the electronic literary field. But will 'pry,' as gesture, for example, ever be adopted, as a form of reading, by the ebook at large? This is the type of question that the researchers and artists of electronic literature must face.

Is there something about the contemporary culture of reading, which has not so far be mentioned, and that has emerged with new significance? I believe that there is. At last we come to aurature at the end(s) of this essay. I deliberately left off one of the interesting affordances of contemporary ebooks from my previous list. Many ebooks now have companion audio versions, some of them with the ability to sync across reading platforms.¹³ Without being able, here and now, to quote hard literary sociological evidence to support this (although I am confident that my impression would be borne out), I would say, anecdotally, that there has been a significant increase in the reading of audio books over the past decade.¹⁴ They are ever cheaper to buy, much more numerous and, because of digitization and network delivery, an order of magnitude easier to acquire and manage. In the world of both popular and high literary culture,

¹² Ibid.

¹³ The 'Whispersync for Voice' service — initiated by Audible Inc. in 2012 and coordinated with Amazon's Kindle services (Amazon has owned Audible since 2008) allows sessions of visual reading — on Kindle devices and applications — to be sync'd with sessions of aural reading.

¹⁴ Audible was founded by Donald Katz in 1995. It brought out a mobile player in 1998 and was then acquired by Amazon on Jan 31, 2008 for \$300 million.

there has, therefore, been a significant increase in the appreciation of literary artifacts — in their reading, I would say — by way of aurality as opposed to visuality.¹⁵

At the same time, with the advent and persistent presence of Siri, Cortana, and Google Now, we are beginning to realize that computational terminals linked to the ‘cloud’ — and thence to the research and service infrastructures of Big Software — are now listening to us, and responding with much improved synthesized voices, beginning to approach an acceptable coherence of significance and affect in construable utterance. These voices can also be configured to read out loud from arbitrary texts of our choice on computers and other devices housing the aforementioned software agents that these same voices ventriloquize. People who nowadays encounter these vocal transactors may begin to understand some new part of what has become of all the data that they have filled in and posted, that they have willingly and much too freely given over not only to market profiling but to the solutionist research institutions of Big Software. Whereas computer voices and ‘text’ generation had remained, until quite recently, feeble, if charming, geekish jokes from the ‘AI winter,’ now many of us — I mean many non-specialists — have heard of what ‘n-grams’ may do for us and for our culture at large and

¹⁵ Interestingly, when speaking about this to a number of people who affirm that they are now ‘listening’ to more and more ‘audible’ books, I’ve found that they often consider themselves not to have ‘read’ the book when they have ‘only’ listened to it. There is much more to say about this folk phenomenological apprehension than can be dealt with here. Within the constraints of this note, suffice it to contrast the often-expressed but likely related sense that one has not read a work of literature when one has only seen a movie (or play) that has been derived from it. Clearly the cases are entirely different. Film is a distinct (multi-)medium and the text of the work in a film version may be — must be — radically edited and rearranged. In the case of unabridged audible books, one experiences the entirety and integrity of the text as language such that any prejudice against this being a ‘true’ or ‘proper’ reading of the text is a linguistic philosophical problem — related to those of linguistic materiality and ontology — and is likely to be a function of media-specific, culturally and historically implicated biases, not to put too fine a point on it.

that this is also an aspect of a widespread, ramified, and very pragmatic, commercially-invested engagement with ‘natural language processing.’¹⁶

With the prospect, in part, of being able to balance out what can only be understood as an invidious commercial overdetermination, a whole new field of technically and algorithmically implicated aesthetic language practice is opening up for just the kind of author-makers who may have been speculating about the ends of electronic literature. Perhaps we will not be able to think of this new field as, strictly, *literary* practice since its medium is language without the letter. As an applied grammatologist, I would propose that we eschew any unwarranted qualitative linguistic-philosophical distinction between writing and speech. Language is medium agnostic, although the human animal, as language co-creator, is not. Regardless, to ‘read,’ in our philosophy, is, precisely, to transmute perceptible forms — consisting of *any* material substance — into language. While — the serpent eats its tail — it is the bringing into being of language that proves to us that ‘reading’ has taken place.

