I am online

Presenting myself at work through a web site.

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Foreword

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The body of this thesis was typed using the word processor of the open-source suite OpenOffice.org 1.0.1, and set in BitStream's Aldine721 BT, a font based on Monotype's classic Plantin, and printed on 100% recycled paper using a Brother HL-1450 printer.

The rM web site can be accessed at **http://raphael.phase4.net/**

The site resides on the servers of the web hosting co-operative Ouvaton, which can be reached at http://www.ouvaton.coop/

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To Célie, Rose, Edmond and André.

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Introduction

Since the beginning of the general-public, commercial career of computer networks and especially the web, people have been creating content, and making it available for visitors, as the online combination of the old activities of creating and publishing. One particular shape of such content was the personal site, aimed at presenting its owner. The famed “homepage” is almost a genre, its different incarnation created with more or less talent by many different people, all over the web.

Following the same aim, but with different means, I have been involved in an effort targeted at helping people communicating themselves, in groups that have little or no occasion to meet in real life. One key notion that emerged was that of *intent*, which, we found, might be contradictory: it seemed that by intending to present oneself, one runs the risk of tainting the presentation and rendering it inaccurate and useless, thus defeating the original purpose. Subjectivity had to be avoided if the communication was to be accurate.

This line of thought led me to paying closer attention to the homepage I was making on my free time, dubbed ‘rM’. The motivation for creating it was to advertise my services and to present myself as a potential co-worker on web-related projects, “me, at work”. The need to ensure my motivation in the long run prompted to make its use directly rewarding. This choice that had another consequence: it appeared to remove the intent of presentation.

The first questions raised by the web site were thus whether, and how, subjectivity could be expunged from the presentation. However, as the work

progressed, the question of the value of the site rose in importance. Indeed, it appeared that subjectivity was, in modern theories of creation, a factor not to be ignored, and that on the other hand, those theories were pointing to a definition of creation, which is, in a way, the best way to communicate oneself.

And as André Bazin says about the early developments of photography: *"It was natural that the model that seemed to photographers as most deserving imitation was the artwork, which in their eyes already imitated nature, 'only better.' It was a while before, becoming artists themselves, photographers began to understand they could only copy nature."* [Bazin, 1971, p. 13]

The research then became geared towards finding which aspect of nature web creation can try attempt copy, notably by studying the rM site.

The first part of this document explains the reasoning behind the creation of the site, and specifically the quest for reality that shaped it. Reality as a proxy for the requested accuracy; subsequently, transparency as the natural way to convey reality to visitors; finally, the completeness implied by transparency.

However, the notion of 'accuracy' itself seemed suspect, and an analysis of its foundations shows in part two that it carries a large body of questionable ideology with it. Worse, the theory behind it has been battered by the evolution in psychology, and notably the introduction of the psychoanalysis, whose postulate of the unconscious makes room for modern theories of creation.

Indeed, as part three argues, the question that the rM site really asks is that of the shape of creation on the web. Bazin's theory of cinema created a better understanding of modern techniques of creation, and can be used to put the online medium under scrutiny: memory emerged as an aspect of nature that the web could attempt to copy.

This study opens on the analysis of the rM site's intention of reality.

I. Intending reality

> “I have to get some idea of who he really is,” Laney said.
> “Christ,” Blackwell said, “that’s a poser.”
>
> William Gibson, *Idoru*, 1996.

Early on in the course of the work on displaying identity in the context of groups of people meeting exclusively online, it became clear that there was an issue to be explored in the *intent* of the person presenting herself. Intention seemed to have the potential to *taint* the communication by introducing a bias, and mislead the recipient. The problem was not honesty, but rather the *subjectivity* of the person, which seemed, in the end, to diminish the very value of the presentation, its efficiency, and thus to be prejudicial to everyone involved.

a. Factoring subjectivity

A possible solution was identified in integrating the opinion of others in someone’s profile, so that on average, that person’s evaluation would be unbiased. The different biases could cancel each other out, and the synthesis of the opinions would be very close to the *reality* of the situation we were trying to describe.

However, this solution made me uneasy: although I was convinced of the validity of its principle, I found the implementation to lack elegance, and it seemed that it would be difficult to obtain a meaningful reading fast enough.

Indeed, it would only be after a number of interactions between the user and the system, and between the user and others that any significant average could be constructed. The original purpose would thus be defeated, because in that time, users could very well get an idea of each other through direct contact. While it did allow sharing the image with other users who had not been in contact with the person, it was not yet a very powerful method, and did not seem worth the effort of implementing or using it.

Making choices explicit

My focus evolved then towards obtaining the same kind of reliability and realism without requiring input from other users, as the rM project did not involve other users on whose opinion the site could rely. The objective was a reliable communication of my reality, made by myself. And the issue of subjectivity had to be tackled:

> Given nonfiction's historical linkages to the scientific project, to observational methods and the protocols of journalistic reportage, it is not at all surprising that, within the community of documentary practitioners and critics, "subjectivity" has frequently been constructed as a kind of contamination, to be expected but minimized. [Renov, 1995]

The project to present myself through a web site was indeed similar to the creation of a first-person, online documentary. And indeed, observational methods did apply: if I was to convey a valid idea of who I am to visitors, I had to be careful in neutralizing my influence on the discourse. Perfect objectivity can of course never be achieved, so the point was not to suppress subjectivity altogether, but to concentrate it in one place and expose it there, to factorize it. Some scientific method of observation had to be chosen so that the reality of a person (the owner of the web site) could be reliably communicated to visitors.

The method I chose to achieve that was to define, once for the entire life of the site, the body of information that I was going to enter, and to create procedures that would transform my input into what the visitors see. While not denying the subjectivity of such choices, making them once and for all seemed to ensure a certain degree of stability. Making the choices obvious and stable ensured the *transparency* of the system.

Such a manner of proceeding ensures that while my subjectivity is not negated, it is somehow frozen in one place, and exposed as such: some sort of full-disclosure mention, to make viewers aware of the site's nature. This mention is similar to those in place in most quality newspapers: *"free to write what he thinks*

and independent, a journalist at Le Monde [... must nonetheless apply the newspaper's] *collective rules."* [Plenel, 2002]

Here, by making the choices explicit as *Le Monde* did when publishing the style guide [Le Monde, 2002] Plenel was presenting, I pledge to the visitor that I will abide those choices. I am to use the site as a technical support for my research and production, and the site shall publish, automatically and without further intervention, the proceedings. The rules for sorting, organizing and formatting are predefined and are not meant to specifically adapt to the content.

b. Aiming for transparency

The assumption was that the reality of my person was bound to appear clearly to the visitors, if they were presented with all the activities I have during the course of a day. My activities were to be reported on, as accurately as possible: there was a double aim at transparency. On the one hand concerning the rules that govern the link between the information I enter in the site and what the visitors see, and on the other hand regarding the activities of my daily work life.

