



IMMATERIALITY OF THE WORK VS. MATERIALITY OF THE BODY?

DIGITAL LITERATURE

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ABSTRACT *This article shows how digital literature thinks about and works with the body of the reader in a time when the dominating role of the immaterial is more and more questioned. Digital texts play with their immateriality and their seemingly purely intellectual perception by making it their subject and pointing to their material environment, including the reader's body. Works by Serge Bouchardon, Shelley Jackson, Annie Abrahams and others show that it has become impossible to separate between the 'traditional' and the 'technological' reading experience insofar as through them, we experience not only the machine and/or our body, but both—while they are inseparably joined in a network or device out of which new possibilities of use and experience arise.*

KEYWORDS *Materiality, Immateriality, Digital Literature, Textuality, Materialisation, Body, Gesture, Serge Bouchardon, Shelley Jackson, Annie Abrahams.*

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The *Les Immatériaux*¹ exhibition in 1985 is still a landmark event, both for the contemporary research around new media art that it highlighted and for the conceptual significance that it had. This ‘immaterial’ approach to the digital arts may seem obvious: digital literature is *immaterial* since the way in which it is produced relies essentially on coding. However, there is little doubt that this *dematerialisation* of data² plays a less important role in the user’s consciousness than their perception of the transience of the medium—which soon becomes useless (*i. e.* damaged or outmoded) or is entirely virtual (the *cloud*)—and the fragility of the data stored on it. This ephemeral nature, albeit it is being increasingly mastered, is a central element of the digital imaginary. It is also undoubtedly the most harrowing element for modern societies, who have constructed their histories upon the traces that have been left behind. It is a fact that there is no guarantee digital technology will leave any trace. This is particularly true for books and literature: not only is there the risk that a work may disappear through a technological fault, but there may also very often be no record of its genesis. This phenomenon—combated in part by software with reviewing functionalities or simply by our habit of saving successive versions—is not always seen as a negative and often induces new writing habits. For John Cage, for example, using a computer to write

does completely change your mind. When you write a text as I used to write with all the crossings out and everything, you have a picture of the past along with the present and you develop a maze. With the word processor you have only the present so that you’re really in a new mental land³.

The loss of the manuscript is nevertheless often likened to a form of dematerialisation. With its loss, not only does the record of an evolving thought disappear (rough drafts, crossings out), but so also does the rhythm of a gesture, of the writing body. We are talking about the disappearance of writing [*inscription*], that is to say, of the materiality and action on the material: ‘digital literature implies the disappearance of any trace left behind’ [*la littérature numérique signifie la disparition de la trace*] (Malbreil 2006: 169).

This awareness of dematerialisation also stems from the virtual experience. It is, of course, all about the ability to create other worlds: games and digital fiction simulate an environment, whether real or imaginary, in interaction with human

1 The *Les Immatériaux* exhibition ran from 28 March to 15 July 1985 at the Pompidou Centre in Paris under the direction of Thierry Chaput and Jean-François Lyotard.

2 It should be noted that the human and social sciences are starting to take an interest in the ecological cost of digital technology, highlighting the material pollution of a technology that is ostensibly immaterial. See, for example, the French publication *Les Impacts écologiques des Technologies de l’Information et de la Communication* (2012).

3 John Cage (1985) in an interview with Deborah Campana, cited by Kostelanetz (2003). Xavier Malbreil also notes, in “Écrire sur un clavier est une contrainte” (2006), how these practices put the text ‘at a distance’, creating an effect of strangeness.

beings, interweaving the virtual with reality. However, the virtual nature of the work, which only materialises when actualised by the machine, also has to be taken into account. Some artists highlight this process, most notably by displaying the metamorphic and ‘potential’⁴ nature of the work through an exploration of permutations, variations or automatic random generation methods, which regenerate every time the programme or machine is started up.