How and why might the practice of a computationally implicated aurature be important, apart, that is, from helping to stave off or delay the end of electronic literature? To conclude this essay, I will simply illustrate a few points by way of example, not attempting to draw out the full implications of what is touched on in the following

¹⁶ The Google Ngram Viewer: <https://books.google.com/ngrams>. The *Science* article that launched ngrams into the Digital Humanities, Michel, J.-B., Y. K. Shen, A. Presser Aiden, A. Veres, M. K. Gray, The Google Books Team, J. P. Pickett, D. Hoiberg, D. Clancy, P. Norvig, J. Orwant, S. Pinker, M. A. Nowak and E. Lieberman Aiden (2011). "Quantitative Analysis of Culture Using Millions of Digitized Books." *Science* 331(6014): 176-182. An even more vaunting recent book: Aiden, E. and J.-B. Michel (2013). *Uncharted: Big Data as a Lens on Human Culture*. New York, Riverhead Books.

narrative. Nonetheless, the arrival of *speaking* and, especially, *listening* networked programmable devices — as a part of the technological and cultural architecture of Big Software — has, I believe, important consequences for literature and for literary — linguistic aesthetic — practices of all kinds.

After Siri and at around the same time that we were introduced to Cortana and Google Now, it became possible to invite Alexa — Amazon’s Echo — into our homes, accompanied by much-satirized advertising suggesting that she might even become a kind of family member.¹⁷ Alexa can speak and she also — most particularly — listens. If you set her up and leave her in some common room of your home she will listen to everything that she can hear within that space using an array of seven excellent microphones particularly attuned to vocal human language by ‘Far-field voice recognition.’ Triggered by her ‘wake word,’ the eponymous “Alexa,” she sends everything she subsequently hears — including “a fraction of a second of audio *before* the wake word” [my emphasis] — to the ‘cloud’ for processing by Amazon’s “Alexa Voice Services.”¹⁸ The latter is the name for a web-based infrastructure that, in addition to interpreting and responding to human invocations of Alexa herself, will provide an inexpensive service for any hardware manufacturer wanting to add voice recognition, control and vocal feedback to their devices, without having to build these technologies and services themselves. Our mobile digital familiars — especially smart phones and

¹⁷ Amazon’s main web page for the Echo, and it’s voice/persona, Alexa: <http://www.amazon.com/echo> [accessed Aug 15, 2015].

¹⁸ On what Alexa sends to the clouds, see: <https://www.amazon.com/gp/help/customer/display.html?nodeId=201602230> [accessed Aug 6, 2015] and for Alexa Voice Services, <https://developer.amazon.com/appsandservices/solutions/alexa/alexa-voice-service> [accessed Aug 6, 2015].

tablets — already surveil us extensively given our more or less silent, passive consent, but they are ours, intimate with us — they seem to be our individual business or problem. I believe that Alexa is the first device that we have invited to enter into our homes and attend to whatever occurs — that its algorithms can linguistically interpret — in these spaces that we may also share with other ostensibly private visitors and without any existing protocol for obtaining their consent to this surveillance, always assuming that this now occurs to us as any kind of a problem. And when ever more devices are enhanced and empowered by the Voice Services of Big Software? Then what? Will everything in the the world of human aurality be perfectly surveilled? Interventions will be necessary, if only to help us understand this radical transformation of the social and ideological spaces within which we must live.

Alexa can, with the Alex Skills Kit (ASK), be given new linguistic abilities in the burgeoning world of computational aurality.¹⁹ These are called ‘skills,’ and she exercises them in order to respond to what she — also in the terminology of the Kit — can interpret as vocally expressed ‘intents.’ Now, today, any of us can program Alexa to recognize and attend to arbitrary, even aesthetic, events of language that she believes to be intended for her.²⁰ And we can make her respond appropriately with utterances that humans may understand, that we can read.

Although Alexa reports her ‘birthday’ (“Alexa, how old are you?”) as her November 6, 2014 release date, I was only able to order and acquire a device as of December 19 later

¹⁹ Alexa Skills Kit, <http://developer.amazon.com/alexa> [accessed Aug 15, 2015].