Glass wall and noria

Transparency was taken, at first, very literally: the site was intended as a window built on the side of my office, going through the side of my skull, so that people, visitors, could get an idea of what I do, how I work, etc. People must be able to see all the information that comes to my attention, the steps I take when processing it, and the end results.

The first definition of the rM web site got to be that I would track, with the help of the system, all the research I do, the sources of inspiration, information, my references; the activities I have in the field of creating or maintaining online products; and the products I eventually create.

To that end, edit forms allow the entry of information and its sorting. The system automatically dates the entry and makes it visible on its display side.

The logical "next step" might have been the creation of a tool that would publish my browser log, or the log of my use of applications on the computer. The technical difficulty of the task, the privacy issues it raises, and the necessity to deal with the huge amount of noise it would generate discouraged me from creating it.

The site is using the principle of the noria, the irrigation technique that uses the flow of a river to raise water from the riverbed to a network of irrigation canals. Less efficient than a dam, it only diverts a small portion of the waters of the river, but more subtle, it requires very little effort to be put into place and hardly modifies the flow of the river itself. In this metaphor, the rules governing the addition of information to the site's database are the noria; the site itself is the irrigation network; the river figures my activity. The idea is indeed to tap the power of my activity without hindering it. Badly designed tools can stifle creativity when they require many changes in the user's work flow.

Selecting the information

A more efficient set of tools (the browser log publisher, for example) would, without extra effort required from the user, yield more "catches", capture more information. On the other hand, more ambitious projects like an integrated work environment would require all work habits to be modified so all activity could be tracked by the system. The choice of the rM site was meant as the recognition that requiring a user to change habits is only acceptable when the benefit in new features outweighs the trouble. I assumed that is was not the case[1].

Regardless of its level of efficiency, this noria principle implies that there is a certain selection made in the items that I process to discard those that will not be stored. And this is where transparency has to be enforced. The second definition of the rM web site is the rule of selection of the information marked for storage: something is worth reporting when I think I might like to refer to at some point in the future.

This rule is not difficult to apply, it is merely putting into words an instinctive behavior, expressed by economists as a "utility," which is roughly a ratio between the effort of recording something in the site (the cost), and the expected benefit of being able to refer back to it at a later stage. [McCain, 1997] A regular home page (which only yields the indirect benefit of having visitors) is likely to have a very low utility. Making the site directly beneficial to its user means increasing its utility: the ratio is higher, and with the same effort of putting something online, the benefit is higher.

[1]The choice of a fairly low-efficiency set of tools over a higher-efficiency set was solely dictated by feasibility considerations. The very complex and important question of noise would need to be tackled seriously, should the amount of captured information increase with the raw efficiency of the tools.

The efficiency of the recording tools is the usability of the site: the easier it is to enter information, the larger the proportion of information that will be entered vs. the information that will be encountered, but unrecorded. The original preference ratio increases (thereby allowing more items to be entered with the same effort) with the improvement in usability. The utility of the tools would be higher, for example, if fewer clicks were required for the same action[2].

Publishing an existing article on the rM site requires 4 clicks of the mouse, the selection of the section of the site where it will be visible (with a single drop-down menu), and the entry of a title and an introduction. On the laptop I use for my daily work, the browser is configured in such a way that I can add a bookmark to the rM base in 2 clicks and the selection of the section, plus the time to type a description. Adding a note about an existing item requires 2 clicks and selecting the section and the time to type the note itself.

c. Exhaustivity and exactness

The information I record for future use is also available to any visitor happening on the site. But for this site to be fully beneficial to visitors interested in getting an idea of me (and not only in the topics covered by the site's content), transparency must be reinforced with exhaustivity. The site must communicate a complete reality, complex, and growing deeper as time passes. This means making sure that the site can handle large quantities of information, multiple relations between the elements, and some meaningful way to sort them.

Problems of organization

Instinctively, memory seems an area where the computer can best extend (that is, stimulate, support and increase) the functions of the working brains. Technology is described as an extension of its user by John von Neumann as quoted by his biographer [Heims, 1982] and extensively by Marshall McLuhan

[2]Optimal efficiency, which would require as little effort as possible to record as many elements as possible, cannot in fact be achieved by publishing my browser log. An item is not only its URL, but also its context and significance, which the system cannot guess. The rM web site as it stands may be as close as possible to optimal efficiency, because any such system is useful only when provided with a minimal amount of user input, thus always requiring some effort. Establishing this for sure would require rather advanced measurements and testing of different versions of the tool; such experiments have not been conducted: the judgment here is merely a guess.

[McLuhan, 1964, pp. 22-24]. Indeed, while my needs for computation are minimal (and satisfactorily served by existing tools), I often did find that my remembrance of precise items such as quotes, book references or web sites was faulty. This is of course due to the nature of the human memory [Lieury, 2000].

Web sites, for example, are an especially irritating specie to research. They require keeping track of an URL, but also what was interesting about the site. And the easiest way to keep track of URLs, bookmarks, does not help with context. Which web user hasn't been confronted with the curse of sub-folders of the favorites menu labeled "interesting" and stuffed with links to sites long forgotten?

The various services that offer to make bookmarks available online (MyYahoo!, BackFlip, Murl, etc.) sport such poor usability that their use in daily work is all but impossible. This is notably caused by their (partial) reliance on the inherently slow technology of web pages. The only added value such services offer is the accessibility to the user's bookmarks from any browser, and, in some cases, the possibility to share the bookmarks with other users.

Regarding bookmarks, rM is behaving precisely in the same manner as those services, but is trying to cover the annoyance of a web-based technology with some added value. The improvement it offers is to store context and significance. The former is obtained in part from user input (selecting a section from a list—this is copied from other services) and in part directly from the system (which keeps track of the entry date and time). The latter has to be typed in.

Compared to existing services and to the bookmarking function embedded in browsers, storing URLs on the rM system requires a bit of extra effort and patience, but offers significant added value, which outweighs the difficulties and motivates the user to store more information. This motivation pushes the site closer to its objective of exhaustivity.

Exact sorting strategies

Another requirement of reality is to apply my own preexisting, "natural" sorting methods to the site. Indeed, if it displayed information in a different way than the information is stored in my mind, it would mean that there is some interpretation being done between the recording and the display, thus defeating the primary objective of conveying reality. Studying the functioning of the human brain can help establish what those natural categories are.