Nevertheless, the central role of ‘the immaterial’ is now increasingly being called into question, both by theorists (who most notably draw on Espen Aarseth’s ergodic theory [1997], which emphasises the materiality of cybertext) and by artists. The issues focused on in the *BOOK—MATERIAL—TEXT* workshop provide an opportunity to show, alongside the question of the dematerialisation of the book and text, that calling this analysis into question results, in particular, in a ‘return’ of the material or, in this case, the body. Whether it is threatened with a ‘loss of material’ or, on the contrary, summoned to offset ‘the immateriality’ of the digital work, this ‘return of the body’ prompts the hypothesis that, in the words of Jean-Pierre Bobillot, ‘the more we are surrounded by the virtual, the greater our need for real presence becomes’ [*plus il y a du virtuel, plus il faut de la présence réelle*] (Bobillot 2008).

NEW MODES OF MATERIALISATION

It should be noted from the outset that this ‘immaterial’ approach to the digital work has to be qualified. First of all, it is relative to what is felt in the experience. The reader has, for example, a strong awareness of the materiality of the machine. Independently even of the new writing or reading constraints, the computer is not perceived as being less material than the book, particularly since the reader rarely seems to be aware of the programme that supports the ‘material’ text they are reading. The screen can therefore be considered the new materiality of the digital work, where each production is a materialisation. Likewise, the reader is aware of belonging to a ‘network’, which, in order to be immaterial, is never experienced as virtual.

Moreover, as Alexandra Saemmer highlighted, the digital work is represented by a ‘textual material’ [*matière textuelle*] (Saemmer 2007). It is worth mentioning the close link that exists between visual poetry, particularly concrete poetry, and animated poetry. While the written work is dematerialised, the writing is able to choose the ‘matteric’ way—plays on letters, words, typography, spatialisation—as introduced by the historical avant-garde. In the digital work, however, the ‘material’ is also expressed through the possibility, both for the writer and sometimes

4 This term is used most notably by a group called Oulipo (*Ouvroir de littérature potentielle* – Potential Literature Workshop) and is defined by Raymond Queneau in “Littérature potentielle” [1964].

also for the reader, of intervening in the text. Serge Bouchardon, who also takes an opposing view to the approaches that prevailed in the second half of the 20th Century, even suggests talking about ‘the aesthetics of materiality’ (Bouchardon 2008b). He differentiates between the materiality of the text (which responds to the reader’s actions), the materiality of the interface (what he calls ‘material figures’, for example, the ‘windows’) and the materiality of the medium (some authors play with this, for example Annie Abrahams, when she asks readers to turn their computer screens off and then on again so that they see their own reflections in the screen) (Bouchardon 2009: 224 sq.).

Other characteristics reinforce this ‘textual material’ approach to digital literature. The process of updating, for example, also reiterates the question of materiality. Ambroise Barras showed that the principle of ‘quantity’, used by Walter Benjamin to criticise ‘technical reproducibility’ (‘quantity has been transmuted into quality’ [Benjamin 1935/1936, XV]), has been incorporated by digital artists (Barras 1997). It could also be said that the new place of temporality in a work turns it into a *phenomenon* (this is conveyed in the name of the group *Transitoire observable*⁵). The digital text is subject to motion and transformation. It is to be seen and ‘observed’ as much as (and sometimes more than) it is to be read. The materiality of the digital text stems from its dynamic character, and this is the notion that is at the heart of Saemmer’s and Bouchardon’s studies.

The immateriality of the digital work seems therefore to speak more to the imagination than to pertain to a digital literature experience. This hypothesis will be addressed by examining the relationship between this immateriality, real or constructed, and the body. To what extent does the body respond to immateriality? To what extent does immateriality affect the body?

THE BODY AS A THEME

The first thing to note is that many works take the body as a subject. A number of titles testify to this, including *Future Body* by Tina LaPorta in 1999, *Possible Bodies: ce que peut un corps* by Grégory Chatonsky in 2002 and *My Google Body* by Gérard Dalmon in 2003. They conjure up a body *to be*, a changing one, which is transformed by its relationship to its technological environment. For many artists, this confrontation with technology effects a disincarnation in the sense that thought and action become separated from the body. Naturally, this is an impression that becomes stronger as awareness of virtuality and distance increases. It is possible, for example, to experience a far-off space without ever leaving our arm-chairs (using *Google Maps* images to journey, for instance) or a three-dimensional

