The Frontiers between Digital Literature and Net.art

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Abstract

My aim is to show how the frontiers between the various disciplinary spheres are disappearing in the digital world. Therefore, to start with, the basic aspects of what is known as digital art are set out and are compared with the concepts of Roland Barthes on the post-modern text. In this way a relationship is established between the discourses on Net.art and digital creation on the Net and theoretical postulates on hypertext and Net.literature. Next the results of this comparative reflection are applied to a visual experience: letting a series of online works speak, grouped together in a particular classification, in order to see whether or not the theoretical model constructed is valid. Finally, I pose questions about this experience by highlighting the implications of the construction of new contexts in real time in the sphere of literary and artistic creation.

I shall try to synthesize the central points of the discourse on digital art in order to demonstrate the gradual disappearance of the frontiers between the different forms of digital creation on the Net, starting with a statement that is widely accepted: the change from analogical to digital is affecting all areas of cultural creation (design, production, distribution, reception) and, in particular, the art world. Over recent years the specific function of art has changed. The traditional functions attributed to it – intuition, revelation, catharsis, expression, representation – are now performed far more efficiently by cinema, television and advertising. Art, therefore, has to reconsider its function, problems and system of representation. The social significance and the role of art have now to be sought in the process of communication, which consists of memorizing, processing and transmitting bits of information. Art has nothing to do now with the production of works – whether by traditional or electronic means – but with the discovery of the internal logic of a view of the world. Digital artists have replaced the paint pots, the brushes and the primers with the computer, Flash, Director or Java, and have become part of the community of software users. This use of digital techniques is justified because artists consider

that it is necessary to use the techniques that are contemporary with the thinking on which they wish to act. To talk of here and now one has to use the techniques of here and now; if the artist uses techniques from the past, they will have to say a great deal in order to be able to speak with the same depth and the same complexity. It is easier, therefore, to make use of what one has, the available techniques, as they carry much of the present: they are born of this present. In this way, the appropriate technique becomes more than just a simple tool, a simple fashion: it becomes a significant and integral part of the work.

But, simultaneously, this need to use the most recent techniques is paradoxical, as the technologies are dependent on inventions and the technological race, and at the same time a sort of stabilization of these techniques is expected in the form of standards. Computer science offers complex software. On one hand, what is called hypermedia consists of the ordering of a stock of information and, on the other, the synthesized image depends, from its beginnings, transformation and performance, on a series of laws coded by computer science. Should we be talking of software as a work of art? Digital is a medium with a potential that seems unlimited: the possibility offered to the artist of effortlessly combining images, texts and sounds in the heart of the computer's space-memory, without friction or gravity, gives them a freedom of creation hitherto inconceivable. The appearance of digital technology is at the heart of a fundamental change in terms of the creation and perception of images: it is now possible, based on binary numbers, to create an image that can be manipulated as never before. Thanks to this new technology, today's artists can invent not only new forms of "reproduction" but also of "production".

The digital confers a new power on the image: an infinite malleability. Until very recently, visual information remained static in the sense that, despite the possibilities offered by film editing, the image was fixed. Conversely, since the image has been translated into digital language, it can now be modified down to the tiniest elements; it has become information, and all information can be manipulated. For the first time in history, the image has become a dynamic system, given that it is capable of interacting or dialoguing with whoever creates it or looks at it.

Even though the public continues to be educated perceptively by images (photography, the cinema and television) and by the mass media (still subjected to an order against which generations of artists have rebelled against), the spread of digital technology, especially since the 1980s, has introduced increasingly important qualitative changes in the relationships of this public with visual, sound and textual information. This is because one of the revolutionary characteristics of digital is to associate the user with the working of the machine, establishing between them a short, rapid retroactive loop. The computer allows the user to interact with the visual, sound and textual data communicated to him or her. By becoming interactive, the nature of the media changes. An interactive image, though generated by an optical device (photography, cinema, television), does not have the same effect as a

traditional image with which no interaction is possible. The author and the audience share the same communicational logic, the same desire for crossover, for responsibility claimed in the making and the circulation of the information, the same sensitive space (that of the interfaces) and the same temporality. Artist and audience are forced to share the same time.

In the field of the image, digital introduces another change. It breaks the relationships that link the image, the object and the subject. The digital image is no longer an optical projection of the object coming between it and the subject, and keeping them apart from each other, reinforcing their status. The image conserves no physical or energy ties with the real, it is the expression of a specific language, the language of computer programs fed on algorithms and calculations; interactivity makes it dependent on the reactions of the spectator. The techniques of synthesis do not propose for the real a more or less similar representation but a simulation. Simulation and interactivity are linked. One simulates to interact. Digital introduces a new visual order, at the same time as it supplies artists with materials and tools that profoundly alter their relationship with reality. The materials and the tools of simulation are no longer those of the real world. Artists do not work with the material, nor with the energy, but with symbols and information. They process the information with these technologies because they are necessary for them to establish a true dialogue with the contemporary world, in such a way that they often cease to be tools to become the subject or even the object of the work.

Artists construct their language by dialoguing with the machine. This becomes their partner, their source of inspiration, their model and often even the subject of their artistic investigation. In the information era, artistic activity, like any other, has to adapt itself to mobility, exchange, the flow of information. Digital images have the advantage of being everywhere at once; therefore a kind of art is emerging that is specifically conceived to circulate around networks.

Digital art, like multimedia art, processes data that belongs to the sphere of sounds and texts and to fixed and moving images. However, what characterizes it is not the mixture of genres, but the establishment of its own language. The contribution of digital art does not consist merely in being able to digitalize music, even if that makes it possible to create sounds unheard of up to now, but in confronting the receiver with new, complex perceptive situations that hitherto could not have been conceived. A classic piece of music on CD-ROM support remains a classic piece. Digital art is not about supplementing classic practices, but about proposing totally new expressive and semiotic situations. The digital image is not just the fruit of a new way of producing images, but a radically new image, and it forces art to reconceptualize the very notion of image.

The majority of artists' creations are hybrids in which the technical possibilities are used to multiply the possibilities of expression. This hybridization is certainly one of

the most interesting aspects of digital art, as not only does it break down the traditional barriers between the arts, but it also introduces artistic approximation into areas that, up to now, have remained outside them. The main aim is not pluri- or multisensoriality but consensoriality. This is why it is so attractive for immersive practices or virtual worlds: it is a case of specifying new relationships in a representation that is no longer exterior, in the eyes of the perceiver, but which embraces them, treating them simultaneously as a perceiver and a contributor in the proposed sensorial world. It is thus the return to a certain realism: the perceiver experiences, in effect, the need for stable reference points, elements in which they can recognize themselves, and based on these reference points, they agree to let themselves be taken away to something else. The digital artist is the person capable of introducing semiosis to these technical effects and, therefore, of allowing his or her critical proposals to be shared intersubjectively, by making the work speak.

Placing an image on the Net only makes artistic sense if, and only if, the installation of this image corresponds to all the symbolic manifestations of the Net. In 1997, Fred Forest auctioned the Internet access code of a digital image; the buyer of this code possesses this work as a real work. The image ceases, in this way, to be an image, becoming an artistic objectivization of the concept of a Net. For the first time in history, a work, via networks, can appear simultaneously and in the same way, without losing anything, throughout the planet, as its materialization is merely a screen. This situation questions the very notions of culture, universality and totality.

It is an art without materials (although it needs to be memorized on material supports and has to be actualized on a screen). The dematerialization of digital art means essentially that any digital art creation is, to begin with, designed without a pragmatic relationship to the material. In this respect, it only definitely takes shape in a simulation: every manifestation of digital art is the simulated moment of an absent material. (The same thing occurs with a play. A published dramatic work is only a potential work, which only really gathers meaning in the various objectivizations of the performances that constantly renew it. This is also true for a musical score). The book and the score are, with regard to the theatre and music, the writing space, the simulation of the work that is realized in every performance or concert. In a certain way, it makes the old dream of total art come true: it unifies what up to now has been separate. Its objects “are not now images, texts, sounds, nor even the combination of virtual, acoustic and tactile sensations, but complex devices, hybrids, that include some of the instruments that have prepared them, when they themselves are not identified with the machines. There is no work outside the device – the device creates the work”[1] as Jean-Louis Boissier reminds us. It is an art of the model in the mathematical sense of the term; it is not an ideal but a formal model, calculable and operational. It is a work that each time “re-produces” itself identically, and which each time, at the moment of its realization, shows itself to be different.

A generative novel, for example, is a novel whose pages are not written anywhere before the precise instant of their materialization in a given place. It is impossible for two readers to read the same page of the same novel. A reader, unless he or she has the means to record it, can never read the same page twice. No two readers ever read the same novel. There is an author without whom the work would not have been possible and it is he or she who defines a meaning horizon for the work, but what changes is the author's relationship with the work. In classical genres, the author always had the last word. In digital work, it is the work that has the last word because the author finds himself or herself in the position of the reader who cannot now modify the result when it is realized.

Fascinated by real time, digital art is an art form that takes the risk of the happening, like *dripping* or certain types of lyrical abstraction. The work is produced live, and it is this production the spectator attends. But real time is the time of reception, not of production. It is the time of the show, not the physical processes. Digital work has the power to be everywhere at once: it is present simultaneously, unchanged, throughout the planet. In this it is like Deleuze's rhizome figure, as it can expand and reproduce itself by diffusion over all the nodes it gains access to. Thus the Net is the natural place for it to develop. Theoretically the Net itself could even become a unique work of art. Now, a single work could simultaneously occupy, and in several forms, all the screens on the planet. We therefore say that it has, by nature, the gift of ubiquity. In a certain way, it is trying to surround the spectator, immerse him or her in a creative universality in which the observer is part of the same simulation.