The human brain is considered [Gutierrez, Ormsby, 2000] to store long-term memory in two stacks: the declarative (facts) and the procedural (rules of actions and procedures, skills). Within the declarative stack (which can be efficiently supplemented by computer aid), a subdivision is made [Tulving, 1988] between episodic (time-based) and semantic (sense-related). This human memory is highly efficient, and is capable of holding enormous amounts of information. This storage is however not reliable, and particularly ill-suited for keeping arbitrary chunks of meaningless data. Retrieval is also rather undependable, and in any case not fully subject to conscious decisions.

Computers have been created specifically with the ability to store information, but in a way that can be queried reliably. The rM site uses that capability to expand its user's memory, supplementing it where it is weak, but in ways that are similar to its natural mode of operation.

The information is thus organized using three criteria: function, date and theme. Those three "natural", preexisting ways of sorting information are confirmed by Tulving's classification of human long-term memory. First, *functional* zones, are linked to the different tasks I undertake while working. This corresponds to both the semantic ("what it was about") and the episodic ("when was it taking place") memory structures, combined: this is the organization that makes the most "sense", intuitively, because it is the richest. Practically, it appears on the site as the division in three "moments" of my work (library, activities, showcase) and their subdivision (in the library: bookcase, reference, inspiration). Second, organization by date, corresponding to episodic memory alone. Last, but not least, the thematic approach, which allows me to arbitrarily select themes that a given element would be related to; it corresponds to semantic memory[3]. This feature allows the creation of collections of items such as research folders, containing elements that may have appeared elsewhere, earlier, etc.

Because this triple sorting method is natural to my mind: it applies to all elements held in the rM site. I can store notes and articles, content copied from other media, URLs, book reviews or biographies, all using the same sorting criteria. The three distinct sorting perspectives are also of importance to the efficiency of the system.

[3]The thematic sorting method has been designed, but is not fully implemented yet on the rM web site. The need will probably increase with time, as the amount of information published on the site increases too.

Seemingly, the rM web site implements strategies and tools that ensure the best level of factorization of subjectivity, hence the highest accuracy and significance of what is recorded and displayed. Is the site fulfilling the objective of truly communicating my reality?

II. The value of subjectivity

The thorough design of the rM site, aimed at communicating my reality, likens it to other efforts of the sort, many of which were started in the second half of the 20th century under the banner of cybernetics. However, their theoretical basis, and especially, the applicability of cybernetics in social settings, have been criticized.

a. Characterizing entropy

One of the most debatable issues of the field of cybernetics is that of entropy. A concept borrowed from the field of thermodynamics, it originally describes the state of equilibrium of a system, reached when "letting it settle," it is the state of greatest disorganization. Often called (and abusively so) the "third law" of thermodynamics, the tendency of a closed system to *"spend most of its time in a state near that of greatest entropy"* [Wiener, 1948, p. 56] is applicable to physics, chemistry, biology, and even, some have argued, to social systems.

In order to jump from the field of natural sciences to that of social matters, Wiener calls upon Leibnitz, who described living organisms as a federation of smaller units (blood cells, neurons, etc.) [ibid., p. 155]. An attractive unified theory is put together from localized observations, and following Leibnitz, is declared applicable to all levels of reality, from the extremely small to the infinitely large, from inert matter to living organisms and social bodies. Proceeding from there, what can be observed in thermodynamics (and more specifically in the study of closed systems of perfect gases) is applied to human

societies. The first step of this process is finding how entropy acts and appears in our environment.

Social entropy and transparency

The period in which Wiener started putting his theory together is of great significance. The first important communication took place at a Macy conference in 1942, one of the darkest years of the century. The scientific community in the United States is being drawn into the war, [Schroeder-Gudehus, 1978, pp. 9-10] and Wiener, like many other scientists, is trying to make sense of that involvement, and of the terrible state the world is in.

In their paper founding cybernetics (the transcript of the conference), Wiener, Rosenblueth and Bigelow build upon that idea of interior-less humanity and insist that all human behavior can be described in terms of flows of information. [Wiener & al., 1943] Alan Turing and many other scientists also identified communication as a crucial characteristic of intelligent life. In their definition of the human being, they claimed that the human being is a construct *without an interior*. As social sciences researcher Philippe Breton mentions [Breton, 1997, p. 26], Turing considers *"the 'skin of an onion' analogy also helpful"* in explaining his concept of the human mind: he argues that the mind is made of successive layers of exterior, presenting *"certain operations which we can explain in purely mechanical terms."* He explicitly doubts the existence of a "core" which would resist mechanical explanation. [Turing, 1950, chapter 7]

For Wiener and many in his lead, such a vision of man allows the position of a strict equivalence between the human notion of peace and, in cybernetics, that of homeostasis. Homeostasis describes the state of an organized system; it can be reached by increasing the communication between its elements. Likewise, war and other social conflicts are described as chaos or entropy, which occurs when the communications are not intense enough.

Wiener's antagonism between entropy and communication is confirmed in his explanation of the Maxwell Demon problem [Wiener, 1948, p. 57], a physics riddle, which makes use of Wiener's description of *"information* [as] *essentially a negative entropy."* [ibid., p. 64] He explores the specific applicability of this part of the theory in the 8th chapter of *Cybernetics*. Roughly, Wiener claims that if humans are to live together in peace, communication must be increased, in order to fight the social decay generated by society's natural tendency to grow entropic. Wiener notes: *"That system* [the news media] *which more than all others*

should contribute to social homeostasis is thrown directly into the hands of those most concerned in the game of power and money, which we have already seen to be one of the chief anti-homeostatic elements in the community" [ibid., p. 161-162]

Such a criticism finds its echo in "homeopapes" that appear in science fiction[4]. They are machines that collect information and distribute it in the form of automatically printed newspapers, that fulfill the task of creating a constant flow of information through society.