5 *Transitoire observable* [Observable Transient] is the name of a group of French digital artists, founded in 2003 by Philippe Bootz, Alexandre Gherban and Tibor Papp: <http://transitoireobs.free.fr/to/>.

space that does not even exist. We have the ability to perceive without engaging our bodies. Virtual worlds may, according to Friedrich W. Block, produce 'a wholly spiritualised recipient' [*der völlig vergeistigte Rezipient*] (Block 1998, 2000: 84) – a participant confined to their intellect. It should be noted, however, that this breakdown between perception and sensation is not just a characteristic of digital technology, but of distance communication technologies more generally. Photography, cinema and particularly voice technologies were the initiators of this experience, which Kafka said, in a letter to Milena in March 1922, resulted in the disappearance of the 'ghostliness' between human beings. Tina LaPorta explains, for example, that *Future Body* was

a web specific work which explores the disembodied and dislocated nature of on-line subjectivity [...] the separation of the corporeal world implied by the use of telecommunications technology (LaPorta 1999: 224)

The idea that technology constitutes a threat to the integrity of the living is not a new one. The figure of the automaton in fiction introduced us to the harrowing separation of the soul and the body. However, the loss of unity now affects the body itself. Manipulated and broken up, it is like Frankenstein's creature, which continues to haunt many contemporary works (*Patchwork Girl* by Shelley Jackson⁶ or *F. aime F.* by Gilles Dumoulin). Sometimes, it runs counter to this figure, since the body is now disjointed and composed of interchangeable parts. In Gérard Dalmon's *My Google Body* (2003), where a generator is constantly replacing some body part or other with images (including metaphors) extracted in real time from *Google*, we notice the transition from a patchwork or puzzle, which ends up forming a whole, to the *dissecta membra* of a figure that is perpetually evolving, (de)formed by the flow of images that continuously pass over it. The body, seized by immateriality, simultaneously loses its substance and power.⁷

Conversely, the return of the body can be organised around a sensuous (and sometimes sensual) paradoxical experience, which the following titles also clearly show: *Touch me! Don't touch me* by Annie Abrahams (2003), *Touch/Toucher* (2009) or *Loss of Grasp / Déprise* (2010) by Serge Bouchardon, *The Worldgenerator/The Engine of Desire* by Bill Seaman and Gideon May (1996–) and *The Thoughtbody Environment* by Bill Seaman (2005). Various issues are concealed behind these titles. In some works, the appeal to the senses seems to have to show, ironically, how illusory human relationships that have been turned into media events by the

6 This work has been analysed by George P. Landow (1997) and Samuel Archibald (2009), among others.

7 This is similar to postmodern reading, which focuses on the dissolution of identity, accelerated by digital technology. George Landow speaks, for example, (in a chapter about 'Reconfiguring the Author', but generalisable to other matters) of the 'Erosion of the Self' [Landow 1992, 1997: 90].

machine are. Others, in contrast, use this experience with the aim of broadening people's perceptions. In both cases, however, the real body is engaged, aroused by several perceptions at once (this is the principle of multimedia works), but also prompted to manipulate the machine or to take a stroll alongside/inside it. In this case, the real body confers a materiality on the work, not only because it allows it to be produced, but also because it becomes one of the materials within it and, according to Friedrich W. Block, one of the 'signifiers' (Block 1998, 2000: 81). Mario Costa sees in this the main illusion associated with 'neotechnology', which 'seems to extend the body but in reality [...] renders it increasingly external to itself and increasingly just one object among many' [translated from the French] (Costa 2003: 117 and 123).

A PHYSICAL READING

A second approach focuses on the place of the body in the reading activity. Far from being disembodied, the reader of a digital work is often required to participate physically (characteristic of hypermedias, in particular). There is no doubt that digital literature requires a greater physical presence than any other form of reading. This gives rise, incidentally, to a practical difficulty: the body effectively makes a return, insofar as it manifests itself through tiredness or pain, and tests its relationship to the machine under constraint.