The digital work is, above all, a group of mathematical variables. For this reason, it is accessible to any other group of mathematical variables comparable to it. Thus, two works can interact, and their interaction creates a new work, in this way opening itself up to an immense universe of collaborations. Open to calculations, built on models, it is spontaneously available to be interchanged; therefore the presence of spectators influences the work. There even exists the possibility of constructing a theoretical spectator, a spectator who is part of the work: it would only be necessary to introduce a spectator profile into the model. However, interactivity is not participation, although in all interactivity there is a certain degree of participation. Participation is an attitude to the work, while interactivity is a presence in the work. The interactive spectator is not external to the work but an element of the model like any other; he or she is designed and constructed by it. All other interactivity is restricted interactivity, as it allows spectators to believe they have mastery of the work, while they only possess what the designer of the model wishes to delegate to them.

The settings of the simulators – such as piloting planes – as well as many videogames make an effort to give their users maximum mastery of the process. They work on reflex behaviour and primitive emotion, but do not try to cause semiosis or generate any new meaning, precisely because they have no artistic

aims; artistic devices on the other hand – perhaps because they are destined for public places – are made in such a way that they generally establish a distance, a series of ordered differences. Simulation devices are only efficient if they produce the most perfect possible clones of reality: to improve the efficiency of their pragmatic behaviour, perceivers have to rediscover themselves in the worlds in which they will find themselves confronted with. Interactivity defines a learning process in them. In interactive artistic digital systems, on the other hand, perceivers cannot know the rules to which their behaviour is subjected. These belong only to the device they are up against and they change from one device to another and may even change from one moment to another in the same device.[2] It is this difference that legitimizes the new artistic idea. Perceivers find themselves in a state of permanent surprise, and the choices they are invited to make are often blind choices. Interactivity defines an observatory there. Perceivers always have to try to understand, to anticipate and thus they are placed in the role of observer.

One of the most interesting aspects of digital art is therefore the relationship it maintains between the real and the virtual, between the world in which perceivers know themselves to be in and the world in which the artistic proposal places them in a simultaneous and indissoluble way. Although they are in it, perceivers know they are also outside it. They take part and observe themselves taking part.

It is in this duality where the basic interest lies. It is a situation that reminds me a great deal of the Bakhtinian metaphor of the carnival and its mechanisms of interpersonal communication. In the carnival there is open communication that breaks with the habitual hierarchical organization and social classes, as it is not based on any power structure; it is a priori an unstructured system, but which grows apparently chaotically with the incorporation of people who let themselves be carried away by it, and it develops according to the paradigm of the Net and a plurimedia format (dance, rhythm, body, image, disguise, music, text, context…) all interrelated in a creative, active, fragmentary, non-linear way.[3] Moreover, it is an ambivalent experience. Participation is individual, but not private, as it is open to everybody. To join in the carnival there are no rules or regulations of access: you just have to join in and adapt to the game. It is precisely this integration, participation, and interaction in a pattern that constitutes the basis of the carnival. The ambivalence also affects the double function that the participants take on: they are at once spectators and actors, they are both subject and object of the event, observers and consumers of the information flow, and part of the show. For Bakhtin the carnival is on the frontier between art and life. As Roy Ascott says, "instead of creating, expressing or transmitting contents, the artist is now in the business of creating contexts. Connection, interaction and emergence are as of now the watchwords of artistic culture. The observer of art is, as of now, at the centre of the creative project, and not on the periphery. Art is no longer a window open to the world but a gateway through which the observer is invited to enter a world of

interactions and transformations".[4] "Old art was made to be seen from the outside. New art is made to be constructed from the inside".[5]

Digital art transforms perception in action. In a society in which there is virtually nothing natural left (biotechnologies, genetic engineering, cloning, transgenics…), and in which the human being has become a cyborg, what Katherine Hayles calls post-humanity, digital art originates new symbolic representations and forces us to reconsider the frontiers between the natural and the technical, man and object, and perceive how they are becoming increasingly blurred. The perceivers of digital art are in a state of experimenting with their own aesthetic perception. The aesthetic object is modelled and understood when experienced.

And this experimentation can only arise in the context for which it was planned. What counts is the process, not the object that carries the materialization of this process. Of that there is never anything left. Therefore it can be claimed that digital art is worthless. Why keep one line and not another as the digital model always produces new updates? You cannot exhibit a digital work of art, you have to immerse yourself in it, browse, interact, and experience its processes in the planned surroundings. The work of art, therefore, has changed its status. After adopting the religious stance (the object as a sign of an invisible hereafter), the aristocratic stance (the object as a hierarchical sign of the person who possesses it), the bourgeois stance (in which being is confused with having), the work of art now tends to adopt the financial stance, that of flow: the work has no value in itself, but according to the movements it causes. This is logical in the new context of the information age.

The Post-modern Text

Yet this entire discourse on digital art is closely linked to the concept of the post-modern text.

The notion of the post-modern text[6] originates from the combination of structuralism, Marxism and psychoanalysis at the end of the 1960s, mainly in France. The text is no longer conceived as a product but as a production, in other words it is never finished, rather always potentially infinite and it escapes both its author and its reader. The text belongs to no-one, no-one masters it, so that the classic linear organization is broken in favour of a combinatory, fragmentary, arborescent organization, in other words, into demultiplied reading routes, where a reading of multiple meanings not necessarily foreseen by the author is authorized.

Different readings and different reading routes are always possible; none is, a priori, better than any other, because it is the reading that at every moment recreates the

text. In this way, the distinction between writing and reading is erased like that between the author and reader. Reading is no longer simple consumption, it also produces text, it is also writing. These multiple reading routes call out to other texts: it is the intertext that recalls a group of other texts in the text, which they forward on to other texts, to a potential infinite. As Roland Barthes says, every text is an intertext, it is a new fabric of previous quotes. No reading exhausts the text: there are always further readings and virtual routes possible.

The notion of the post-modern text is not restricted to just contemporary literature or writing: the text is everywhere, according to Barthes, as from the moment a reading route is no longer simple consumption, rather production, it is authorized to make it emerge. Text can also be found in visual works of art, including photographic and cinematographic works. To read, we no longer need the guarantee of the proprietary author, as the text is not an object for consumption, rather one of play, work, production and practice, and is tied to fruition and pleasure, as it is the space in which no language bars the way to any other, in which languages circulate.

Barthes' text[7] describes the non-restrictive, non-linear non-morphological way that texts work, which computer programs merely foster. What has predominated in the last two centuries has been the Newtonian reduction of the Text to the work. Now it is a case of displacing the notion of work with that of text. The work is an object that is seen, that occupies a space; the text, on the other hand, is a methodological field that is not shown but demonstrated, which rests on language and is only experienced in a task or a production, and therefore does not stay still but is constantly in movement. The text does not belong to any genre or any classification; it is always paradoxical. The work is enclosed in a meaning that becomes the subject of hermeneutics; the text is experienced in an indefinite search. The text is plural not in the sense that it has several meanings, but that it realizes the same plurality of meaning. The text is not a coexistence of meanings, but a crossing; it cannot, therefore, depend on an interpretation, but on dissemination. The work is the property of the author, but the author is not the owner of the text: the metaphor of the text is that of the Net; if the text spreads it is due to a combination that goes beyond the controls of the self who writes. The work is the subject of consumption, while the text is play, work, production, practice. In synthesis, a text is not made up of a line of words, from which a single meaning is deduced, but of a space of multiple dimensions in which different writings are compared, none of which is original. The text is a fabric of quotes that come from thousands of centres of culture. All in all one may deduce from this that in writing there is no subject with an identity: the beginning of writing is the "death" of the author, of this modern entity that emerges only when the individual and the person is recognized historically as having value; but in writing, as Bakhtin anticipated, it is language, not the author, that speaks. This weakening of the privileged position of the author translates into a

strengthening of the function of the reader. "(…) a text is made up of multiple writings, that come from different cultures and which, together, establish a dialogue, a parody, a response; but there exists a place where all this multiplicity comes together, and this place is not the author, as has been claimed up to now, but the reader. The reader is the place where all the quotes that constitute a text are inscribed, without any being lost; the unity of the text is not in its origin but in its destination (…)".[8] Although these theories of Barthes' differ from hermeneutics and the aesthetic of reception, given that they defend an ahistoricism in the production and the discursive reception, they are close to the critical theory that champions the precedence of the reader and which constitutes the most important precedent of the aesthetic of interactivity and the aesthetic of play.

This new structure imposes a new space and a new temporality, as the computer effectively sets the text in a new space and new temporality; the necessarily linear development of the text and the traditional book now instantly becomes a non-linear development: you merely have to click to be in cyberspace. With the Internet, the multiplication of reading routes has become immediately possible: by clicking on the anchors of the text, other texts can appear on the screen, which at the same time will forward us to other texts. In this way, just as the space of the text is the subject of a veritable explosion, of a mutation in hyperspace, inversely, the temporality of the text is reduced to the point of its disappearing in instantaneity: in the fragmented text, each of the fragments is immediately accessible thanks to links, and any one can potentially come after any other. With no pre-established order, temporality disappears, and causality too. It is no coincidence that the most popular hypertext software is called *Storyspace*, given that hypertext fiction is organized in space and not in time: the text becomes a labyrinth.

The characteristics of the digital medium contribute to questioning the work of writing and reading, as well as the roles of author and reader, which the theory of post-modern text deals with. The author in front of the computer effectively has to abdicate his absolute power over the text, because it escapes him or her. The authors of electronic literature soon chose to accentuate this aspect by playing with the interactive possibilities of the web, systematizing this interactivity by making a game/route of multiple choices out of reading the text; each reading therefore becomes, in turn, writing, because only one's route or another itinerary allows the text to be "written", updating it. Moreover, seeing as not all the routes can be followed at the same time, each time some "texts" remain "unwritten".

For Landow,[9] hypertext reconfigures – rewrites – the author in several ways. The figure of the writer in hypertext is close to that of the reader: the functions of writer and reader closely intertwine. Hypertext, which creates an active reader, contributes to the convergence between reading and writing; it encroaches upon the writer's prerogatives and grants some of them to the reader. A sign of this transfer of powers is clearly seen in the possibilities for users to choose their own way, to

annotate texts written by others and to create links between their own and other people's documents. Hypertext, by reducing the autonomy of the text, also reduces that of the author: it does away with certain aspects of the text's authority and autonomy, and in doing so also creates a new concept of the figure and function of the author.