²⁰ Read this as also or actually: *for Amazon*, for all the listeners of Big Software, ever hungry for culturally-formative Big Data.

that year. I responded positively to the first advertisement for the Echo that I saw, having been selected (presumably on the basis of algorithmic analyses) as amongst the members of Amazon Prime most likely to be interested in a preliminary and, it appears, experimental offering. The devices were advertised at ‘half price,’ \$99, to the customers selected, marked down from a putative \$199, and Echoes currently (as of November 6, 2015) retail for \$179.99. I outline these details for the record and to give some sense of the size of the market that Amazon may imagine for these devices. Given that the Alexa will be increasingly easy to integrate with home automation (domotic, in the terminology of Bruno Latour) systems, there must be reasonable expectation that the market will be large. As a kitchen (timing, measurement, and recipe) aid, Alexa works well. She is, of course, a fairly decent voice interface to a number of music libraries (a ‘listening and talking Bluetooth speaker’). She already ‘plays’ (evokes and controls audio recordings for) audio books and will surely, soon, be developed to read arbitrary pieces of writing (that have not been previously read and recorded by humans) as synthesized text-to-speech. She is already a widely recognized, if simple, AI, as I have mentioned, and she is also thus, of course, an ideal vehicle for the outcomes of the stronger AI research that is simultaneously regaining prominence in many fields. She is a part of what may well be the rise of ‘humanized’ social and domestic robots which are not so much invested in undertaking physical tasks (like those of factory robots) or activities that are dependent on calculated movement. Alexa and her like are focused on information management and interrelation, including transaction with and on behalf of those humans that such robots can sense and identify.²¹

²¹ Jibo.com has raised \$3,714,505 on Indiegogo for the “the world’s first social robot for the home.” (Site accessed, Nov 20, 2015, displaying the Indiegogo figure.) If there is a ‘first’ in this category, the Echo and Alexa have a convincing claim.

The current wide-spread usage of the word ‘robot’ is indicative of a significant shift in our understanding of artificial intelligence. The developed-world imaginary surrounding robots had, until quite recently, embodied them in humanoid forms, with the robots’ artificial intelligences inhabiting these bodies in a parody or folk version of Cartesian dualism. Alan Turing disembodied AI but insisted on its relation with socialization and with aspects of identity — such as gender — that culture and theory now characterizes as *constructed*.²² Today ‘robots’ exist on the Internet, in the cloud, and as distributed chiefly to our mobile devices. Thanks to the new Apple TV, we are about to discover that they have also been widely distributed to our televisions, or rather, to our home entertainment systems.²³ The Amazon Echo — Alexa — is, in a sense, the first plausible re-embodiment of the domestic robot. And we will, I predict, soon discover that Siri is embodied in our televisions.

An important question that I want to ask here — in a context that engages with aesthetic linguistic practice — is this: given that neither Alexa nor our soon-to-be-robot televisions are humanoid, then why is that we think of them as robots? The answer, of course, is that they make use of human language. Use of language was the reason that we changed our understanding of ‘robot’ in the first place. Robots, on the internet, are programs that use human language or linguistically framed events to perform transactions, with one another and also with and on behalf of actual humans. Robots read your email and compose ads for you based on what they’ve read. They write, that is,

²² See the prologue, xi-xii, of Hayles, N. K. (1999). *How we became posthuman: virtual bodies in cybernetics, literature, and informatics*. Chicago, University of Chicago Press.

²³ ‘Siri Remote,’ see <http://www.apple.com/tv/> (accessed Nov 20, 2015).

they generate spam. They build websites to redirect your attention. They try to log into your bank account. They tweet. They set puzzles for you, attempting to find out if you are one them or one of us. Because all these transactions are framed by language and because they model linguistically structured human agency, they qualify as the actions of robots. In everyday life they provide us with encounters which, to date, are those experiences closer than anything else we can imagine as actual encounters with robots. This is why the robot imaginary changed.