In the same vein, we should mention interactivity, which is undoubtedly the most frequently discussed of digital experiences and the one that is most readily associated with computers. Whether real (technical) or illusory (a process), interactivity involves a physical intervention in the reading, which Serge Bouchardon divides into three modes: navigation, manipulation and the introduction of data (Bouchardon 2008-1 and 2009: 146). This type of work, designed to be manipulated (it 'expects an action from the reader', says Bouchardon, 2009: 172), imposes a truly 'incarnate' reading. Neologisms, in the form of blends, have emerged to account for this new method of intervention, such as *wreader* in English and *écrivlecteur* or *lectacteur* in French.

More generally, many authors attempt to recreate a 'materiality' from the reading activity by forcing the reader, through renewed, although sometimes uncomfortable, reading situations, to become aware of their activity. This is what Annie Abrahams does with great humour in *Separation/Séparation* (2001–2003), by regularly interrupting her reader with signs explaining how to read or how to relax. This approach often consists in attempting to extend the methods of interaction beyond just one click by imposing what Carrie Noland calls 'digital gestures' (Noland n.d.). Philippe Bootz and Serge Bouchardon, for example, both lead the reader into a sensuous experience, where the gesture of reading becomes a caress. Natalie Bookchin and Jason Nelson seek out new gestures from games. Jeffrey

Shaw and Dirk Groeneveld, Eduardo Kac and Jean-Pierre Balpe explore modes of spatialisation in the reading activity. This includes the possibility of moving around the work to make sense of its variations, as with Kac's or Richard Kostelanetz's holopoetry, which, according to Jacques Donguy, allows a 'spatial experience of language' (Donguy 2007: 300). Another example is the route, whether virtual or real, through a space that is saturated with text (Shaw and Groeneveld; Balpe). Confronted with a text conceived as 'plastic' (Saemmer 2007: 42), the reader is thus truly encouraged to read with their body. In a chapter justifiably entitled 'Incarnation' [*Verkörperung*], Friedrich W. Block speaks of 'shifting syntax' [*Syntax des Changierens*] (Block 1998, 2000: 82) and notes in this respect that 'the textual space is not just inhabited; through the user's activity, it is also incarnate' [*Der Textraum wird nicht nur belebt, sondern durch die Aktivität der Benutzer auch belebt.*] (Block 1998, 2000: 81).

A REFLECTION ON IMMERSION

At least a third approach draws on cognition and immersion theories. The digital tool, in its multimedia dimension, allows us to construct a virtual space composed of texts, images and noises in which the body is actively engaged, even in situations where it is apparently passive. The appeal to several senses at once is not a feature that is specific to digital technology. However, the multimedia device through which the boundary between different modes of expression becomes extremely unstable has the ability to transform the spectator into a 'spect-actor'. It creates a synthetic, mediologic complex, which Dick Higgins, in 1966, suggested calling 'intermedia' (to distinguish it from multimedia, which juxtapose one another).

Some authors pursue this work on perceptions through 'live actions'⁸ by offering a physical experience of walking around or of immersion. This is what was proposed, for example, in Jeremy Hight, Jeff Knowlton and Naomi Spellmann's 2002 *34 North 118 West*, where participants were able to hear stories about different locations in Los Angeles as a GPS system guided them towards the spot. Likewise, Jean-Pierre Balpe's 2005 *Fiction d'Issy* was an interactive, generative story, played out in urban space using text messages, electronic signs in the town and website displays. In 2002, Balpe, Jacobo Baboni Schiligi and Miguel Chevalier developed *MeTapolis*, an interactive, generative virtual reality installation, where the 'reader' was immersed in a 300 square metre visual, acoustic space (two- and three-dimensional images, spatialised sound), which he or she was encouraged to move into. Bill Seaman also produced works where 'meaning is experienced through sensual interaction in a virtual environment' (Seaman 2004: 237), in the

8 Like the 'live action role playing game' (or LARP), where players physically take on a character.

same way that it is in a real environment. Defending the idea that our thoughts are influenced by our perceptions, he sought, with *The Thoughtbody Environment* (2005), for example, to make us feel the unity of the body and spirit. For others, these immersion processes aim to give us an awareness of the incorporation of the being in space (this is the concept of the ‘Embodied Being’ put forward by Char Davies in *Osmose* in 1995). While space is presented for us to make sense of it through an experience requiring the whole body (gestures, movements, perceptions, sensations), it also therefore simultaneously becomes an interface.

