The death of paper
(which never happened).

1.1   EARLY THREATS TO THE PRINTED MEDIUM.

In our present digital era, the 'death of paper' has become a plausible concept, widely expected to materialise sooner or later. The 'digitisation of everything' explicitly threatens to supplant every single 'old' medium (anything carrying content in one way or another), while claiming to add new qualities, supposedly essential for the contemporary world: being mobile, searchable, editable, perhaps shareable. And indeed, all of the 'old' media have been radically transformed from their previous forms and modalities – as we have seen happen with records, radio and video. On the other hand, none of these media ever really disappeared; they 'merely' evolved and transformed, according to new technical and industrial requirements.

The printed page, the oldest medium of them all, seems to be the last scheduled to undergo this evolutionary process. This transformation has been endlessly postponed, for various reasons, by the industry as well as by the public at large. And so the question may very well be: is printed paper truly doomed? Are we actually going to witness an endless proliferation of display screens taking over our mediascape, causing a gradual but irreversible extinction of the printed page?

It's never easy to predict the future, but it's completely useless to even attempt to envision it without first properly analysing the past. Looking back in history, we can see that the death of paper has been duly announced at various specific moments in time – in fact, whenever some 'new' medium was busy establishing its popularity, while deeply questioning the previous 'old' media in order to justify its own existence. In such moments in history, it was believed that paper would soon become obsolete.

(Historical note: paper as a medium was first invented by the Egyptians around 3500 BC using the papyrus plant, then definitively established in China starting in the 2nd century CE, before it was combined with the revolutionary movable type print technology – first introduced, again in China using woodblocks, and later on by Gutenberg in Germany in 1455 using lead alloys).

Time and again, the established mass-media role of paper has been

called into question by a number of media theorists and marketing experts, who attempted in various ways to persuade society at large to get rid of paper, and choose instead some newer and supposedly better medium. This ongoing process seems to have originated in the early 20th century, when the death of paper was predicted – probably for the first time – after centuries of daily use. The development of public electricity networks, which enabled the mass distribution of new and revolutionary media, inspired visions of a radical change in the (still two-dimensional) media landscape, following a fashionable logic of inevitable progress which lives on to this day.

White House telegraph room, Washington, D.C., ca. 1906
(Peter and Cornelia Weil Typewriter Archives)

The telegraph, introduced in the second half of the 19th century, was the first medium to enable the electrical transmission of content across long distances in real time. Despite a very low 'bandwidth' of just a few characters per second, this instant connection between faraway places completely changed the way people dealt with information, starting off the 'electric' wave of innovation which came to characterise the turn of the century. The journalist Tom Standage, writing in *The Economist*, went so far as to dub the telegraph "the Victorian Internet": "The telegraph unleashed the greatest revolution in communications since the development of the printing press".[2]

After the electric telegraph wire, the next step was the quest for what the Italian inventor Innocenzo Manzetti called the "speaking telegraph",[3] and soon enough the first telephone networks were being developed – first locally, then nationally and internationally. The 'one-to-many' mode of exclusive communication (introduced by the newspapers) was now being challenged at its very core, by the wires directly connecting voices between people's houses – that is, between rich people's houses, at least for the time being.

A uniquely futuristic vision of this changing mediascape was elaborated by Octave Uzanne and Albert Robida in their illustrated story *La fin des livres*, originally published in France in 1894 in the collection *Contes pour les bibliophiles*.[4] Uzanne wrote of a future world of publishing which would no longer rely on the 'static' printed page, delivering instead all content through voice (both live and recorded) using a platform which nowadays would best be described as 'on demand'. This wasn't radio (wireless transmission had yet to be developed and popularised), neither was it any kind of telephone broadcasting (or, as we would say in contemporary terms, 'cable radio') since it relied on live-through-wires content as well as playback of recorded content (which we would now refer to as online and offline), distributed through the then-popular (and fragile) cylinder recording medium. Robida's illustrations depicted

One of the illustrations from *La fin des livres* by Octave Uzanne and Albert Robida in *Contes pour les bibliophiles*, 1895

this future world in a very imaginative and effective manner, while maintaining the distinctive graphic style of the period. The future seemed to be one of wires everywhere, spreading the content of libraries into every home as well as in public spaces.