"*The disappearance (...) of any reference to the interiority implies a fantastic boost to a notion that Wiener does not use in 1942 yet, but which underlies his discourse, that of 'transparency'."* [Breton, 1997, p. 27] And if the explicit mention of a machine-enforced transparency comes from popular fiction and not Wiener himself, his close involvement with early computer scientists like Turing, von Neumann or Vannevar Bush hint at the idea already.

b. The illusion of communication

Philippe Breton quotes scores of newspaper articles, from the 1940's onwards, that tout machine-enhanced communications. Social sciences researcher Dominique Wolton argues in this regard that

> the hypothesis basing this idea of a better communication through machines implies by itself another false hypothesis, the absence of a gap between the sender, the message and the recipient. History of communication, whether human or mediated, obviously proves the opposite. Man has always dreamed of reducing this gap, and the utopia of each new technology is to make people believe it is actually possible. If such gaps, rather incompressible, have the disadvantage of reducing the efficiency of communication, they have, on the other hand, the advantage of explaining why communication is rarely totalitarian. Precisely because there is no correspondence between those three spaces. New media will not cancel this gap, almost ontological, which is the source of human and social freedom in all situations of communications. Tyranny would begin the day that men would really believe that the rationality of technical systems annihilates the "noise" that is inherent to any situation of communication. [Wolton, 1999, p. 111]

Breton suggests as turning point of the vision of man Gaston Bachelard's book, *La terre et les rêveries de la volonté* [Bachelard, 1948]. After that point, the generally accepted vision of man depicts it as more "outside-driven," chiding

[4]Philip K. Dick's 1963 short story *If There Were No Benny Cemoli* has a homeopape version of the *New York Times*, which must be put back in operation to bring back social order on Earth after an interplanetary war has left few human structures standing. The term is also mentioned in several of his more famous novels, such as *Ubik* (1969).

away from an interior that has proved disastrous in the first half of the 20th century [Breton, 1997, p. 56]. Breton claims that the ideology of communication as the panacea of the outside-driven man has never been displaced since it was conceived by Wiener and others in the 1940s, and that it is very forceful in this beginning of 21st century, through popular authors such as MIT's Nicholas Negroponte and other such futurologists, abundantly quoted by both the media and politicians.

So is it possible at all for the rM web site to achieve some kind of use, to communicate some reality, if communication and transparency are an illusion? Following Breton's analysis, this attempt is defeated. Regarding modern media, its use of reality-shows and its questionable coverage of world events, Breton deplores: *"we are shown everything, and yet the essential seems to escape us."* [ibid., p. 133] And isn't the rM web site doing just this?

Distance and perfection

Breton mentions elsewhere in his book that the illusion of a perfect communication is in line with a lot of other such utopias. He sees Wiener's attempt as a scientist's claim that a human phenomenon can be totally explained. And he argues that all global theories, aiming at keeping something perfect, untouched, or optimizing it, seem like ideas intended as good but that eventually turn against those who wield them. Such ideas often use a scientific basis to lay their claims, and Breton mentions

> Although nothing, in the archives, points to this, there is no doubt that Wiener borrows this vision of man to the behaviorist theory. As a scientist, he was certainly convinced by the argument that science should only be concerned with what can be observed. In this regard, the "behavior of information exchange" is a perfect topic, because it can be observed in its entirety (which does not mean that it can be grasped right away, but that is can be potentially analyzed, by one with the adequate method).
>
> (...) What is new is not so much the staging of information and the movement of its exchange as a new topic of scientific interest—which is the common belief—but that this movement of information exchange be presented as integrally constitutive of the phenomena, both natural and artificial. Here is the origin of the "communication craze" that the later utopian discourse on communication is based on, even before Wiener thought of replacing, after a few years, the unwieldy "behavior of information exchange" with the more practical term of "communication."
>
> His attack against the classical "functional method" aims, as is underlined by his use of metaphors, at countering all the theories that claim any such thing as "interiority" in the phenomena. [ibid., p. 26-27]

The effect of such theoretical push in favor of the concept of communication can be sensed in popular literature. Social control, as described by Philip K.

Dick in his chilling short story *Service Call* [Dick, 1954], is the way to keep a society livable, regardless of the ideologies that contaminate it: the solution is to *make* everybody agree, to enforce homeostasis through mind control and the planned, systematic murder of any who still disagree. The inventor of the system is *"an Army engineer"*, a technologist involved in social issues who succeeds in divorcing the effective homeostatic control (enforced by machines) and its day-to-day operation (which is taken care of by repairmen, mere technicians).

It is a technological answer to a human problem; Dick's criticism is aimed directly at people like Wiener who analyze human problems in purely scientific terms, regardless of the human sense they make. Homeostasis is shown as a utterly dystopian possibility for the future, something very grim and that should be avoided.

c. Behaviorism and humanity

This dark view is based on the fundamental lack of humanity in the "purely scientific" theory of cybernetics. This characteristic likens it to the behaviorist hypothesis in the field of psychology. In 1913, the psychologist John Watson launched behaviorism with the following sentence: *"Why shouldn't we make of what we can* observe *the real field of psychology? Let us limit ourselves to things that can be observed and formulate laws concerning those things only."* [Watson, 1913, emphasis his] As a psychological theory, behaviorism states that nothing more than a person's observable behavior is needed to know her. It opposes previous theories that analyzed intent and conscience, as well as its contemporary Freudian theory of the unconscious.

Behavior and reality

Behaviorism was the leading psychological theory of the first half of the 20th century. It was in tune with that era's care for scientific precision: no *interpretation* was admitted as evidence. Hard, observable facts were preferred. Overall, the ideal was to have a permanent observation window over people, in order for scientists to identify patterns of stimulation and reaction, input and output. The behaviorist investigation method means recording all that can be observed and drawing conclusions from that.

The main problem of behaviorism is that it has proved incapable of explaining human behavior: eventually, the predictions did not check with clinical

observations. Inconsistencies appeared in the subjects' behaviors that could not be explained without resorting to some concept of interiority, of subjectivity.

The theory had become more complex over time, and by the end of the 1940's, intermediary, invisible events had been admitted in the originally simple stimulation/reaction couples, which accounted for more intricate behavior patterns. This provided for indirect means of modification of behavior that could not be directly observed, and was the first conceptual breach in the unity of the theory. The last shots of behaviorism were fired by Clark L. Hull, who proposed a fully codified theory of behavior, and Burrhus F. Skinner, who pushed the theory from learning to the language. But two years after the publication of Skinner's work, in 1957, Noam Chomsky made a case against it, and did away with experimental behaviorism.

The behaviorists can, in a way, get credit for the discrepancy between theory and observation: *"The disagreement comes from the fact that the conceptions were precise enough to be disproved, which is rather uncommon for that sort of theories."* [Le Ny, 2000] But the only important legacy of decades of research is the procedure: the way to observe and record human actions on a predefined basis is still considered valid in the field of psychology today. The basis for interpretation, though, has evolved out of the mechanical system Watson and his followers had built. Born at about the same moment as behaviorism, Freudian theories of the unconscious eventually rose to a wider acceptance while behaviorism dwindled away.

Psychoanalysis: rediscovering interiority

Sigmund Freud's writings have, over the years, convinced most psychologists. His theory of the unconscious, developed at the beginning of the 20th century, took a long time and a lot of effort on his and his followers' part to be recognized in the main body of psychology. Some of his ideas are still considered unscientific by a number of clinical psychiatrists and arguments still take place between proponents of different types of psychoanalysis, but generally, they have achieved a rather high level of acceptance in one form or another.