As for the reader, hypertext is the culmination of the recognition of his or her activity that begins with the theory of reception. Their activity will not just be that of filling in the "empty spaces" that Ingarden discovered in linear texts and becoming the "ideal reader" who constructs texts. Now they can choose their own routes and establish relationships and links between texts or parts of texts, so that each reader is unique in a literal sense.

Reader of hyperfiction have to take responsibility for their own routes and be aware of the nature of the text resulting from their actions, seeing as there is no "correct route", nor are some links better than others. By not worrying about the traditionally conceived plot, the reader cannot be "missing anything important", the feeling that can only be experienced in texts with a linear plot.

And when does a work of hyperfiction have to stop being read? When one has finished reading it? If there is no beginning or end, it may be complicated to know when to stop. Landow's answer is that readers have long been familiar with multiple or open endings in literature, books that end physically but without drawing any conclusions. What does "end" mean? A point of no return? The element that gives meaning to all that has gone before? When the reader decides to stop navigating, is the direction of his or her route reconstructed? A structure seems "closed" when it is experienced as a whole: coherent, complete and stable. This experience of the final stability of a structure will be marked by the particular structure each reader may be constructing; he or she may even decide to stop, leaving it open. Are we not, precisely, in a period in which uncertainty and indeterminacy predominate?

Joyce warns us thus in *Afternoon*: "When the story ceases to progress, when it falls into a loop or when its route tires you, that is the end of your reading experience", "in all fiction finality is a suspicious quality". It is the reader who decides when the reading experience, not the story, has finished. The criteria for the decision are not the fulfilment of the action but the fact that the story is not getting anywhere or that it is boring.

The notion of identity and authorship, which has been central since the Renaissance, is questioned not only for having placed a certain decision-making power in the hands of the reader, but for the fact that the author often plays at taking on different identities. One of the characteristics of hypertext is that of allowing readers to save the course of their reading route, and in this way contribute to writing their text, to making their mark on hypertext.

Combining both discourses, it is easy to see that they have a series of points in common, such as the consideration of the work as a process and the text as a product, or the image and text as information and algorithm, or new perceptual situations and new processes of semiosis they generate, hybridisation and simulation, the artistic and literary objectivization of the concept of the Net, dematerialisation and simulation, ubiquity, a fragmentary nature and non-linearity, software as a work of art and as a text, the updating of the new textual and iconic spaces, reception time versus production time, and action as reading and perception.

Textual Experimentations

Having reached this point, it would be good to check whether this theoretical discourse is validated, in practice, by the visualization of some examples of these new spaces of artistic and literary production on the web, which make a privileged use of the text and the image, and which could not be possible on a printed support.

Since 1994, and especially since 1996, the number and the diversity of creations on the Internet have grown exponentially. Despite its short history there are hundreds, perhaps thousands, of creative works on the Net. Without wishing to classify them, I can distinguish several lines of research that I group into the following categories: hypertext, connectivity, code art, relational cooperation, text generators, and visual poems.[10]

Hypertext

The arborescence, multi-linearity and maze-like structure that characterise the structure of a good many electronic works transform the notion of text space on the Internet. Added to this spatial depth that the relationships between the pages construct, is the two-dimensional treatment of each page. The surface on which the text is placed has been the subject of numerous experiments by artists. The size of the computer screen, its luminous nature, the status bars and the scrolls that make it possible to hide the text or show it, the textured and/or coloured screen backgrounds, the size and colour of the letters, and the choice of the typography are ingredients that artists bear in mind when processing the text in their works. The use of these possibilities has considerable influence on the meaning of the words, statements and stories that make up the work.

Most hypermedia works are “closed” works, in other words, autonomous entities whose links and nodes are inside the work. The reason why they are on the Web and not on CD-ROM or diskette is related to the mode of diffusion chosen by the creator and the nature of the language (the software) and the writing. Hypertext literature that has existed for years, that works with the interaction of texts integrated with other media, has installed itself on the Internet both as a mode of diffusion and of creation.

One of the pioneers of this kind of literature and artistic creation on the Net is *LoveOne*[11] (1995) by Judy Malloy, a work of purely textual narrative fiction, in hypertext format, set out like the pages of a diary that seem to explain a love story, although it is difficult to guess what it is about; many interactors will not reach the end, as they will feel disoriented or lost. In fact, it is about the relationship between two lovers, their emotions, what they feel and how they feel it. It has 129 pages, with a white text set in a column on a black background, 4 green pages, 9 red and 12 blue. You can click on every red line to turn the page; the blue lines indicate that you have already “read” them. On page 129 you will find the word reset underlined in red; by clicking on it you accede to another text by Judy Malloy. Space, in *LoveOne*, has no importance due to the presence of technology: it all ends up as a single *macroplace*. It does not matter where you are. All the characters feel and relate to one another in the same way. The fact that the stories are interlinked creates the feeling of not knowing exactly when they take place. Time is disordered, there is no beginning or end – it is like a collage. It is, therefore, a story without the typical narrative characteristics (introduction, exposition, denouement). *LoveOne* is a metaphor about the Internet, where you can find everything, pages for everyone and on any subject. In *LoveOne* there are also emotions, sex, music, cars, friends, fun, modems, the beach, all mixed up, as if it were an Internet portal. The experience of clicking to go to another page is similar to that of making a search with Google: you can control where you want to go but the control is lost when the page you get to is perhaps not the one you were looking for.

Within this new form of literature we find the poetry of Jason Nelson and his interactive poem entitled *A tractif*[12] (2000). On the main page there is only the name of the first eight numbers; by clicking on each of them, a fragment of text appears. The option “move” allows you to move the text around the screen and the option “x” to close it. The different fragments can be opened by following the numbering, or doing so randomly; you can leave some fragments on screen and close others, so the poem takes on multiple possibilities. A soundtrack of murmurs and whispers seems to breathe at a half-choked pace, somewhere between anguished and possessive. The interactor can make over 40,000[13] different combinations from a single poem thanks to the freedom to manipulate the texts directly.

Olia Lialina: *My boyfriend came back from the war*
http://www.teleportacia.org/war/wara.htm

In *My boyfriend came back from the war*[14] (1996), based on the feelings and emotions produced by a personal situation, the Russian artist Olia Lialina establishes an interactive narrative scheme in the form of a conversation. In the evolution of the web, the best-known browsers (Netscape and Explorer) have made it possible to read frames, which has made the design of html files more dynamic. Dividing the surface into areas and allowing some areas to remain on the screen while others are replaced, the frames have contributed to dynamizing this space. This is one of the more notable projects in the use of the frames, as it shows the narrative potential of this technology. The image of a couple sitting constitutes the frame of reference throughout the work. It is a fixed image, and the relationship between the individuals shown will remain intact, even if a lot of activity occurs around them and ends up affecting our reading about this relationship. The rest of the screen is divided into areas, separating the conversations that take place into other squares, getting smaller and smaller. Each conversation is a route that the reader can take but which will always end the same way, in a completely black window, representing each time a possibility that gets darker, a voice that fades in lack of understanding, lack of communication or misunderstanding. Waiting and lost hope form the narrative thread of the work, characterized by the effects produced by the use of frames, in such a way that they accentuate its dramatic nature more efficiently. Lev Manovich has established a parallel between the use of frames in this work and the technique of film editing. The story hinges on a conversation between a girl and her boyfriend, who returns from the war. In the reference image, the two lovers turn their backs on each other and the internaut, according to the disordered clicks, will read their first chaotic exchange and will eventually lose the meaning of the dialogue. The questions will not necessarily require correct answers, seeing as their visualization will depend on the internaut's order of intervention. But all in all, whatever the route taken the story remains clear, not in a first semantic degree, but in the feeling produced by this conversation without rhyme or reason, which betrays lack of understanding, lack of communication or misunderstanding. The interface plays a much more important role than that of simple support, as it participates in the narrative and semantic construct.

Ghost City[15] (1997), by Jody Zellen, develops a hypermedia universe where the image predominates. The user can choose between twenty-five links presented in the form of a square subdivided into equal parts of five squares by five, each of which is an animated image or a coloured square that contains one of the letters of the title of the work. By clicking on one of these links, you enter the metaphorical representation of a ghost city where you find more links, that send you to other pages, other animations, other streets, districts, spaces… and you end up getting

lost in this unknown city. Texts that move around the bottom of the browser take part in the construction of the meaning and this strange atmosphere. Internauts find themselves becoming submerged in a graphic maze, in the cybernetic architecture of an infinite and chaotic space. It is memory and the journey through time and space, whose images become fragments of distant memories or a disturbing dream. Continuing with the reflection on the urban experience, Jody Zellen, in *Ghost City*,[16] suggests using the Internet as a magnifying glass through which you can look at the city. At first sight, the work seems simple, like when you see a city for the first time; when you go through the work, the impressions build up and become more and more complex. Jody Zellen creates a mosaic of images and texts that simulate a stroll around the city as if through a maze; the project has a cyclical structure based on the principle of repetition, with images that move and multiply. You will also find several dead ends, hidden links and unexpected places; also, you can return to the same spot and think about what you have missed. *Do you Want Love or Lust*[17] (1997), by Claude Closky, presents a hypertext arborescence with a choice of two answers to each of the questions put to the interactor. In a satire of magazine surveys, the internaut is invited to decide between two options. Through an endless series of personal questions, similar to those found in tests in popular magazines, this project sends you on an endless route, which recalls the obsessive activity that browsing on the Net can turn into. The act of choosing, often a synonym of interactivity, based on the pleasure of exerting a certain amount of control over the contents presented, is soon seen to be frustrating, because the list of questions proposed by the work gets longer and longer. The repetitive nature and the limited choice of answers mean that this adventure soon loses its interest. The internaut quickly discovers that this supposedly free activity is no more than following the same process, click after click, with no answers, no conclusion. The work alludes to the lack of critical sense and the complacency that easily sets in when you browse the web, and reflects on the way that certain websites are aimed at us personally and want to keep hold of us by making us slaves to the mouse. The first question to answer is *Do you Want Love or Lust?* A choice, therefore, that will lead you to different questions according to the clicks made. In this way, if there are two answers to each question, and if each answer determines the next question, you enter a complex process in which browsing is merely the result of the retroaction between the user and the machine. Closky uses, ironically, the magazine surveys that award points for personality or tastes, juggling with privacy and sarcasm and plunging us into frustration as we never obtain any results.