We are prompted to ‘gesticulate’, move around and immerse ourselves. While it is obviously paradoxical—but interesting from the imaginary point of view—to create such a sensuous relationship with a machine, the call for a ‘sensual experimentation’ (Saemmer 2007: 58) undoubtedly brings a materiality to the reading activity, which then truly becomes an experience, an act that is like a performance.

TOWARDS AN ‘ENHANCED’ BODY?

If the ‘return of the body’ can express the anxiety that comes from the awareness of immateriality, conveyed most notably by the persistence of the imaginary of fragmentation, another approach is therefore to focus on digital intermediality and, to a lesser extent, on interactivity in order to develop the interaction of the body, the spirit and their environment.

The reflection required to extend the act of reading and, more broadly, the modes of producing meaning is one of the manifestations of this ‘new alliance’. The desire to give the reader an awareness of the reading (or perception) process to prevent them from being a simple ‘consumer’ is certainly one of the characteristics of the experimental approach generally. However, the aim here is less to make the reader aware of the language or ideology underpinning the literature than to lead them into a construction that requires total participation, both intellectual and sensory.⁹ This is what Bill Seaman called ‘Recombinant Poetics’ (Seaman¹⁰ 2004: 231), ‘a form of active looking/listening/interacting/understanding’ (Seaman 2004: 229) within an evolving technological environment:

The computer facilitates [...] new forms of ‘inscription’. It enables us to explore an extended multi-dimensional space, a virtual space that includes a collection of varying

9 It should be noted, however, that this type of experimentation seems to accompany any reflection on the medium. Hence, ‘tactilism’ was one of the avenues explored by Marinetti as a way of escaping from the book. In the same vein, Raoul Hausmann defined ‘optophoneticism’ as ‘the cybernetics between vision and hearing’, which engages the whole body.

10 This was also the title of Seaman’s thesis: ‘Recombinant Poetics: Emergent Meaning as Examined and Explored Within a Specific Generative Virtual Environment’ (1999).

media-elements. The 'performative' nature of this environment enables the construction of emergent meaning, where poetic construction is performed. (Seaman 2004: 231 and 233)

The aim here is no longer just to use action to help us understand the work or the artistic process, but to defend a cognitive approach where the intellect and our perceptions are jointly summoned to construct meaning or, rather, to make it 'emerge'. It will be clear that this involves a radical change in the way in which the reader is conceived. They no longer have to strive towards being the 'ideal reader', but must instead physically have an effect on the work: 'Your gestures make my words meaningful', said Serge Bouchardon in *Mes Mots/My Words* (2008).

All of these works continue, therefore, to question the relationships between human beings and the machine. For a number of artists, it is a matter of exploring and constructing new relational modes, where the computer is conceived as an 'enhancement', extension or supplement of the body. Espen Aarseth referred, in 1997, to the figure of the cyborg when describing the new relationship between the reader and the text. For the Australian artist Stelarc, 'the human body is somewhat obsolete' (Stelarc 1995) and, according to Eric Sadin, the body is not a medium, but an interface that incorporates the technology to achieve an 'extended corporeality' [*corporéité étendue*] (Sadin 2011: 14 and 39). Hence, technology allows us to reveal or improve the skills that our bodies ignore or underutilise.

Conversely, some artists consider the body to be the medium and the computer to be 'just one meaning-force-exchange mechanism in the landscape of living exchange' (Seaman 2004: 229). For Annie Abrahams, 'our body is the surface through which the machine has access to reality'¹¹ [*notre corps est la surface par laquelle la machine a accès au réel*] (Abrahams *et al.* 2008). This is very similar to the remark made by Jay David Bolter, who said that 'The immediate perception of the world is not open to the computer' (Bolter 1991: 224¹²). Human beings will, therefore, come to compensate the computer's shortcoming. Abrahams expressed this notion humorously when she wrote, 'Human beings are the sexual organs of the machine' [*Les êtres humains sont les organes sexuelles [sic] de la machine*] (Abrahams *et al.* 2008).