The main argument of Freudian theory is exposed in the first chapter of *An Outline of Psycho-Analysis*:

> Psycho-analysis makes the basic assumption, the discussion of which is reserved to philosophical thought but the justification for which lies in its results. We know two kinds of things about what we call our psyche (or

> mental life): firstly, its bodily organ and scene of action, the brain (or nervous system) and, on the other hand, our acts of consciousness, which are immediate data and cannot be further explained by any sort of description. Everything that lies between is unknown to us, and the data do not include any direct relation between these two terminal points of our knowledge. If it existed, if would at the most afford an exact localization of the processes of consciousness and would give us no help towards understanding them. [Freud, 1949, p. 13]

This very dense introduction can be summarized for our purpose as the proposition that *"the human mind possesses a large part that is not accessible to consciousness."* [Robert, 2000] This unconscious part can not be accessed nor expressed directly, but that there are ways to know it. Dreams, jokes, so-called "Freudian slips," pathological conditions and other manifestations based in the unconscious but that can be detected by consciousness are the material on which a Freudian psychoanalysis can be conducted.

Historically, one could consider behaviorism as the latest avatar of Cartesian thought, which views man as a purely reasonable creature. Freud, as one of the masters of suspicion (with Marx and Nietzsche, as Paul Ricœur called them), finally dispels this view with his idea of a mind that can not be entirely *known*, explained, communicated. Freud advocated returning to a vision of man with an interior, with an unknowable unconscious.

Subjectivity and creation

Freud's theory finds an interesting echo in modern visions of creation. Both Proust and Rilke recognize the rift between ego and unconscious, and suggest this tension may be the creative seed in everyone.

Quite extensive research has been done on the topic of the self in creation, quite closely mirroring the evolutions of psychology. A prominent figure in that research, Marcel Proust worked between 1905 and 1909 on an essay about Sainte-Beuve (1804-1869), a very influential literary critic, member of the Académie Française, who claimed that judging literary work required to know as much as possible about the artist. This led Sainte-Beuve to make tragic errors of judgment. He disregarded the greatest French authors of his time, and ridiculed Baudelaire, Flaubert or Stendhal in their art, while generally acknowledging them as "nice fellows" in real life. At the same time, he described mediocre bourgeois authors as unquestionable artists.

Proust, probably irked by the publicity around the centenary of Sainte-Beuve's birth, started working on his *Contre Sainte-Beuve*, (literally, "Against Sainte-Beuve") to show how conservative, how blind, how dangerous the critic's

theories were. Eventually, the project grew into the novel *Remembrance of things past*, separately from the essay which was never completed.

> [Sainte-Beuve's method] ignores what we learn through an acquaintance with ourselves anywhere beyond the shallow: that a book is the product of another self than that we display in our habits, in society, in our vices. If we want to try to understand that self, it is only by trying to re-create it within ourselves that we can reach this goal. We can not spare our heart this effort. This truth, we have to build it up.[5] [Proust, 1909, p. 221]

This theory expatiates on Arthur Rimbaud's word: *"Je est un autre"* (I is another) [Rimbaud, 1871], which came to replace Gérard de Nerval's *"Je suis l'autre"* (I am the other) [Gans, 1997]. According to Proust, recognizing "otherhood" in oneself is of the keys to creation.

A contemporary of Freud, the German poet and art theorist Rainer Maria Rilke saw a clear link between the existence of the unconscious and creation. In a letter to Lou Andreas-Salomé dated 1912, he writes:

> I know now that psychoanalysis would make sense to me only if I were to seriously consider the curious thought of *no longer writing*. [...] Then, it would be possible to exorcise the demons, which are indeed, in a bourgeois life, but an uncomfortable annoyance, and if the angels leave at the same time, it would also have to be considered a simplification and we'd have to admit that in this new job (which one?) there would not be any use for them anyway. [Rilke, 1994, p. 21]

Maybe out of fear of the demons of the unconscious, cybernetics and behaviorism ignored the angels and dismissed subjectivity. It seems that it was a mistake on many levels, and particularly because it threatened the very source of creation. The original concept of the rM site applied those theories: it was meant, indeed, as a non-creative production, a dry, scientific account of observable facts.

[5][Sainte-Beuve's method] méconnaît ce qu'une fréquentation un peu profonde avec nous-même nous apprend : qu'un livre est le produit d'un autre moi que celui que nous manifestons dans nos habitudes, dans la société, dans nos vices. Ce moi-là, si nous voulons essayer de le comprendre, c'est au fond de nous-même, en essayant de le recréer en nous, que nous pouvons y parvenir. Rien ne peut nous dispenser de cet effort de notre coeur. Cette vérité, il nous faut la faire de toutes pièces et... [Unfinished sentence. Quoted here in French because of the quality of Proust's language and the difficulty of the translation.]

It appears that the means selected to reach the primary goal of communicating my reality are, in fact, contrary to that goal. However, just as the options governing the site seem to prevent it from fulfilling its purpose, a new way opens simultaneously. Indeed, the presence of an intention bears in itself significance as to the personality in work. The very choices that were intended to factor my subjectivity have become its vessels.

A closer study of modern theories of creation in fields nearer online media might offer some interesting perspectives on the significance of the decisions that shape the rM web site.

III. Online experiments

The salvation of subjectivity and its recognition as an important feature of humanity is one of the characteristics of modern thought about literature, and more generally about art. But what consequences do such modern theories have in the domain of online creation?

a. A modern theory of creation

The theories of literary modernity have had their parallel in other forms of creation, such as film. And the birth of the technologies that made cinema possible is recent enough so that the transformation of the practice has been visible in a rather short period of time—a matter of a century, luckily well documented and commented upon.

The documentary

The French film critic André Bazin, who spearheaded the launch of the *Nouvelle Vague* movement in the late 1950s, was born less than a century after photography, and less than twenty years after the cinema. His private involvement with filmmakers and his deep theoretical work, notably as a founder and the editor of the influential *Cahiers du Cinéma,* helped define the *Nouvelle Vague* and its concepts. Federated under the general heading of doing away with academicism and moving on with the contemporary world. The new ideas were the basis of film as art in the post-World War II period.

One of those concepts was the shedding of the narrative and characters. Bazin notably advocated the value of documentaries as material that was worth being put on the screen. For example, he reviewed the documentary *Kon-Tiki*, shot by Norwegian scientists who wanted to prove that the populations of the South-Pacific archipelagos originate in South-America. To that end, they built a raft, on the basis of their knowledge of what technologies were available at the time, and boarded it. Their footage was made into a movie that was released in 1950. It was awarded the 1952 Oscar of the best documentary.