Connectivity

Open works can have two forms: they are either wholly made with links that are external to the work or they include, as well as their internal arborescence, links to other sites not produced by the artist but which participate in his or her discourse. In the majority of cases, you can begin an interminable cybernetic drift from these sites, as the links become innumerable, extending beyond the initial project and eventually escaping the creator. They are, therefore, works that use other pages, sites, images, texts, etc., existing on the Net and conceived and designed by others, towards which the internaut is forwarded via the links established by the author.

The Belgian designer Michaël Samyn, founder of Group Z, presents *Love*[18](1995), a project that explores the notions of what is public and private, offering different points of view on love (from the daisy whose petals are pulled off electronically to the quotes from the Marquis de Sade). Users can contribute their secrets to it and read those of others. This part of the work recalls a wall full of graffiti and refers to the popular and accumulative aspects of the Internet. As is usual in their projects, the artists of Group Z exploit the potential of the Internet to reveal everyone's most intimate secrets and desires to strangers; in this way, they highlight the possibility of transcending social conventions on the Internet.

With *Being Human*[19] (1998), Annie Abrahams gives moods and emotions to words, which are grafted to their meaning thanks to the use of the size and colour of the letters, by the choice of typography and the screen background. For the author, "the project consists in the exploration of the common denominators of the human being. Up to now, I have worked on the will, the need to be comforted, understood, the will to open yourself up to the other and the need to protect yourself. On the web we are all nomads face to face with our status as strangers. I try to make propositions that have the possibility of making this state liveable".[20]

Being Human[20] is interested in communication on the Internet, in particular in the nature of e-mail correspondence. Taking the text as a means of expression and exploiting the different ways of processing it visually, the artist wonders about the wish to come into contact with the other, about individual difference, about the possibility of establishing a true interchange on Internet. She uses different visual interventions in order to express the nature of these interchanges: the choice of the text and screen colour, the size of the lettering, the superimpositions and the fragmentation of words, their appearance and disappearance, all tend to underline different states that have to do with the quality and intensity of the interchanges. The work highlights the will to communicate, its possibilities and limits: what makes us human beings is that fundamental desire to relate to others. The main page proposes different links that take you to different sections: good morning, your wishes, identity, I want (a kiss, tenderness, respect, pain, a future...). Good morning functions autonomously and does not present any interactivity; it acts as a

welcome, an introduction to the work. Coloured windows bearing messages open and close, composing a unilateral conversation with the internaut: "Bon jour, comment allez-vous?", "Ça va", "Who are you?", "Vous ne me connaissez pas", "Who am I?", "The same as you", are questions and answers that make up this dialogue. Here, then, Annie Abrahams questions the identity of the Net, the "qui sommes-nous sur le Net?". A piece of advice closes this page: "wave to your neighbour", that shows us what the first step ought to be for one individual towards another. Other links execute small applications in which the internaut is deprived of interactivity and obliged to wait to the end of the messages in order to have further access to the website. "What are our limits and our possibilities in the desire to communicate on the Net?", asks the artist. How can the user receive this information knowing that it is not meant for them personally, even though the message asks them directly? How can one experience something intrinsically human through a computer screen, with a stranger to whom we are also and who writes to all kinds of internauts? Can you experience the other on the Net?

Juliet Ann Martin,[22] with *oooxxxooo*[23] (1995), combines the meaning and the material nature of words, giving them a space on the screen that pushes back its limits. These signs, words and sentences take routes that go beyond the immediate surface of the screen and which the use of scrolls allows us to discover. This work falls within the tradition of calligrams, poems that draw a figure in space relating it to an aspect of its content. Grouped together in them are a series of texts, related through links, that are chained together and reply. Not only do these calligrams form silhouettes, vaguely recalling real objects, but they also construct trajectories that push back the limits of space; in effect, they often exceed the edges of the screen, introducing elements of surprise and waiting. Every picture visually describes a state of the spirit, an emotion, a situation that corresponds to a text mentioning the gap between the organic world and the technological universe and mixing these two realities unexpectedly. Privacy cannot be achieved; the machine gets in the way and imposes itself, creating a tension that cannot be resolved. The work is defined in this way by its double meanings and its breaks of meaning, which contribute to creating a poetic atmosphere that the visual configurations and the spatial trajectories eventually support.

Some works take the rhizomatic aspect of the Internet much more into account, so much so that the entire work consists of a series of links. This is the case with the work of Natalie Bookchin, who radicalizes its practice up to the point that it only exists through its external links. *Searching for the Truth*[24] (2000) is presented as a quite minimalist page that consists of a white screen on which we find a series of nine numbers, where each one is an anchor to a different link; all of them go forward respectively, to the answer obtained by the search based on the word *Truth* made by different search engines. The result is a series of long lists of sites about the Truth. This search for the truth by Internet leads us to a conclusion: it is not on the

Internet where we shall find the Truth. It is an interesting work because on one hand it spreads through cyberspace, proposing many links that forward us to other links, forming in this way the branches of an arborescence that escapes the artist, and on the other, this limitless rhizome is a clear example of what Jean-Pierre Balpe calls[25] "the silence and the noise". Even today, the majority of those who connect with the aim of finding some information still fail; and this, according to this author, is because the internaut comes up against two obstacles. The silence, when the search engine does not offer them the right answer, or the noise, when it offers them thousands of web pages. Natalie Bookchin shows, through her offering, the great mass of information on the Internet and its absolutely vast nature. We are faced with the mastery of what is absolutely huge (cyberspace) and infinitely small (the internaut). The artist, therefore, centres on the theme of *infoxication*. Too much information kills the information.

Read me, the British artivist Heath Bunting commands us in the title of the work *readme.html*[26](1998), and we have to take this order literally, because with *read me*, Bunting makes use of the Web's powers of virtualization and transmutation to turn himself into a text, that is, a hypertext. We should not forget that the term "read me" is that of the instruction file accompanying a piece of software: here the hypertext gets mixed up with its own reading instructions, placing it on the stage, and its author. It is a masterpiece and at the same time a piece of great simplicity, which puts the bases of the Internet onto the screen; it is first and foremost a (hyper) space of language, read whilst browsing. In addition however, *read me* also shows up the place of the artist that has to dive into this sea to perform, to disappear in order to appear, underlining in a poetic, ironic, critical and playful way the tension and the interpretation of the private, personal and public that characterises this medium. In *read me* we read "Heath Bunting" described in a biographical text in the form of a telegram that describes his life and work. But this text is written, apparently, by an "other" (James Flint, The Telegraph, Wired 50). It is not, then, Bunting who speaks; moreover, each word of the text is underlined and this fact, as well as turning every word into an anchor for a link, depersonalises the artist, dissolving him not only in the words of another on the screen, but in the links that lead to other links all over the Web: by dissolving himself word by word in the hypertext, the artivist infiltrates the web that he ends up possessing and being entirely. Visibility, presence and action, on the web, thus depends on a work of appropriation and disappropriation, of staging and dissolution. The links to which it forwards us are not his work: he has only intervened in the work of investigation and selection. In this way, the notion of creation remains ambiguous, it refers us to Duchamp's ready-mades, as Bunting uses pages previously constructed, in which he does not formally intervene, in this way distancing the work from the creator. He only intervenes in them as a conceptualist and as a technician creating a series of links to other webs.

"The arts require witnesses".[27] The Internet is, in a certain way, a supplier of witnesses and a safe place for fans of voyeurism to observe from. It is almost certainly for this reason that the cameras connected to the Net twenty-four hours a day have proliferated, monitoring public places and private spots in real time, turning the public and the private into something that may be observed from the anonymity of one's own home. There are many artistic projects that use these kind of cameras and their fans as a source of creation. Among the projects that cast a critical gaze over the multiplication of webcams is *Multi-Cultural Recycler*[28] (1997) by Amy Alexander. It is a work that brings together several of the resources that are considered as belonging to digital art and Web art: interactivity, fleetingness, voyeurism and a certain degree of surprise. It also uses materials of which she is not the author. It gives the visitor the possibility of choosing three cameras, from a menu of about twenty, that are connected to the Net and set up in different parts of the world – at monuments, tourist sights or in private homes. Then the image one of these cameras is capturing at that moment is taken and mixed with the other two and as a result a collage is obtained that the visitor can sign and exhibit. In the recycling process the compound images already taken can also be used. Anybody can go to the original sites of these webcams. *Multi-cultural Recycler* knocks off-centre three phenomena of the web: the abundance of already existing images; the craze of the webcams that "look" at anything, no matter what and the fascination this generates; and the weakening of the notion of author and reappropriation/withdrawal that all information may experience in this medium. An interesting fact is that it is impossible for two people to arrive at the same result, even if they choose identical sources, as, by being transmitted in real time, the image from each camera varies constantly. In this project a fundamental problem is posed for web artists: the notion of the work of art. The artist puts at the disposal of the user an autonomous application suitable for digitally mixing and recycling the video-images that come from webcams that were already present on the Internet: she just chooses some without taking part. The active and artistic dimension of this work lies, on one hand, in this invitation to interaction between the application and the user, and on the other, in the fact that it uses images apparently of no interest to give them meaning in an original pictorial composition. With this action, the artist criticizes the proliferation of these webcams that, after all, are not much use, and she gives them a second function, recognizing their existence on the Internet and conferring upon them the status of a work of art.