We might therefore subscribe to Mario Costa's explanation:

11 Abrahams explains that she is quoting Ollivier Dyens in 'The Emotion of Cyberspace: Art and Cyber-ecology', *Leonardo*, Vol. 27, no.4 (1994), p. 327–334: "our body is the screen (the signifying surface) by which the machine has access to reality" (p. 328). See: <http://www.bram.org/txt/indexuqam.html>.

12 However, he saw in this shortcoming that 'The digital computer reconfirms the dichotomy between perception and semiosis as two aspects of mind, and it comes down firmly on the side of semiosis' (Bolter 1991: 224).

Technology has transformed the notion of the body. What was once considered ‘already given’ and ‘irreplaceably-given’ has become just one more territory over which technology exerts its power. Technology becomes more and more internalised while the body becomes increasingly externalised. [...] It is not just the notion of the body that technology changes, however, it changes the whole range of human experience [...]. Neotechnology appears to ‘extend’ the body, but in reality it renders it increasingly external to itself and increasingly just one object among many. [translated from the French] (Costa 2002, 2003: 117 and 123)

We would want to qualify the pessimistic note that it ends on, however. For Friedrich W. Block, on the other hand, this evolution leads to a distancing effect, which clearly enables the ‘reincarnation’ [*Reinkarnation*] of the subject that post-modernity had made disappear (Block 1998: 86). Finally, the response from some of the works mentioned above is different again: the return of the ‘material’ seems to want to express the belief that the body is never purely ‘organic’ or isolated, but that it is part of a device (this is one of the aspects, for example, that Donna Haraway’s ‘Cyborg Manifesto’ highlights) from which new representations and uses emerge.

WORKS CITED

- Abrahams, Annie. *Touch me/Don't touch me* (2003). <<http://www.bram.org/toucher/>>.
- . *Separation/Séparation* (2001–2003). <http://collection.eliterature.org/2/works/abrahams_separation/separation/indexfr.htm>.
- et al. (writing workshop). ‘Notre corps est la surface par laquelle la machine à accès au réel’ (2008). <<http://www.bram.org/txt/indexuqam.html>> <<http://www.bram.org/txt/corps/index.htm>>.
- et al. (writing workshop). ‘Les êtres humains sont les organes sexuelles [*sic*] de la machine’ (2009). <<http://bram.org/textdynamics/cnes/index.htm>>.
- Baboni Schiligi, Jacobo, Jean-Pierre Balpe, and Miguel Chevalier. *Me Tapolis* (2002). Technical information available at: <<http://www.ciren.org/ciren/productions/metapolis/index.html>>.
- Balpe, Jean-Pierre. *Fiction d'Issy* (2005). Technical information available at [if the link is not working, go to the *Le Cube* website and use the site's internal search engine]: <<http://www.lesiteducube.com/atelier/jeanpierrebalpe-fictiondissy.html>>.
- Bookchin, Natalie. *The Intruder* (1999). <<http://bookchin.net/intruder/>>.
- Bootz, Philippe. *petits poèmes à lecture inconfortable* (series of works involving a pronounced and repeated gesture to reveal or transform the text). <http://epoetry.paragraphe.info/artists/oeuvres/bootz/bootz_index.htm>.
- Bouchardon, Serge. *Loss of Grasp/Déprise* (2010). <<http://www.lossofgrasp.com>>.
- , Cyril Boitel, and Etienne Monier. *Mes Mots/My Words* (2008–). <<http://www.mes-mots.com/>>.
- , Kevin Carpentier, and Stéphanie Spénlé. *Touch/Toucher* (2009). <http://collection.eliterature.org/2/works/bouchardon_toucher/index.html>.