> In fact this sort of movies can only be a more or less efficient compromise between the requirements of action and those of reportage. The cinematographic testimony is what man was able to tear from the event which was at the same time requesting his participation. [Bazin, 1976, p. 34]

Bazin considers its involvement with reality an essential quality of the movie, contributing to its truth, to its evocative power. Proust defines modernity in creation by the roots it must recognize in the unconscious; Bazin, among other characteristics, by its interest in realism and reality.

The question of realism which opened this study is making its way back to center-stage. Bazin explains that *"reality, by the means of style, re-enters the conventions of art."* [ibid., p. 361] His point is that when an art form has at its command a means to convey reality, art is in how to use that reality. In a way, Bazin might have been interested in modern-day special effects, because they allow the viewer to enjoy a full formal realism: each scene is visually believable.

On the other hand, the use of "conceptually believable" scenes is increasing in the entertainment industry: full-length features such as *The Blair Witch Project* (1998) or reality TV shows like MTV's *The Real World* (1992) and Endemol's *Big Brother* (1999) are a media phenomenon, if not a genre. In the former attempt, the viewer is convinced of the reality of the show through cues that make the filming visible, such as seeing the camera in the action; in the latter, the viewer is told that what is shown is true, unrehearsed, through "informations" trickled down the media channels, despite of an obvious lack of realism of the situations. In both cases, the aim is to make the product more exciting, more engaging.

From information to action

The rM web site, in this setting, is not exactly trying to make a documentary about me. Such an attempt would probably fail, considering I am not ready to

put the right kind of resources behind the project, which would need an overall storyline, and thus some editing. The site is also meant to be dynamic and tending towards real-time, which is not compatible with making a traditional documentary.

Rather, the rM site is *covering*, as a news reportage could cover a live event, parts of my memory that are more or less related to my work, and the threads that my mind weaves with and around the memory.

Keeping tabs on the inbound flows, recording them for later reference; tracking the intermediary activity, the partial analysis and the sudden idea; and in the end, showcasing the results, whatever product I manage to output. From information to action, the processes themselves are not recorded, but some of their visible effects are, the clues that might lead to understanding them.

Thought processes may become interesting, when put between the context of their birth and their result. Anyone in the same line of work gets to compare notes with me, and a chance at understanding a choice that might not seem obvious in the final product. Indeed, this is the possibility to look into my notes, which are always organized, always neat, and rather accessible to the outsider.

b. Modeling memory

As it has been remarked in part I, the mode of organization of the rM site, in order to be efficient, has to be modeled on the structures and operating mode of the human memory. Such an attempt is far from new.

An existing form

Publishing work documents is indeed already quite common. Famous writer's notebooks are often edited, printed and commented upon, usually after their owner's death. The correspondence of artists is, too, a mine for whom is interested in their processes: they often explain parts of what they are working on, and courageous researchers can, by crossing the perspectives offered to different recipients, construct very interesting hypothesis. Proust's *Contre Sainte-Beuve*, for example, is partially reconstructed from the author's notes, and it is one of the major contributions to the modern definition of literary creation.

Filmmaker Chris Marker has been commissioned in the 1990s by the Pompidou modern art museum to create an installation around the theme of memory. One

of the final products was the CD-ROM *Immemory One*, which explores the memory of its author, both through the content presented, and through the interaction which is an attempt at modeling memory.

> He [Marker] did much of the cut-and-paste work as well as the graphic design himself [...]. This is part of the reason that this cd-rom does not satisfy the high expectations for it. A too-simple and distinctly ugly interface, awkward animations and a poor use of quasi-filmic effects make navigating through his postcard collection a much more static experience than you would expect from Marker. It seems as if, despite the ample time he took for this production, he expected too much of the medium himself. As if right at the end, looking back at a lucid and above-average oeuvre, he falls into the trap of media hype and as a new-media bricoleur lets himself be carried away by the vertigo of the technology. [van Weelden, 1999]

The CD-ROM suffers from its static nature: no one will believe that Marker's memory is static. But it does give a very insightful view of how he experiences his own memory. It also informs the viewer of the inspiration and influences that Marker recognizes, and although his production is not directly mentioned, there is a permanent, implied yet obvious reference to his job, which users are very likely to know in first instance.

The rM site has boldly attempted to tread the tracks of Marker, but with the definite head start of being a web application, dynamic in nature. Being an ongoing experiment, rather than a finished, edited product makes it more likely to succeed in modeling memory. The choice of a mainly text-based product also limit its ambition.

Memory as a practical metaphor

In his assessment of what cinema should be, Bazin mentioned that art was always a copy of nature, and that one had to find which aspect was specifically susceptible of being copied by cinema in order to answer the question. As a parallel and a foundation, he explored the essence of photography:

> [Photography inventor Nicephore] Niepce and most of the pioneers of photography meant to use it to copy engravings. They dreamed to produce artworks without being artists, by simple replication. A typically and essentially bourgeois aim. [...] It was natural that the model that seemed to photographers as most deserving imitation was the artwork, in that in their eyes it already imitated nature, "only better." It was a while before, becoming artists themselves, photographers began to understand they could only copy nature. [Bazin, 1971, p. 13]

The question that the rM site asks, in that regard, is that of the nature of the web, or rather the aspect of nature that the web can imitate. It is very clear that the web has copied visual arts for quite a while now, improving on the canvass

by adding animation and interaction. But the real breakthrough was there all along, right from the start, with the invention of the hyperlink[6]. It is a well-known phenomenon that memory associates notions together. Proust's *Remembrance of things past* is the repository of that knowledge, of search for keys that will bring memory back. Marker's CD-ROM shows that computer systems offer a medium for such linking, with hyperlinks or other artifacts of memory emulation.

One aspect of nature that the web can imitate is indeed memory and the related processes. Because the web implements one of the crucial mechanisms of memory, the arbitrary, symbolic linking and the ability to rebound from a notion to another. Also because, like memory, the web cannot be "too full," has not upper limit to the amount of information it can contain.

One might even argue that the occasional broken link, home-page defacing by hackers and the proverbial sluggishness of the medium are the counterparts of things forgotten, false or reconstructed memories and the sometimes low speed of information retrieval in the human brain.

However, Proust does mention that actively trying to support *"madeleine"* memories with mnemonic tricks is a doomed endeavor.