Code Art

A constant in electronic art is artists exploring the medium and the language that constitutes a new technology when it appears. The consequence is generally the

production of a series of texts to analyze the "aesthetic" of the new works, while it is the tool, the equipment itself, that is the content of the works. They do not have, therefore, any other content than the medium and its technical possibilities. What all these works have in common the fact is the focus on a technology without trying to stake a claim to any artistic doctrine or style, or professing to containing any message or purpose. The internaut is at times invited and at times expelled from these micro-cyberspaces. It is, basically, a case of browsing and appreciating the compositions and recompositions of constructed, deconstructed and reconstructed universes.

This is without doubt the most subversive category of Cyberart, as it is the favourite domain of the hackers, the iconoclasts of the web and those who spread confusion in our browsers. Others, less extremist, use the technology as a pretext and artistic medium, changing the digital tools and media around to produce a work. Their aesthetic is based on the taste for the code font and low technology; it adopts an anti-image and pro-code attitude, prioritizing the use of the code machine, namely data without format: the ASCII is considered pure art. The interest in low tech is reflected in the supremacy of text over image, which is also low-quality such as bitmap. Its artists reject high technology such as multimedia, Java and Shockwave and express their interest for low bandwidth. Their artwork is an anti-usability race. They carry out different acts of sabotage around the browser: buttons and false menus, or traps designed to make interactivity and communication difficult, or cause it to get blocked. Their intention is none other than to reach the limits of the browser.

One of those most representative of these practices is certainly Vuk Cosic,[29] a Slovenian artist very active on the Net. He works with computer language and especially ASCII (American Standard Code of Information Interchange), the standardized code that allows text information to be exchanged between computers. The use of the ASCII lettering in these works is the result of a choice made by the artist in favour of low tech and refers to the origins of art conceived by computer and to the basis of communication via the Internet; it recalls certain ideals, like the wish for universality linked to the establishment of this code and the promises of accessibility of this technology. This looking back is also a critical response in the face of the frenzied race of new technology and the incessant consumption they demand of users. His site gathers together all his works and links to other works by different artists. One of his best-known ideas is *History of Art for Airports*[30] (1997), in which Cosic renders classic works of art in the form of minimalist pictograms; in this way he interprets the paintings in the caves of Lascaux, the Venus de Milo, a portrayal of Saint Sebastian and one of the Pietà, Cézanne's *Card Players*, Duchamp's *Nude Descending a Staircase*, Malevich's *White Square on White*, and Warhol's *Campbell's Soup*. Cinema is also present with the brothers Lumière, Star Trek and King Kong. Finally, it is the turn of Jodi, Bunting and

Shulgin: in this way, Cosic confers upon his contemporaries the status of great artists.

Some authors use technological language for its graphic and aesthetic qualities, like Ted Warnell, who composes works of poetry based on HTML and e-mails. With *Berlioz*[31] (2000), the artist invites the internaut to compose a graphic poem by browsing and clicking on the pre-existing lines of text in order to make other fragments appear. These texts come from messages sent to him by different artists. The poems created with this application (16,384 different ones can exist, according to Warnell) have an abstract meaning and their legibility, difficult for the interface itself, showing that it is not the meaning of the words and phrases that matters, rather the impression and the feelings that their graphic form arouses in us. Nevertheless, it is a feeling of frustration that predominates, as although its form is aesthetic, the work is made up of words, the word carries the meaning, and this escapes us completely. Does the poem represent a criticism of communication on the Internet? These phrases, which are overlapped, cut and created, written one on top of the other, these words erased by the pixels of the background image, do they not point directly to what becomes of a dialogical experience on the Web, namely chaos caused by an excess of communication? This techno-poem, composed of fragments of e-mails, codes and HTML language that accompany messages that are usually hidden, does not represent an ode to the glory of technology and the communication age. We were promised the communication age, the information super-highways… Is it really a medium adapted to communication and exchange between people?

The case of Jodi[32] is paradigmatic; they are a couple living in Barcelona, the Dutchwoman Joan Heemskerk and the Belgian Dirk Paesmans,. Their aesthetic and their formalist line have made them one of the inescapable references of Internet art. Their innovative, daring and carefree style has opened a line of work that has helped to define an important tendency in Net.art. The spirit of the work of Jodi can be summed up by the hacker slogan "we love your computer".[33] They play with the Internet, with the code, with the browser, and with us. And we play with them. They claim that when the Internet user visits their site they introduce themselves into his or her computer. Their work is impregnated with a decadent and obsolete aesthetic that recalls the typography and appearance of the monochrome screens of the first personal computers. When users go to their website for the first time, they find themselves looking at letters fluctuating on a black background that fill the computer screen, with no clues for browsing. You click at random. You find yourself faced with a series of pages that stage the code, the language, endless superimposed error messages, or the icons that populate our screens, etc. Gradually, you learn to choose, to browse without a compass in the space proposed you. Jodi force you to be not merely active but inventive, to explore, to put your imagination to the test, without stupidly following a mode of use. The surprise is

total, you never know what awaits you on the next screen, what will happen… The worry that the computer will crash is ever-present.

In the project *404*[84] (1997), their best-known work, the first page to appear is that of the famous error “404 URL not found”. Error 404 always originates when the user asks the server for a wrong address, which gets stored in the *error.log* file of the server program. Composed of only four pages, on its homepage it reads only 404, where each number links with one of its three other pages, “unread”, “reply” and “unsent”, all divided horizontally. A box of text appears in the bottom frame, reserved at the entry of the user’s message, accompanied by a reply button with the label “Re”. Once the message has been written and sent, the result will be the appearance in the top frame of this text with certain alterations that will deliberately sabotage the act of communication: in “unread”, the vowels of the discourse in question are omitted, leaving a meaningless text composed of consonants and punctuation marks; in “reply”, the message is hidden and is substituted by the user’s IP address; and in “unsent”, the vowels from the initial e-mail that were not sent are visualised. These three sections clearly show, respectively, three constants in Jodi’s work: the interruption of interaction, the loss of anonymity and the denial of communication. It is, therefore, a case of taking advantage of possible errors and unforeseen factors in hypertext language to construct projects of great graphic impact, in which the internaut is forced to fight against some pages that he or she never really understands. It is degree zero of the game.In the project 404 (1997), their best-known work, the first page to appear is that of the famous error “404 URL not found”. Error 404 always originates when the user asks the server for a wrong address, which gets stored in the error.log file of the server program. Composed of only four pages, on its homepage it reads only 404, where each number links with one of its three other pages, “unread”, “reply” and “unsent”, all divided horizontally. A box of text appears in the bottom frame, reserved at the entry of the user’s message, accompanied by a reply button with the label “Re”. Once the message has been written and sent, the result will be the appearance in the top frame of this text with certain alterations that will deliberately sabotage the act of communication: in “unread”, the vowels of the discourse in question are omitted, leaving a meaningless text composed of consonants and punctuation marks; in “reply”, the message is hidden and is substituted by the user’s IP address; and in “unsent”, the vowels from the initial e-mail that were not sent are visualised. These three sections clearly show, respectively, three constants in Jodi’s work: the interruption of interaction, the loss of anonymity and the denial of communication. It is, therefore, a case of taking advantage of possible errors and unforeseen factors in hypertext language to construct projects of great graphic impact, in which the internaut is forced to fight against some pages that he or she never really understands. It is degree zero of the game.

Riot[35] (1999), by Mark Napier, is an application that is presented in the form of a conventional browser with which you can connect to the Web in the classic way. On the other hand, the presentation of the pages is not conventional. *Riot* is a system that steals the code font of the pages it shows. The result is a notable confusion of information, of decomposed pages, of deformed and pixelated images taken out of their context, of repeated logos… At each page loading, not everything disappears in order to reconstruct a further act of sabotage. The result is screens constructed with elements that come from a great multiplicity of sites, each internaut constructing (or deconstructing) his or her page on the basis of what preceding internauts have done. Napier explains, in relation to *Riot*, that he has created animated digital compositions that evolve when the spectator comes into interaction with them. Collages made with fragmented interfaces, broken figures and bits of images found on the web: these motifs change over time, responding to the interaction of the spectator in a surprising and often unpredictable manner. At times they disappear suddenly or slowly dissolve, they unfold while the spectator is exploring the space of the work of art. *Riot* dematerializes the canvas by not imposing any limits on it. It is as if all the sites where we have browsed have regrouped in a single unique page, with the interferences that this entails. And right in the middle of the noise the work is born. Napier proposes a list of very eclectic links that can produce screens mixing the President of the United States, pornographic images, fragments of artists' sites, advertising strips and Barbie. Napier questions the large quantity of information on the Net; what could be an advantage is reduced to the image he proposes for us, warped, torn out, cut up, stuck, mixed, incomprehensible. All in all, is it not perhaps a representation of what the browsing of every internaut might be? An overabundance, a permanent zapping that in the end leads to no specific information but rather to graphic disorder.

Relational Cooperation

Interactivity and the possibilities for interchange offered by the Internet allow for the creation of collective works of art that redefine the frontiers of text. These collaboration projects lead to infinite growth and to continual transformation by delegating, at least in part, the production of the content to the visitor.

Some works on the Web are examples from this perspective, such as the project by Douglas Davis,[36] *The World's First Collaborative Sentence*[37] (1994). Created in the context of exhibitions and performances that involve numerous interactors, it has been under construction on the Net since 1995, with no known ending. Any internaut can add text, images or sounds to it to continue the last fragment and join in this huge project. The aesthetic responsibility is transferred to the readers. This is also

the case with *Please Change Beliefs*[38] (1995), by Jenny Holzer, a series of statements constantly revised by the participants. The variations contributed by internauts, the new ideas that are added to others, give it an infinite life.