- Chatonsky, Grégory. *Possible Bodies: ce que peut un corps* (2002). <<http://chatonsky.net/project/possible-bodies/>>.
- Dalmon, Gérard. *My Google Body* (2003–). <<http://www.neogeo.com/googlebody/init.html>>.
- Davies, Char. *Osmose* (1995). <<http://www.immersence.com/osmose/>>.
- Dumoulin, Gilles. *F. aime F. (Journal de Frankenstein) d'après Mary Shelley* (2002–2003). <<http://tapin.free.fr/frankensteincadre.htm>>.
- High, Jeremy, Jeff Knowlton, and Naomi Spellmann. *34 North 118 West* (2002). Presentation and videos available at: <<http://34n118w.net/34N/>>.
- Jackson, Shelley. *Patchwork Girl*. Eastgate, 1995. Extracts available at: <<https://www.youtube.com/watch?v=KXFEqYXrbqU>>.
- Kac, Eduardo. *Adhuc* (1991). Photographs available at: <<http://www.ekac.org/allholopoems.html>>.
- Laporta, Tina. *Future Body* (1999). One version available at: <<http://www.paperveins.org/futurebody/>> <<http://users.rcn.com/laporta.interport/futurebody.html#sthash.O228mlR4.dpuf>> (link no longer available?).
- Nelson, Jason. *Game, game, game and again game* (2007?). <<http://www.secrettechnology.com>>.
- Seaman, Bill. *The Thoughtbody Environment* (2005). Available on his website: <<http://billseaman.com>>.
- Seaman, Bill, and Gideon May. *The Worldgenerator/The Engine of Desire* (1996–).
- Shaw, Jeffrey, and Dick Groeneveld. *Legible City* (1988–). Photographs and videos: <http://www.jeffrey-shaw.net/html_main/frameset-works.php>.

REFERENCES

- Groupe EcoInfo. *Les Impacts écologiques des Technologies de l'Information et de la Communication*. EDP sciences, 2012.
- Aarseth, Espen. *Cybertext. Perspectives on Ergodic Literature*. Baltimore & London: The Johns Hopkins University Press, 1997.
- Archibald, Samuel. *Le Texte et la technique. La lecture à l'heure des médias numériques*. Montréal: Le Quartanier, 2009.
- Barras, Ambroise. “Quantité/Qualité: trois points de vue sur les générateurs automatiques de textes littéraires”. *Frontenac* (Kingston, ON, Queen's University) 14 (1997–1998) 6–15. <<http://latlculi.unige.ch/framo/articles/consultation/article.php?id=20>>.
- Benjamin, Walter. *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit, 1935/1939; The Work of Art in the Age of Mechanical Reproduction*. Available at: <<http://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm>>.
- Block, Friedrich W. “Literatur in der Informationsgesellschaft” [1998]. *Elektronische Literatur*. Ed. Timo Kozłowski and Oliver Jahraus. Universität Bamberg: coll. ‘Fußnoten zur Literatur’, 2000.
- Bobillot, Jean-Pierre. *Trois leçons de poésie. Du bru(i)t dans la pointCom*, a Jean-Pierre Bobillot and Camille Olivier film, 2006, 2008. <<http://www.youtube.com/watch?v=yIcxSz33c2w>> and <<http://www.youtube.com/watch?v=dwxjgXwALn4&feature=related>>.
- Bolter, Jay David. *Writing space. The Computer, Hypertext, and the History of Writing*, Hillsdale, N.J.: LEA, 1991.