Uzanne argued that reading causes fatigue and apathy. Words heard through the tube, on the other hand, would convey energy, and thus the gramophone must inevitably supplant the printed page. The way in which Uzanne imagined this future scenario, anticipates several contemporary issues regarding the distribution of content. Watchmakers, for example, will have designed reliable miniaturised gramophones (= iPods); the required mobile electricity (still an issue in the 21st century) is generated by harnessing the user's physical movements (one of many contemporary 'green' proposals for producing clean energy). The libraries have become "phonographoteques" (= podcast repositories), while bibliophiles are now known as "phonographophiles" (= download addicts). Furthermore, in Uzanne's vision, the author becomes his own publisher (= customised print on demand), living off the royalties of his works. Finally, city squares and crossroads now feature kiosks where people can insert a coin in order to listen to works of

literature (= digital kiosks) through simple headphones which are so cheap even the poor can afford them. One of the most 'retrofuturistic' inventions is a more-or-less mobile device, filled with recordings of the author's works, which he can carry with him through the streets. Using multiple wire connections, a small neighbourhood can be 'provided' with his audio content.

As for the future of the printed page – "It will be abandoned", except perhaps for some limited use in business and private communications (actually, what we see happening nowadays is exactly the opposite: since the mid-1990s, personal communication has relied less and less on paper, except in a few formal occasions). Also, "the newspaper will go the same way", since the printed word would no longer be satisfying compared to the new audio medium – and the thrilling experience of hearing the story actually being told.

There's also a passage on health issues, specifically on the results of centuries of reading in poorly-lit conditions. Uzanne notes that, just as eye doctors flourished when journalism was invented, ear specialists will prosper in the future. He concludes: "how happy we will be not to have to read any more; to be able finally to close our eyes". The daily strain on the eyes from devouring news and essays, stories and novels, could at last be avoided as the ears absorbed the information, much faster and almost effortlessly. For Uzanne, the death of print positively meant the end of a tyranny – the liberation from a debilitating slavery of the eyes. And so the new medium (catapulting us with its new sensorial experience into a future of speed and ease) would inevitably prevail against the slow and static printed page (and its dependence on our enslaved and exhausted eyes).
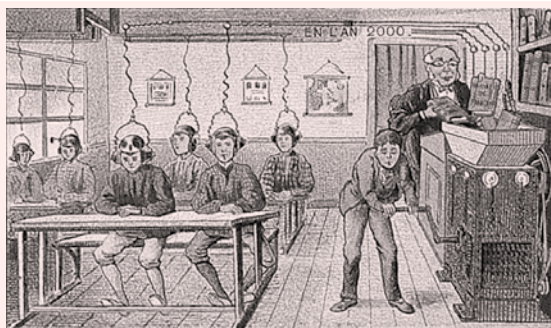
One of the postcards
from the series
*Villemard 1910 -
en l'an 2000*, 1910

Similarly, the French artist Villemard created in 1910 a series of postcards showcasing his futuristic vision of life in Paris in the year 2000.[5] Here the concept of one medium (paper) being replaced by

another (audio) is depicted even more explicitly. We see people listening to their favourite newspaper, in the form of freshly recorded cylinder phonographs played on a gramophone; the same medium is also used for personal correspondence. Schoolchildren hear their lessons through rudimentary headphones hanging from the ceiling and connected to a mysterious machine, which the teacher feeds with books, converting their content to audio through some unspecified mechanical process (somewhat resembling the grinding of meat). But although the content is converted (into immaterial sounds rather than digital bits), the supremacy of the book as the primary repository of knowledge is in itself not challenged.

1.3 *THE READIES*:
MACHINE-READING WORDS WITHOUT PAGES.

In the early decades of the 20th century, the structural constraints of the printed page (content fixed immutably in a strictly sequential order of pages) were increasingly being perceived, after a few centuries of established use, as merely a technical limitation − something which would soon and inevitably be overcome. The avant-garde artistic and cultural movements of this period embraced the dramatic acceleration of urban daily life − the result of the industrial revolution and the increasing use and availability of electricity. Newly created requirements (speeding up processes, reconfiguring social structures, and finding new attitudes for coming to grips with these changes) affected also the printed page, a cultural symbol of the past as well as the (then) present age.

This is the background against which Bob Brown wrote his manifesto *The Readies* in 1930. Declaring that "the written word hasn't kept up with the age", Brown envisioned a completely new technology for speeding up the reading process, using strips of miniaturised text (instead of pages) scrolling behind a magnifying glass: "A simple reading machine which I can carry or move around, attach to any old electric light plug and read hundred thousand word novels in ten minutes if I want to, and I want to."