The work by Maurice Benayoun,[39] *Et moi dans tout ça? 2*[40] (1997) , is also collaborative as internauts continually rework a given text. Here the quantity of text remains noticeably the same. The fragments of text are replaced by others inside the story by the reader, who thus becomes the author. The intervention of the participants distorts the original text, the Book of Genesis, a story known to all, which here becomes unknown.

In the project *The Temple of Confessions*[41] (1997), Guillermo Gómez-Peña, a Mexican artist established in the USA, uses the techno-confessions of thousands of internauts to expose the existing stereotypes and prejudices about ethnic minorities. The internauts' instructions are also used by the artist to create ethnocyborgs, which he brings to life in performances, like the one he did in the summer of 1996 at the Sonar festival in Barcelona.

Close to the work of Annie Abrahams is the project by Pascale Malaterre entitled *Ex-Voto*[42] (1996). The artist invites internauts to send their ex-voto (votive offering) that will be put online and will be linked to those of all the other internauts, in this way forming a huge virtual chain of solidarity. Each sentence is associated with an image, an old or new icon that the user selects from a series of amulets; they can send theirs directly, which will be added to the list. For the benefit of the user, Malaterre explains in the section "solidarity" that "by the gesture of expressing here a vote or a personal thank you, in the form of an illustrated message, an anonymous sketch posted on the Web like a bottle in the sea, I am helping to creating a poetic place, dedicated to the absolute, a small virtual stone deposited with others as a gesture to the memory of the solidarity that has appeared everywhere to fight against exclusion".[43] Here it is a case of immortalizing a testimony that will drown in the waves of the acknowledgements of others. *Ex-voto*[44] has a museum, a reference section, a kind of visual database, and all in all is based on the idea of the ex-voto, a popular tradition that consists in making a public act of thanksgiving (normally religious in nature). The testimonies left on the "chain" act as links between individuals and establish a relationship with the user recounted by these messages. The museum shows ex-votos from different periods and cultures, expressing the universal nature of the votive offering. Participation and collaborative work begin, in this way, to dissolve the idea of authorship.

It is the experimentation that counts, the relationship with the other through the work. The artist does not create, but puts forward a concept in which internauts are invited to participate, and the work is constructed around this active participation. But, is it the human experience or the result that counts? An answer can be found in the *Keo*[45] project by Jean-Marc Philippe, who was awarded third prize at the Ars

Electronica festival in 1999. The artist invites internauts to leave a message that, once sent, will be recorded and stored on a CD-ROM, which will travel on board Keo, a "passive satellite" that will begin a voyage around the earth in 2006 lasting 50,000 years. This formidable memory of humanity will land in 50,000 years' time and our distant descendants will then be able to discover what the people of the twnty-first century wanted to transmit to them. As is explained on the site, "all the people of the Earth are invited, up to the end of December 2004, to write and send a message in the language they wish of up to four pages, addressed to their distant descendants, in order to bear witness to their life, explain their dreams, their worries, their hopes, to express their questions or their beliefs, to transmit a word or a simple thought. Keo is a gift from the men and women of today for the men and women of tomorrow. All the messages received, totally uncensored, will lift off on board the satellite Keo to return intact to Earth a very long time from now, the approximate length of time that today separates us from the appearance of the first paintings on the walls of the Australian caves 50,000 years ago. As well as our messages, Keo will carry archaeological gifts full of symbols, which in turn will also inform our descendants of the state of our knowledge and cultural diversity in the twenty-first century".[46] The Keo organization has so far received texts from 120 different countries and is doing everything possible so that countries where the Web is so too well-established can also take part in the project. Beyond scientific and technological ambition, Keo gives us a formidable lesson in humanism and humility, inviting each of us to reflect on ourselves and through sharing messages, to rediscover our differences, our individual riches and our common belonging. It appears to be more of a scientific or technological project than an artistic one. Science produces the technology necessary to launch the satellite but art provides the cohesion, the fusion and the collaboration of people eager to transmit a testimony of their lives and those of their contemporaries. The entire artistic dimension of the project is expressed in this experience.

Text Generators

Some works let the machine carry out part of the work of text creation thanks to a system of databases constructed by the artist and a program that enables the selective extraction of this data. The computer thus becomes an accomplice to the process of creation. These projects are likewise based on chance and surprise, ingredients and effects that contribute to the poetic value of the sentences thanks to unforeseen combinations that elude the total control of the participant. *Cut-up* by William Burroughs will give you some idea of this experience. Some artists have shown themselves to be ironic in their projects in the face of this type of literary exploration.

This is the case of Mario Hergueta with *Stop Making Sense*[47] (1997). Aided by a program to generate sentences with, or without, adjectives, this work demonstrates the limits of the creative potential of the machine. Other works of a combinatory nature leave the internaut little choice and offer an even more critical view of this type of exploration, such as Roman by Antoine Moreau or *Face Value*[48] by Nino Rodríguez.[49]

Visual Poems

The negotiation between the text and its computer support implies another view of language, and leads us to see it in a new light, superimposed on the codes that allow it to exist, letter by letter, and word by word. Some works atomize language in order to explain this context that draws our attention to the language and which transforms our relationship with writing. The means offered by the Internet and computing lead us to reconsider it and reconquer it. Indeed, the transposition of language onto computer support requires it to be made to coexist with other programming languages, which involves an effort, a translation. Just like learning a new language, the experience demands unusual attention to the signs, to their sound and visual values, and to their arrangement, which eventually produces the meaning. The journey to on-screen legibility made by words set inside the html code, for example, takes an effort, and it is fascinating to see what can result from this adventure.

The Lair of the Marrow Monkey (1998), by Eric Loyer, is an interactive investigation of the seductive power of digital technology. The main focus is a character called Orion17, a minimalist composer fascinated by the models and logic underlying reality. “I would give it all up if I could be the marrow, the idea, the virus, the entity whose self is not physical”, he explains. When a vision shows him the way to realize his dreams of union with the world of abstraction, Orion makes the jump and joins a small team of researchers from the Institute for Investigation into the Mind of Marrow, where he experiences the euphoria and the frustration of life as “marrow monkey”. *Chroma*[50] is the second part of this series of interactive stories and has many ties with the previous work: the interest in the use of digital techniques and in exploring human fascination with the abstract, the exploration of the implications of forms and language in human experience and how the digital interface can make this exploration accessible, plus a multiracial awareness that sets out to define new discourses on culture through digital media[51].

The site *Holes-Linings-Threads*[52] (1999), by Alicia Felberbaum, is based on the visual and theoretical explorations that take the writings of the theoretical cyberfeminist Sadie Plant as their starting point.[53] It describes the connections

between the work of women in the textile industry and the birth of the computer. Ada Lovelace, the pioneer of computer programming in the 1840s, considered the first person to have conceived software, plays a large part in the theoretical and visual creation of this site. *Holes-Linings-Threads* uses a grid of selected images of Batley, West Yorkshire, in England, associated with archive material of the Industrial Revolution. Quotes from the book by Sadie Plant, *Zeros + Ones: Digital Women + the New Technoculture*, are mixed with images of the town and its industrial buildings, reproducing a meta-history of the participation of women in the textile industry.

Text Movement

With the help of the new tools offered by computing and the Internet, text takes new forms; it can now move in space, the text itself imposing a time on the reading. The use of animated Gifs in the works of Tim McLaughlin or in *No Memory*[54], by Valéry Grancher[55], gives words a mobility and life of their own. In Grancher's work, in which words are replaced very quickly, and in *Grammatron* (1997), by Mark Amerika, which uses Javascript, the relationship with time sometimes requires capturing the words and texts in flight, a phenomenon that profoundly upsets the notion of interactivity and the spectator's control. In *Je suis ton ami(e)… tu peux me dire tes secrets*[56] (1997), by Nicolas Frespech,[57] made with Java technology, and then on Shockwave Flash, there is the same barrage of statements that leave the passive reader in a position analogous to that of the cinema audience. Other web technologies have made it possible for new explorations to integrate the text in space and time. The use of Java Applets in *Fidget*[58] (1998), by Kenneth Goldsmith and Clem Paulsen, enables the text to be moved in space, creating multiple relationships between the words and the proposals. In *Truth is a Moving Target*[59] (1997), by Erwin Redl, the use of Shockwave allows for the appearance of text, and the multi-directional reading of the words, transforming the relationships between the words that may be established in order to construct the meaning. The work by Mario Hergueta, *IN the TEXT*[60] (1997), done in Quicktime VR, involves some words in a circular space that form a variable sequence according to the internaut's route. Finally, in the show section of *Avec tact* [61](1999), a work by Antoine Schmitt[62] made with Shockwave Director, a short text is transformed every time the internaut touches one of its parts. It is the dynamic, kinetic, sonorous poetry that, thanks to the computer, above all to its spread by Internet, has rediscovered an extraordinary creativity. To see this for yourself, you only have to enter the screens of magazines like *Tapin*[63], *Ubu*[64], *Akenaton* or *Doc(k)s*[65], *Karenin@*[66], and from these browse the large group of sites devoted to these poetic writings.

Interactivity and Hypertext: a Critical View

a) Interactivity

In the light of the works commented upon, the claim by Nathan Shedroff[67] seems to be correct: interactivity does not truly exist in this world of new technologies, although the habitual discourse never ceases to sing the praises of its interactive nature. This is exactly what Pierre B. Landry, of the National Gallery of Canada, and Richard Sainte-Marie, of *Arts Visuals Actuals*, think. He considers that Flash, Shockwave, JavaScript and Java are not interactive software, while neither can CD-ROMs, interactive television or reading a book be considered interactive. What do come close to a form of interactivity are non-linear stories, discussion forums, certain forms of environment personalization, videogames and MUD environments (Internet role games), while conversations, telling stories, software and games are frankly interactive.