Now, Alexa, stands (or sits) independently, apart of any one of us, in her own body. Crucially, she is able to perform most or all of the robot-like actions and transactions that are carried out by her internet-based forebears. She's connected to them — so-called 'socially' — and she uses language in the way that they do. Even more crucially, catastrophically, moreover, *Alex has a voice*, a good one, with its own timbre and its powerful suggestion of specific human identity. Siri, or the Siri's, rather, with their many possible voices and languages, listening and speaking from our televisions at first, will have all the characteristics and the same quasi-independent standing as Alexa.

Alexa is, for all these reasons, important for the future of language art. She is, I believe, the first robot *whom* I think and feel I have invited into my home. She suggests to me that some major proportion of the art of language will be made in new world where the material support for linguistic practice will be as much aurature as it is now literature. The voices of artificial entities can be composed as aurature, and in media that are widely distributable. Computation and programmability — software — will be more or less necessary for any composition of this aurature. It will attain the culture significance

of literature simply because so much non-aesthetic, everyday transaction will also and in the first place migrate to aurature. This will bring about the final the end of electronic *literature*. Happily, taking materially distinct practices of 'writing' and 'reading' along with them (writing and reading will enfold all the various practices for the generation and receptive interpretation of aurature) many language artists will intervene and aestheticize an aurature that might otherwise be constrained and control by vectoralist commercialism and Big Data, Big Software solutionism.

In a companion to this essay, I describe my own first attempt to make a work of aurature, *The Listeners*, for the Amazon Echo and Alexa, with a commentary intended to address as many of these points and speculations as possible.

Bibliography

Aiden, E. and J.-B. Michel (2013). *Uncharted: Big Data as a Lens on Human Culture*.

New York, Riverhead Books.

Cayley, J. (1998). Of Programmatology. *Mute*: 72-75.

Cayley, J. (2012). "Weapons of the Deconstructive Masses (WDM): Whatever Electronic Literature May or May Not Mean." *Revista de Estudos Literários* 1(2(*Literatura no século XXI*)): 25-56.

Coover, R. (1992). The End of Books. *New York Times*. New York.

Coover, R. (2008). A history of the future of narrative. *Electronic Literature in Europe*. Bergen, Norway, ELMCIP.

Dehaene, S. (2009). *Reading in the Brain: The Science and Evolution of a Human Invention*. New York, Viking.

Flusser, V. (2011). *Does writing have a future?* Minneapolis, University of Minnesota Press.

Flusser, V. (2011). *Into the universe of technical images*. Minneapolis, University of Minnesota Press.

Funkhouser, C. T. (2007). Le(s) Mange Texte(s): Creative Cannibalism and Digital Poetry. *E-Poetry 2007*. Paris, Université Paris8: Website, <http://epoetry.paragraphe.info/english/papers/funkhouseruk.pdf>.

Golumbia, D. (2009). *The Cultural Logic of Computation*. Cambridge, Harvard University Press.

Gorman, S. and D. Cannizzaro (2014). *Pry, Tender Claws*.

- Hayles, N. K. (1999). *How we became posthuman: virtual bodies in cybernetics, literature, and informatics*. Chicago, University of Chicago Press.
- Hurford, J. R. (2014). *The origins of language: a slim guide*. Oxford, Oxford University Press.
- Michel, J.-B., Y. K. Shen, A. Presser Aiden, A. Veres, M. K. Gray, The Google Books Team, J. P. Pickett, D. Hoiberg, D. Clancy, P. Norvig, J. Orwant, S. Pinker, M. A. Nowak and E. Lieberman Aiden (2011). "Quantitative Analysis of Culture Using Millions of Digitized Books." *Science* **331**(6014): 176-182.
- Montfort, N. (2014). *#! [Shebang]*. Denver, Counterpath.
- Simanowski, R. (2011). *Digital Art and Meaning: Reading Kinetic Poetry, Text Machines, Mapping Art, and Interactive Installations*. Minneapolis, University of Minnesota Press.
- Stiegler, B. (2010). *For a new critique of political economy*. Cambridge, Polity.
- Wark, M. (2004). *A hacker manifesto*. Cambridge, Mass., Harvard University Press.