> Not only can intelligence do nothing for such resurrections, but those past hours vest themselves only in objects that intelligence did not attempt to use as vessels. The objects which you have tried to consciously link to moment you are living are not going to host that moment. And worse yet, if something else can revive them, they will be, when revived with that thing, devoid of poetry.[7] [Proust, 1909, pp. 212-213]

Another difficulty of web work is that for the time being, it is still technically difficult to create sites and other online products, which is not the case with literature. The entire burden of creation, for Proust and other writers, is in choosing the right word, and putting it in the right place. The web creator, on the other hand, still has to worry about a lot of strictly technical issues that make his success rely on precise knowledge whose recall has little to do with the

[6]BT (formerly British Telecom) has laid a patent claim to the concept of the hyperlink, and pressed for royalties from top internet access providers (BT vs. Prodigy, 2000). This encouraged researching for the origins of that concept, done by many people who oppose the concept of protecting basic ideas. For more details, see for example [Loney, 2002]

[7]Non seulement l'intelligence ne peut rien pour ces résurrections, mais encore ces heures du passé ne vont se blottir que dans des objets où l'intelligence n'a pas cherché à les incarner. Les objets en qui vous avez cherché à établir consciemment des rapports avec l'heure que vous vivez, dans ceux-là elle ne pourra pas trouver asile. Et bien plus, si une autre chose peut les ressusciter, eux, quand ils ressusciteront avec elle, seront dépouillés de poésie. [See note 5 on page 22]

creative process. Such technical challenges can be an opportunity for clever solutions and mastery, and in no way *excludes* creativity. Nonetheless, I believe that the bulk of the creative processes lie elsewhere in the field.

c. The web's raw material

Following Bazin's analysis of photography, memory has been identified as an aspect of nature that the web can attempt to copy. Such an attempt is the criterion that might redeem the rM site: it allows my unconscious back into the "product," which is then no longer a cold, inhumane homeostasis maintainer.

This representation of the input and output of my brain is showing what I feel are the most interesting characteristics of this medium.

In order to identify what is specific to this way of using the web, a comparison can be made with another personal presentation web site, "digital portfolio," one I was required to do in 1999 for school. It is composed of five static pages, and did not survive the lack of an easy maintenance tool. In fact, it has not been updated more than three or four times since it was put online, over two and a half years ago. The comparison's results will then be analyzed in the light of an imitation of memory, which was not at all the purpose of the digital portfolio.

The rM site's use of the web

The first obvious difference between the two sites is the amount of data. Intuitively, it seems obvious that with careful organization and satisfactory usability, any site is better with more information, with its past content as well as the recent material. There is indeed no upper limit to human memory, and the technical possibility to ignore an upper limit of stored information on a site should definitely be tapped to mimic this characteristic. Archive.org's popular "Wayback Machine" is a clear signal in this direction: web users are interested in successive strata of content.

Second proposal, and closely linked to the first, the need for dynamic information: the rM site is designed to be updated often, while the other's back-office was never plugged in, dooming it to be a group of static pages. The rM system encourages me to update it often, which is rewarding to frequent visitors as well. The keys to this are the ease of updating, but even more importantly choosing the right content. FontFaces is another school experiment, which presented cute Flash animations of font-based characters: it failed, because I

could not provide more of the flicks. The brains never tire of encountering and producing new elements: human curiosity is a very strong trait. It has to be mirrored on the web, by making the data of a site appear to be *alive*. Community web sites such as SlashDot.org have long known this fact, and thrive on the volume of content posted by their users.

Third proposal, multiple views: allowing multiple ways of accessing the information through different sorting methods and cross-linking makes sense. Each item should be accessible through as many channels as possible: through time-based overviews, topical listings and as a standalone element. All existing relationships must be made into links. Each item must be put in context whenever possible. In this regard, one improvement I am likely to add to the rM web site is time-linking: offering, for each element, links to items that were entered or updated just before or just after the current item. A good example of this multiplicity of access is forums: it is possible to follow a discussion thread, or to follow the chronological order of the posts. The many, many ways to arrive to a single memory and the mind's tendency to look for patterns must be copied: associating notions until we arrive at what we are looking for, or focusing on a face to find a name, or reminiscing the environment in which we know that the event occurred, etc. The experiments of Benjamin Fry[8] are also a step in this direction, albeit from the radically opposite perspective of visuals. But his representations of data are dynamic and evolving in nature, and intend to represent multiple points of view.

Fourth, open navigation: contrarily to some CD-ROMs or to movies, navigation on a web site cannot be constrained: the user always has control over the "back" button. They are free to go as they please, so the system should make sure that it is possible for them to tread their own paths in the information. Meaningful URLs give power-users a lot of control over their browsing, as do the consistent navigation aids that the rM web site displays. The key is that each screen is self-sufficient. Contrarily to the digital portfolio site, there is no argument being built over several pages, each page has a significance of its own, separate from other pages. In memory, each element is linked to others, but an elementary unit of remembrance or thinking is always self-standing, independent from other memories. The base unit on the web must therefore be the page, or the screen, but definitely not the site.

[8]At the MIT media lab's Aesthetics + Computation Group, under the supervision of John Maeda.

Final point, recycling: while the digital portfolio's pages are made once and for all, the application behind rM is designed in such a way that the content can be easily reformatted for a different output device or method, and that more types of content can be added rather simply. This ensures another important web characteristic: the re-use of content in new ways, and the possibility to add new formats in old distribution methods. The brains keep re-wiring itself to take on new challenges and adapt to new situations, so should a web site, without having to change the whole thing. Adaptive sites that were ready to be accessed over iMode or through Wap browsers could a different audience: as such, it was a creative evolution.

Those proposals are not meant as actual guidelines when setting up a site. They are merely suggestions to people involved in the creation of an online project, things to consider when one wants to tap the specific qualities of the medium.

Conclusion

In the perspective that the web has a special affinity with memory, the rM site proposes some ways to practically apply the idea. Their origin can be found in the initial intent of reality: modeling memory was meant as a method to factor the effect of my subjectivity. Limiting the subjective tainting was thought of as ensuring the validity, the accuracy of the image conveyed by the site.

Unfortunately, this quest for reality was shown to be ineffective. It even seemed to work against the goal of communicating my professional reality. However, the site nonetheless managed to give off an image of me at work, because the choices that shape the system carry direct traces of my subjectivity. In turn, subjectivity, when expressed through creation, becomes a proxy for one's vision of the work.

The form assumed by this presentation site allowed to identify memory as one natural trait that can serve as inspiration for online productions. A number of characteristics of the rM system could then be extracted as proposals for other web projects. The vision of data as the raw material for web creation could especially be interesting in other creations.

As a more direct answer to the initial question, it can be said that the rM web site illustrates a vision of my work dominated by memory. In turn, it also illustrates a vision of memory as a rational accumulation of facts in a multi-dimensional matrix of criteria, interwoven by the links that make knowledge out of information. Whatever content I may put in the site will not change this vision, which is mainly valid at the time of its creation. Its validity is confirmed

by the adequacy between what is stands for (my way of working) and how it is expressed (through a project of mine). For example, it would not have been properly expressed by someone else on my behalf. In this sense, it is truly an expression of me at work.