So what could the constituent factors of interactivity be? For Shedroff they are retroaction, control, productivity, creativity and co-creativity, communication and adaptability. He reminds us that these elements are valid for digital media, but also for all kinds of experience. Television and radio have control, retroaction and a poor level of communication, with a lack of productivity and adaptability; an item of software (the text processor) has a certain degree of control and a certain degree of retroaction, high productivity, a lack of communication and a certain degree of adaptability; sport and games would obtain good marks in all the component areas. On the contrary, art exhibitions would get low marks, for there is no control, no retroaction, no productivity, no communication and no adaptability. There is nothing authentically interactive on the Internet, according to Shedroff, although you could find some exceptions. He recognizes, however, that things could change.

The term interaction, applied to the sphere of art, gives the spectator an increasingly important role. But what does that really mean? As Jérôme Glicenstein[68] points out, the growing number of works that appeal to the notion of interactivity invites one to rethink the place of the subject faced with devices that question the traditional mediations typical of the art world. Interactivity is presented, above all, as a territory of experience rather than interpretation: the reader's gesture is answered by a movement of the program, or inversely in terms of computer science. Interactivity appears, then, as a type of material to be modelled, to be worked in its transparency or its opacity, in its fluidity or rigidity. The power of the virtual lies in the perpetual demand for actualization, in the wish to gain access to it, to explore and discover: the inevitable let-down generated by the experience of the limits of interactivity reveals both its artistic dimension and its critical efficiency.

"Interactive" has become the business par excellence in the media, with budgets of thousands of millions of dollars, especially on television. The industries participating in the distribution of content via satellite, cable, telephone, and even electricity companies, are impatient to provide "completely interactive services", in the form of programmes à la carte, business from home and financial services; as for retailers, there is a huge market for interactive games, a growing multimedia hardware and software industry and a continual flow of successful CD-ROMs. The culture and entertainment sectors are investing in interactivity like someone casting the hook and line to catch new clients. Museums and art galleries are jumping on the interactive bandwagon. Virtual reality, the height of interactive application, after being a curiosity for selling cigarettes and motorcycles at trade fairs, is now entering amusement arcades and shopping malls, and has a perfect complement in shooting galleries and Jurassic horrors.

But what is all this about interactivity? Let's take any CD-ROM. We won't be able to consider it interactive if by this we understand that the medium responds in some way to the requests of the user, as well as visualizing the desired screen. Most CD-ROMs are less interactive than a dictionary. The fact that QuickTime video offers us a low-definition film as an illustration cannot be considered as a qualitative step forward for interactivity. Videogames are more seriously interactive. Nowadays, what are called "interactive systems" or "interactive installations" are a source of constant disappointments.

For businesses, interactivity is just another distribution mechanism, a way of making people buy things; an interactive device is a toy for playing with more toys. And behind all this we can discover an especially primitive model of human-machine relationships based on the humble remote control. From the advertising devoted to interactivity it seems that all culture is passing through something similar to the adolescent love of videogames. For the moment, interactivity continues to be essentially games and amusement.

b) Hypertext

And what have we done with hypertext works? Basically, we have played with them. The play aspect is that which has almost certainly predominated in our experience. Fictional hypertexts are not read seriously: we play at reading them. Little attention is paid to the wording of the text, to its meaning: people concentrate and amuse themselves by putting all their attention on the form, on the chaining together of the fragments, on the visual and sound possibilities, on the technical dimension of the medium. Not on the content (the majority of essays that speak of hypertext rarely focus upon the actual text: they discuss the virtues and possibilities of the medium, and the pioneering fiction of Joyce, Moulthrop or Gombrowicz is pointed out, but it is not read or studied).

The phenomenon is discussed without "opening the pages" of hypertext or browsing them. We could do a simple check: how many readers of this article have browsed deeply through the hypertexts online and offline? The medium is analysed from the outside for its social, cultural and political impact, for its technological implications, its computing limitations, to the detriment of other intrinsic aspects or properties. Hypertext fiction is no more than a game, which explains the lack of interest by the literary "establishment" for hypertexts and the lack of a clear identity of the product itself.

Some consider that hypertext is a sign of our culture. Clement argues that hypertext fiction "like the modern novel […] is also the bearer of a myth, that of a deconstructed, disseminated, fragmentary and discontinuous universe. Man searches within it for his identity and tries to weave links with his fellow men",[69] Michel Bernard believes that hypertext "adapts to our current way of thinking".[70] Stuart Moulthrop and Michael Joyce go further and argue that the de-hierarchization of work in hypertext will have revolutionary consequences, such as a fundamental restructuring of the production and reception of texts, a true lasting anarchy, a local autonomy based on consensus and a disintegration of global authority.[71] The aim is the end of meta-stories and of their authoritarian structures. Hypertext is presented as the narrative form that makes what Jean-François Lyotard announced a reality and which has been popularized, in the United States especially, as the post-modern condition.[72] In fact, it is the privileged theme of an American interpretative community, American post-modernism, because it appears as the most complete expression of its ideas of literature, culture and the role of the individual in society, and because it realizes almost spontaneously such central notions and attitudes like intertextuality, fragmentation, decentring…

But, regardless of its role in the arena of ideology, the disorganisation of the story due to the suspension or the adjournment of the end causes a contraction of the reading space itself, which is not so much liberated from its traditional halter as inserted into a new environment that favours the literal to the detriment of the other networks of significance. The lack of a general meaning, guaranteed by the end, is part of the cause. What is said and understood in the thread of the fragments is then imposed as the only meaning of the text. If I cannot go back over the story and its developments, in the light of what I know of the end, which serves me then as a privileged point of view, if I have no basis for re-evaluating the meaning, I take as true the knowledge that my reading, at the time of its progression, has established. My reading is no more than a logic of the process, that no result allows me to evaluate. It is a reading without an end, a reading that exhausts itself in a process that its does not have the means to interrupt or place in perspective. The end is Ariadne's thread that allows Theseus to get out of the labyrinth and say what has happened to him in there.

The traditional book is like a sandwich between the covers. It is a finite object, with a beginning, a middle and an end. Our reading habits mean that we identify the last page of the book with the end of the text, although we may not like it. We have ended up considering the physical limits of the book as if they were an intrinsic part of the story. This not the case with hypertext.

Reading a hypertext is a bit like visiting a museum. Different routes are possible and you do not have to look systematically at all the objects or paintings to get the feeling of having "done" the museum. We leave it not because we are certain of having exhausted all the aspects, but because we have satisfied – or exhausted – something of ourselves. It is interesting to note that parallel to this "not finishing" the reading there may be a corresponding "not finishing" of the writing. Between 1986 and 1992 there were five editions of *Afternoon* that often corresponded to five versions of the text.

In the early days of the publication of digital texts (1960-1990) a certain number of techniques, tools and ideas were developed and explored. These "tools for the mind" projected an optimistic view of the writing process: this could be significantly aided by the technologically imposed new forms of the structure. Hypertext, as defined by Ted Nelson, was one among many approaches. The only technology that has been successful is the text processor, which in some ways includes all the other technologies (tables, correctors, indexes…), even the hypertext format (with the option of inserting hyperlink). But, how many of us structure a document based on links? It was believed that these methods would have revolutionary effects on reading and writing, but we are still producing the same type of linear and sequential text we were a thousand years ago.

According to Espen Aarseth, the hypertext reading and writing of Ted Nelson seems to be a half-failed invention; an attempt at changing the world that in its more radical aspects has failed. Now, on the Net, perhaps the innovative genre that makes complete use of hypertext is the web log, also known as the "blog". Probably, the mode of reading and writing that hypertext was supposed to structure will survive, not as a dominant mode on the web, but as one among other forms.

By Way of Conclusion

What is the status of text on the Internet? What is the status of any text on a connected screen, in other words on the computer open to a net, and of its technologies? To what type of materiality are we invited? To what forms of reading and perception? Do we sail in cyberspace as on the high seas, with all the dangers this entails and the possibilities of being shipwrecked?

Text no longer exists in isolation; it is shot through with images and integrated into devices that animate it, erase it or turn it opaque. They are devices that modify its form as well as its texture. New words are needed to explain this new reality. Cybertexts? On-line digital art? Roger Chartier[73] suggests as much when he claims that the current revolution "is a revolution of the structures of the material support of writing and of the ways of reading". He claims that the electronic representation of texts entails new relationships with writing, where the materiality of the book is replaced by the immateriality of texts "with no place of their own", where the capturing of the totality of the work, made visible by the object that contains it, is followed by "the navigation/browsing of textual archipelagos with changing shores". Do browsers still read, muses Christian Vandendorpe, knowing full well that "as they browse, their reading will be discontinuous, quick, instrumental and totally oriented towards action".[74]

Is On-screen Creation like Sculpting Water?

We are going from papyrus to hypertext (according to Vandendorpe), from the codex to the screen (according to Chartier), from text to hypertext (according to Clément), from the page to the screen (according to Autié).[75] One can either play down or fear this transformation, or exaggerate its consequences and see in hypertext a new phase in the life of language (according to Lévy).[76] Whatever the evaluation made of this transition, the reconfiguration caused by passing to the connected screen forces us to re-examine the essential gestures of reading, in order to understand, at least, the constraints it is subjected to.

The supreme value in our cultural context is speed, and therefore progression through the text, but the importance given to progression is usually made to the detriment of understanding, as this requires time. Thus the danger threatening digitalized accessible text is its banalization. We could say, in reference to the past, that a text was not worth the paper it was printed on. The text on screen does not even have the luxury of an exchange value. Indeed, it has no value. The mediation by the computer and its devices has made it an immaterial presence. In the context of on-screen texts, this immateriality is characterised by a near absence of space-time determinations. Where is the text we are reading? What is the status of what appears on screen? The digitalization of the text brings with it a loss of symbolic value.