- Bouchardon, Serge. "Towards an art of rhetoric in interactive literary works". *ELO Conference 2008*, Vancouver, Washington state (EU) [2008a]. <<http://www.utc.fr/~bouchard/articles/Bouchardon-ELO-paper.pdf>>.
- . "The aesthetics of materiality in electronic literature", "Electronic Literature in Europe" Seminar, University of Bergen, Norway, 13 September 2008 [2008b]. <https://www.academia.edu/343106/The_aesthetics_of_materiality_in_electronic_literature>.
- . *Littérature numérique. Le récit interactif*. Paris: Hermès Lavoisier, 2009.
- , and Asunción López-Varela Azcárate. "Making Sense of the Digital as Embodied Experience", *New Perspectives on Material Culture and Intermedial Practice*. Ed. Steven Tötösy de Zepetnek, Asunción López-Varela Azcárate, Haun Saussy and Jan Mieszkowski, *CLCWeb: Comparative Literature and Culture* (Purdue University), 13.3 (September 2011).
- Costa, Mario. *Internet e globalizzazione estetica*, Napoli, Tempo lungo, 2002. Trans. Giordano Di Nicola. *Internet et globalisation esthétique. L'avenir de l'art et de la philosophie à l'époque des réseaux*. Paris: L'Harmattan, 2003.
- Donguy, Jacques. *Poésies expérimentales—Zone numérique (1953–2007)*. Dijon: Les presses du réel, collection 'L'écart absolu', 2007.
- Haraway, Donna. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century". *Simians, Cyborgs and Women: The Reinvention of Nature*. New York: Routledge, 1991. 149–181.
- Higgins, Dick. "Intermedia". *Something Else Newsletter* (New York) 1, 1 (February 1966).
- Kostelanetz, Richard. *Conversing with Cage*. New York: Limelight, 1987. New York: Routledge, 2003.
- Krzywkowski, Isabelle. "e-poésie: la machine comme nouvel outil de création". *Atala* (Rennes) 10, *Sciences et techniques* (March 2007): 195–206.
- . "Lire la e-poésie: nouveau support, nouveaux modes de lecture?". *Lecteur, lectrices, théories et fictions*, Ed. S. Hubier and A. Trouvé, *Revue d'études culturelles* (Dijon) 3 (2008): 123–132.
- Landow, George P. *Hypertext: The Convergence of Contemporary Critical Theory and Technology*, Baltimore: Johns Hopkins University Press, 1992. Rev. 1997 under the title *Hypertext 2.0*.
- LaPorta, Tina. 'Future-body'. *Un nôtre web. Doc(k)s* 21/22/23/24 (1999).
- Malbreil, Xavier. "Écrire sur un clavier est une contrainte". *Littérature numérique et cætera*. Ed. Serge Bouchardon, Eduardo Kac, Jean-Pierre Balpe, *Formules. Revue des littératures à contraintes*. 10 (June 2006): 161–170.
- Noland, Carrie. "Digital gestures" (n. d.). Available from the *Doc(k)s* website: http://www.sitec.fr/users/akenatondocks/DOCKS-datas_f/theory_f/NOLAND_f/DigitalGestures.html.
- Queneau, Raymond. 'Littérature potentielle' [1964]. *Bâtons, chiffres et lettres*, Paris: Gallimard, 1950. Rev. 1965. Paris: Gallimard, coll. 'Idées', 1980. 317–345. 'Potential Literature'. *Letters, Numbers, Forms. Essays, 1928–70*. Translated by Jordan Stump. University of Illinois Press, 2007: 181–196.
- Sadin, Eric. *La Société de l'anticipation. Le web précognitif ou la rupture anthropologique*. Paris: éditions inculte, 2011.
- Saemmer, Alexandra. *Matières textuelles sur support numérique*. Presses universitaires de Saint-Étienne, 2007. A bibliography of Saemmer's works in English is available at: <http://elmcip.net/person/alexandra-saemmer>

- Seaman, Bill. "The Illusive Nature of Context: The Negotiation of the Thoughtbody". *p0es1s. Digitale Poesie*. Ed. F.W. Block, C. Heibach, K. Wenz. Ostfildern-Ruit: Hatje Cantz Vlg., 2004.
- Stelarc [Stelios Arcadiou]. "Le corps obsolète", interview with Jacques Donguy (1995). Trans. *Quasimodo* (Montpellier) 5, *Art à contre-corps* (Spring 1998) 111–119. Available at: <<http://www.revue-quasimodo.org/PDFs/5%20-%20Stelarc%20Corps%20Obsolete.pdf>>.

See also the following records:

- Le corps dans le cyberspace*. Ed. Simon Brousseau (June 2010): <http://nt2.uqam.ca/en/dossiers-thematiques/le-corps-dans-le-cyberspace>.
- Cyborg Bodies*. Ed. Yvonne Volkart *et al.*: http://www.medienkunstnetz.de/themes/cyborg_bodies/editorial/1/.