Not content with merely conceiving the technology, Brown took a first step towards its realisation, by defining a new publishing platform meant to supplant what he called the printed book's "bottled" text. One year after *The Readies*, he published *Readies for Bob Brown's Machine*, featuring texts written specifically for his new reading machine by celebrated contemporary poets such as Gertrude Stein, Filippo Tommaso Marinetti and Ezra Pound − in an experimental

style reflecting the machine's structure and motion, using only indispensable words connected by hyphens and discarding the rest (such as articles and conjunctions).[6]

The Readies were meant to be more than a new form of writing – Brown envisioned a whole new medium, optically demolishing the obsolete pace of words "bottled up" in the printed page, and thus increasing the quantity of information that could be digested per unit of time (readers could control the scrolling speed according to their own personal tastes and needs): "Books are antiquated word containers (…) modern word-conveyors are needed now, reading will have to be done by machine". Impressively prophetic of the speed of the electronic word ("And words perhaps eventually will be recorded directly on the palpitating ether") and of the speed and range (and thus power) of electronic media, Brown's work also questions the relationship, in the established written forms and media, between writer and reader.

The basic technology sounds a lot like microfilm, which was then in development, and in fact Brown was in contact with some of the inventors working on prototypes. Paradoxically, this was the only form in which Brown's vision would ever be materialised – microfilm, which became a way of archiving printed content, celebrating and preserving paper and print rather than attempting to supplant them.[7]

1.4   H.G. WELLS DECLARES THE NEWSPAPER DEAD:
        UP-TO-DATE NEWS BY TELEPHONE IS THE FUTURE.

The English author Herbert George Wells is widely considered one of the spiritual fathers of science fiction (together with Jules Verne); his many works in the genre include such seminal titles as *The War of the Worlds* and *The Time Machine*. During the 1930s and 40s Wells appeared in regular radio broadcasts on the BBC, discussing "topics as diverse as world politics, the history of the printing press, the possibilities of technology and the shape of things to come".[8] Wells was a passionate believer in the essential role of the printing press in bringing knowledge to ordinary people; in a 1940 broadcast[9] he discussed the importance of print for democracy, and how the ability to read and write enables us all to become "lords and masters of our fate". And yet, only three years later (and just three years before his death), during another broadcast[10] he declared the newspaper medium to be "dead as mutton". He denounced the excessive amount of power concentrated in the hands of an unreliable press and the "prostitution" of the journalistic profession, which made it necessary to buy "three or four newspapers to find out what is being concealed from us"; he also

jokingly advocated mass book burnings in order to rid local libraries of low-quality and out-of-date publications. Finally, he predicted that people would soon prefer to receive a constantly updated news summary through their telephones…

1.5 AN ATTEMPT BY RADIO TO STEAL NEWSPAPERS' LOYAL CUSTOMERS.

Within a few decades, electricity made possible first the telegraph, then the telephone, and finally radio, with its own entirely new model of broadcasting. The telegraph and the telephone were both designed to connect two single points at any given distance (in the case of the telegraph, with a slight delay between transmission and reception, but with an archival paper output; in the case of the telephone, in real time, but without any archival record). Radio, on the other hand, enabled for the first time an essentially real-time mass-media distribution of information, which until then had been the exclusive domain of big newspapers using a completely different medium. But even beyond its dynamic delivery of content, radio created in many listeners a sense of involvement, even a feeling of sensorial immersion: " 'I live right inside radio when I listen. I more easily lose myself in radio than in a book,' said a voice from a radio poll." (Marshall McLuhan, Understanding Media, 1964[11])

So it seems that the potential of voice as envisioned by Uzanne was realised thanks to radio, "with its power to turn the psyche and society into a single echo chamber" (McLuhan, Understanding Media[12]). But here again, the predicted catastrophic consequences for the printed page simply did not happen. In the 1940s, in particular (a period when radio was more popular than ever and still gaining momentum) newspapers nevertheless went on increasing their circulation. Customers seemed to enjoy the ritual of buying the morning (and often also the evening) editions from their favourite newsstands. And yet, during this period, the debate continued about how radio news was destined to inevitably supplant newspapers.

Then, in 1945 in Manhattan, a series of events took place which can be considered particularly significant in the social history of print. On June 30, a newspaper delivery drivers' strike broke out in New York, which was to last for 17 days.[13] A documentary funded at the time by the newspaper publishers' association showed what happened when thirteen million New York citizens were suddenly unable to buy their favourite newspaper. An early response to this development was that the radio stations doubled their news schedules, with programmes

every hour, twenty-four hours a day. The whole episode was soon a national event, with Mayor Fiorello LaGuardia reading a Dick Tracy comic strip over the radio for the 'kiddies'.