Are we, at the beginning of the twenty-first century, at the gates of a mutation similar to that which took place with the introduction of the codex? It is more than certain that analogical and digital forms of books will exist side by side, as will modes of inscription and communication of texts in handwritten, printed and technological

format. The problem is not, then, the disappearance or not of a certain support, but whether digital support will cause a new form of construction of knowledge discourses and specific modalities of reading; we are not talking of the simple substitution of one support by another for works conceived and written in the logic of the codex. The electronic text revolution, compared with previous ones, is so important because it is, simultaneously, a revolution in the technique of production and reproduction of texts, a revolution in the writing support and a revolution in the practice of reading. The electronic representation of writing radically modifies the notion of context, and therefore the very process of the construction of meaning, as it substitutes the physical contiguity that brings the different texts in a book or a diary together, with the mobile distribution of digital collections. Moreover, it redefines the materiality of works as it undoes the immediately visible link that unites the text and the object that contains it and which gives the reader, and not the writer or the publisher, control over the composition, the presentation or even the appearance of the units of text he or she wants to read. In this way, the whole system of perception and handling of texts is turned on its head.

The more mechanisms we have of recording and memory, the more the taste for the ephemeral, the direct and real time spreads. Up to now the work of art and its meaning has been based on the principle of stability, of uniqueness. Now, conversely, it is based on multiplicity, metamorphosis, the state of permanent construction. We can experiment in real time with images, in a permanent dialogue between computer and user. Now the user can enter data into the computer through the keyboard, the mouse, the optical pencil, the data glove, the virtual reality helmet, and all kinds of sensors. The ways out have also diversified, although the screen is still the most usual device. Therefore we can talk of a multimodal dialogue between human and machine. But the digital objects do not only react with the user, they also interact with one another. It is a case, therefore, of images that have neither a space of their own nor a distinct time. The image of synthesis has a corresponding time of synthesis, an open time, with no beginning or end, that generates itself and reboots according to the interactor and according to the parameters designed by the author. Photography and film capture the time developed by the object that passes in front of the lens; television captures the time in which the event takes place. On the other hand, the digital image neither relives a present already experienced nor brings to life a present being experienced now. It generates a present that has never existed and that will never be repeated: it forwards to a multiplicity of presents that may be actualized on screen. It is, as Couchot[77] says, a uchronic time that neither participates in a "this has been", nor in a "this is", but rather in a "this might be". What we see on screen belongs to a temporal succession at one end of which there is the image generated by calculation and, at the other, the action of the user: the interface between both is virtual time. The image does not "exist" until the spectator's time (the user's action) and the program's time (generation by calculation) coincide. Interaction takes place

in the intersection between the time of the image and the time of the spectator (who at the same time becomes the co-author), between the calculation time and existential time. The interactive image calculated in real time only exists as long as we actualize it. The function of "seeing" in analogical art becomes "acting" in digital art.

There is no dialogical mode between a painter and his brushes, a hunter and his gun, a violinist and his violin. This only exists when the program language comes between the machine and the user. It may certainly be thought that when a spectator stands in front of a painting (or a reader reads a book) an interaction is also produced, seeing as the gaze modifies the perceived image and everyone can construct his or her own interpretation. But this is a mental process that in no way modifies the real image (or the text) in the eyes of others. On the other hand, in digital interactivity, everyone can see the modification in the image of synthesis, and what's more, the computer only processes information expressed in its program language. Each movement of the mouse, each click, is coded in numbers (and thus the computer processes it) and decoded in pixels (and thus the user can perceive it). This is then, schematically, the process of human-machine dialogue. The more interaction there is, the quicker this retroaction is carried out, so that the user can control its action as he or she captures its effects on the screen. The language of logic (the machine's) and the language of the body (the user's) interweave through the porous wall of the interfaces.

These two characteristics – calculation and interactivity – configure the irrefutable technical novelty of the digital image and give it qualities that no image has ever had up to now. For the first time in the history of figurative techniques, the morphogenesis of texts and images (the creation of forms) and their distribution (diffusion, conservation, reproduction and socialization) depend on the same technology, which profoundly modifies the traditional status of text and image and has direct repercussions for the field of literature and art.

Notes

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2. As for example in *Video Place* by Myron Krueger, which constructs situation models offering the reader diverse possibilities of identification in which the attribution of roles between the system and the perceiver changes non-stop, with the latter finding himself or herself in a constant learning process.

3. Claudia Gianetti, "Ars Telematica: la estética de la intercomunicación", at http://www.mecad.org/e-journal/archivo/numero3/archivo/numero2/reindex.htm
4. Roy Ascott, cited by Norbert Hillaire in "Internet et la création artistique", *Art en réseau*, Éditions de la Table ronde Imagina, 1997, p. 10
5. Roy Ascott (1995), *Esthétique des arts médiatiques*, T. 2, P.U. de Québec, cited by Norbert Hillaire in "Internet et la création artistique", *Art en réseau*, Éditions de la Table ronde Imagina, 1997, p. 11
6. You can find more information in Anne-Marie Boisvert "Hypertexte. Dossier sur la littérature électronique", *Le magazine électronique du CIAC*, nº 9, December 1999, at http://www.ciac.ca/magazine/archives/no_9/dossier.html
7. Roland Barthes (2002), *Variaciones sobre la escritura*, Barcelona, Paidós Ibérica, Col. Paidós comunicación, p. 137
8. Roland Barthes, "La muerte del autor", p. 71
9. http://www.uottawa.ca/academic/arts/astrolabe/articles/art0012.htm
10. As regards this classification, you can see Jean-Pierre Balpe (2002), *Écriture sans manuscrit, brouillon absent*, at http://hypermedia.univ-paris8.fr/Jean-Pierre/articles/manuscrit.pdf, Cécile Petit, "Oeuvres d'art en ligne", *Archée Cybermensuel*, December 2002, at http://archee.qc.ca/ar.php?page=imp&no=191, Annick Bureaud, "Pour une typologie de la création sur Internet", *Observatoire Léonardo des Arts et des TechnoSciences*, January 1998, at http://www.olats.org/livresetudes/etudes/typInternet.shtml, and Richard Barbeau, "Pour une typologie de la création sur Internet (Annick Bureaud)", *Archée Cybermensuel*, April 1999, at http://archee.qc.ca/ar.php?page=imp&no=6
11. http://www.eastgate.com/malloy/ or else http://www.eastgate.com/malloy/kframe.html. You can read a commentary at http://enhanced-photos.com/hyperfiction/JMComments/comments.htm.
12. http://www.rhizome.org/artbase/2294/drag2.html. See also *Posterband Superstition* at http://www.posterband.com/super.html. Other poems by Nelson at http://www.posterband.com/turntable.html
13. P= n!/(n-x)! where n = 8. The total number of combinations is greater than 40,000
14. http://www.teleportacia.org/war/
15. http://www.ghostcity.com/ See also http://www.rhizome.org/object.rhiz?1936

16. http://www.ghostcity.com/
17. http://www.diacenter.org/closky/index.html.
18. http://adaweb.walkerart.org/%7EGroupZ/LOVE/
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28. http://recycler.plagiarist.org/
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30. http://www.ljudmila.org/~vuk/history/
31. http://www.warnell.com/syntac/berlioz.htm
32. http://www.jodi.org/
33. See Baumgaërtel, Tilman: "We love your computer. The Aesthetics of Crashing Browsers" at Telepolis www.heise.de/ or in Spanish www.inter-net.com.uy/vibri/atefactos/jodi/jodi.htm
34. http://404.jodi.org/
35. http://www.potatoland.org/riot/
36. http://www.douglasdavis.net/index2.html
37. http://ca80.lehman.cuny.edu/davis/Sentence/sentence1.html
38. http://adaweb.walkerart.org/project/holzer/cgi/pcb.cgi
39. http://www.benayoun.com/
40. http://www.benayoun.com/EtMoi/fr.html
41. http://www.echonyc.com/~confess/

42. http://www.cicv.fr/creation_artistique/online/ex-voto/
43. http://ex-voto.cicv.fr//
44. http://ex-voto.cicv.fr//chaine.html
45. http://www.cicv.fr/creation_artistique/online/ex-voto/index.html
46. http://www.keo.org/
47. Translated from http://www.keo.org/fr/download/keo_2p_esp_1612.zip
48. http://www.uni-mainz.de/~hergueta/nosense/sense.htm
49. http://www.mindspring.com/~ninor/
50. http://www.marrowmonkey.com/chroma/00.html
51. Carlo Zanni interviewing Erik Loyer, in Magazine électronique du CIAC, http://www.ciac.ca/magazine/entrevue2.htm
52. http://www.felber.dircon.co.uk/holesliningsthreads/
53. http://www.cognitiveliberty.org/pressroom/sadie_plant.htm and http://www.t0.or.at/sadie/sadie.htm
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57. http://www.frespech.com/index.php
58. http://www.stadiumweb.com/fidget/
59. http://www.c3.hu/collection/truth/
60. http://www.simulator.de/simulakrum/hergueta/intext/inhalt.html
61. http://www.gratin.org/as/avectact/index.html
62. http://www.gratin.org/as/
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64. http://www.ubu.com/
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72. Jean-François Lyotard (1979), *La Condition postmoderne: rapport sur le savoir*. París. Ed. de Minuit

73. Roger Chartier and Guglielmo Cavallo (2001), *Historia de la lectura*, Madrid, Taurus

74. See Vanderdorpe's declarations in an online interview on 21 May, 2001, at http://www.etudes-francaises.net/entretiens/vandendorpe.htm, as well as Christian Vandendorpe (1999), *Du papyrus à l'hypertexte. Essai sur les mutations du texte et de la lecture, Montréal*, Boréal / Paris, La Découverte

75. See Vanderdorpe's declarations in an online interview on 21 May, 2001, at http://www.etudes-francaises.net/entretiens/vandendorpe.htm, as well as Christian Vandendorpe (1999), *Du papyrus à l'hypertexte. Essai sur les mutations du texte et de la lecture, Montréal*, Boréal / Paris, La Découverte

76. Pierre Lévy (1998), *La cibercultura, el segon diluvi?.* Barcelona. Proa-UOC. Col. Biblioteca Oberta 8

77. Edmond Couchot (1998), *La technologie dans l'art. De la photographie à la réalité virtuelle*. Nîmes. Ed. Jacqueline Chambon, pp. 137 onwards