In a roundabout way, these findings permit to return to the question that was fueling my earlier research regarding the communication of personality within online work groups. The reliability of such indicators was important to the members of such groups: the first proposal was thus to define rules that could ensure a certain degree of objectivity. However, this research suggests instead that creating some kind of self-presentation device is a good way for someone to convey as much as possible about herself. Indeed, a lot of meaning, of professional vision, is conveyed through the sheer creative process. The actual content of such a device is in fact less significant than the choices that lead to its selection. Consequently, objectivity does not bring much value either.

It is the very act of looking that bears significance. The most successful way of communicating oneself must not try for neutrality or assumed objectivity, but on the contrary, it must stage its subjectivity. For subjectivity is the defining bit of creative people, and must be treasured as such.

Bibliography

André **Bazin**, **1971**, *Qu'est-ce que le cinéma ?*, Paris, Le Cerf

Philippe **Breton**, **1995**, *Histoire de l'informatique*, Paris, La Découverte

Philippe **Breton**, **1997**, *L'illusion de la communication*, Paris, La Découverte

Guy **Debord**, **1967**, *La Société du Spectacle*, Paris, Éditions Buchet-Chastel

Philip K. **Dick**, *Service Call*, **1954**, and *If There Were No Benny Cemoli*, **1963**, in *Minority Report*, Millenium/Victor Gollancz, 2001

Philip K. **Dick**, *Ubik*, **1969**, Garden City, N.Y., Doubleday

Zoltan **Dienes**, Josef Perner, 1999, *A Theory of Implicit and Explicit Knowledge*, in *Behavioral and Brain Sciences*, Cambridge, UK, Cambridge University Press

Sigmund **Freud**, **1949**, *An Outline of Psycho-Analysis*, New York, W. W. Norton & Company

Benjamin **Fry**, **2000**, *Organic Information Design*, Master's Thesis, http://acg.media.mit.edu/people/fry/thesis/, retrieved on 12/8/2002.

Eric **Gans**, **1997**, *Models of Identity*, in *Chronicles of Love and Resentment*, http://www.anthropoetics.ucla.edu/views/vw103.htm, retrieved on 12/8/2002

William **Gibson**, **1996**, *Idoru*, New York, G. P. Putnam's sons

Humberto **Gutierrez**, Christopher **Ormsby**, **2000**, *Memory*, in *A brief introduction to the Brain*, Mexico, Instituto de Fisiologia Celular, UNAM, http://ifcsun1.ifisiol.unam.mx/Brain/memory.htm, retrieved on 12/8/2002

Steve **Heims**, **1982**, *John von Neumann and Norbert Wiener*, Cambridge, Massachusetts, The MIT Press

Michel **Leiris**, **1934**, *L'Afrique Fantôme*, Paris, Gallimard

Michel **Leiris**, **1939**, *L'Âge d'homme*, Paris, Gallimard

Le Monde, **2002**, *Le Style du "Monde"*, Paris

Jean-François **Le Ny**, **2000**, *Behaviorisme*, in *Encyclopedia Universalis*, Paris

Alain **Lieury**, **2000**, *Mémoire*, in *Encyclopedia Universalis*, Paris

Don **Locke**, **1971**, *Memory*, MacMillan

Matt **Loney**, 03/14/**2002**, *BT hit with ruling in patent case*, in *News.com*, http://news.com.com/2100-1033-860407.html, retrieved on 12/8/2002

Deborah J. **Mayhew**, **1992**, *Principles and guidelines in software user interface design*, Prentice Hall

Roger **McCain**, **1997**, *Measuring Benefits*, in *Essential Principles of Economics*, http://william-king.www.drexel.edu/top/prin/txt/MBch/Eco440.html, retrieved on 12/8/2002

Marshall **McLuhan**, 1964, *Understanding Media: The Extensions of Man*, New York, McGrawHill

Jakob **Nielsen**, **2000**, *Designing web usability, the practice of simplicity*, Indianapolis, New Riders Publishing

Edwy **Plenel**, 01/13/**2002**, *Le Style du "Monde", un contrat de lecture*, in *Le Monde*, Paris

Marcel **Proust**, **1909**, *Contre Sainte-Beuve*, in *Œuvres complètes*, 1971, Paris, Gallimard / NRF / Bibliothèque de la Pléiade

Michael **Renov**, **1995**, *New Subjectivities, Transformations in film as reality*, in *Documentary Box*, Yamagata International Documentary Film Festival, http://www.city.yamagata.yamagata.jp/yidff/docbox/7/box7-1-e.html, retrieved on 12/8/2002

Rainer Maria **Rilke**, **1994**, *Lettres à un jeune poète et autres lettres*, Paris, Garnier Flamarion

Arthur **Rimbaud**, **1871**, Letter to A. P. Demeny, http://www.poetes.com/rimbaud/voyant.htm, retrieved on 12/8/2002

Marthe **Robert**, **2000**, *Freud*, in *Encyclopedia Universalis*, Paris

Brigitte **Schroeder-Gudehus**, **1978**, *Les scientifiques et la paix*, Montréal, Les Presses de l'université de Montréal

Burrhus F. **Skinner**, **1957**, *Verbal Behavior*, New York, Prentice Hall

Endel **Tulving**, **1984**, *Precis of Elements of Episodic Memory*, in *Behavioral and Brain Sciences*, Cambridge, UK, Cambridge University Press

Alan **Turing**, **1950**, Computing and machinery intelligence, in Mind, a quarterly review of psychology and philosophy, Oxford, Oxford University Press

Willem **van Weelden**, **1999**, *Marker (Immemory One)*, in *Mediamatic*, http://www.mediamatic.net/cwolk/view/2637, retrieved on 12/8/2002, Translation Laura Marz

John **von Neumann**, **1958**, *The Computer and the Brain*, New Haven, Yale University Press

John **Watson**, **1913**, *Psychology as the behaviorist views it*, in *Psychological Review*, vol XX

Norbert **Wiener**, Arturo Rosenblueth, Julian Bigelow, **1943**, *Behavior, Purpose and Teleology*, re-published in *Modern systems research for the behavioral scientist*, edited by W. Buckley, 1968, Chicago, Aldine

Norbert **Wiener**, **1948**, *Cybernetics, or Control and Communication in the Animal and the Machine*, Cambridge, Massachusetts, The MIT Press

Dominique **Wolton**, **1999**, *Internet, et après, une théorie critique des nouveaux médias*, Paris, Flammarion