On the other hand, many newspaper customers reacted to the strike by phoning the newspapers, who reassured them that they were still being published daily, and that people could still obtain a copy by going themselves to the newspapers' printing presses, which loyal customers started doing. On the first day of the strike, circulation of the *Herald Tribune* plummeted to 15,000 copies, but after a massive word-of-mouth campaign, circulation was back up to 65,000 copies by the last day of the strike, "by far the greater portion of them in direct over the counter sales. The Tribune readers have taken the time and trouble to come far out of their way to get a copy of their favourite morning newspaper".[14]

Circulation of the *New York Times* rose from 38,000 on the first day of the strike to 210,000 on the final day. Other major newspapers of the period, such as the *New York Sun* and the *New York World Telegram*, also saw hundreds of customers waiting patiently outside their respective presses, in orderly queues up to 17 blocks long, for as much as two to three hours.

It seems people preferred the physical and delayed enjoyment of the printed word above the real-time radio signal, to the extent that thousands of customers were ready to spend a great deal of time and energy just to obtain their copy, instead of simply switching on the radio and waiting for the latest news update to come in through the ether. As the documentary's narrator says: "Newspapers that can be read and re-read, newspapers in which the public can read all about it, in their own time, at their own convenience". Near the end of the documentary, the narrator (triumphantly) states: "Once again dramatic proof has been given that no other medium can take the place of newspapers in the lives of the people."[15]

1.6   THE 'COLD' VISUAL POWER OF TELEVISION VS.
        THE 'DEAD' BOOK AND THE 'MOSAIC' OF THE NEWSPAPER.

After the age of radio, the next technology to make its appearance in the media arena was television, with its unique, hypnotic, reality-like video streams. For our society, this was a culmination of the electric revolution that had begun with the telegraph. Television was a new medium in real time, and until the late 20th century it remained the most pervasive and predominant of all media. Marshall McLuhan's

seminal analysis of a new media-innervated world, written in the 1950s and 1960s, is based upon an analysis of the various (mass) media and their changing roles in a new society which had evolved from industrial-physical relationships to an information-media relationship. As McLuhan stated:

"The term 'communication' has had an extensive use in connection with roads and bridges, sea routes, rivers, and canals, even before it became transformed into 'information movement' in the electric age. Perhaps there is no more suitable way of defining the character of the electric age than by first studying the rise of the idea of transportation as communication, and then the transition of the idea from transport to information by means of electricity."[16]

The mass scale achieved by television in the 1960s gave it an unassailable position in all industrialised nations, reflecting the emerging 'global village' through an electric (and thus instantaneous) distribution of information – in striking contrast with the centuries-old model of the physical printed page, which seemed unable to compete because of its physical limitations. The shared feeling of 'global interconnectedness' through a real-time video transmission was something the printed page had never been able to provide. At this point in history, as a fascination with speed and progress was transforming people's perception of time and space, the printed medium seemed simply too slow to allow information to be simultaneously diffused and consumed.

McLuhan, the most visionary of mass-media theorists, spent his life analysing media. His famous division of 'cold' and 'hot' media assigned to print a very low potential for audience participation: "typography as a hot medium involves the reader much less than did manuscript", while on the other hand "TV as cool media involve(s) the user, as maker and participant, a great deal."[17] He regarded the book as no longer adequate in this new age of speed and electricity, and thus ultimately doomed:

"It is the almost total coverage of the globe in time and space that has rendered the book an increasingly obsolete form of communication. The slow movement of the eye along lines of type, the slow procession of items organized by the mind to fit into these endless horizontal columns – these procedures can't stand up to the pressures of instantaneous coverage of the earth."[18]

McLuhan was sharply criticised for his determination to discredit the book as a valid form of media. Harry J. Boyle, writing in the *Ottawa Citizen*, commented: "He was ridiculed for saying that books were dead even as he used them to convey his ideas. Actually he never said that books were dead but rather that they had been nudged from their

central role by other media."[19] Nevertheless, McLuhan had an entirely different opinion of newspapers and magazines, noting how they flourished after the arrival of the new TV medium: "One of the unexpected effects of TV on the press has been a great increase in the popularity of Time and Newsweek. Quite inexplicably to themselves and without any new effort at subscription, their circulations have more than doubled since TV." And even more importantly: "If telegraph shortened the sentence, radio shortened the news story, and TV injected the interrogative mood into journalism."[20]

In fact, the new globalisation process was gradually incorporating print as well, and transforming it once again. Full-page facsimile transmission of international newspapers over long distances, which began in the 1960s and was upgraded in the following decades using dedicated satellite links, allowed newspapers to overcome the problem of shipping delays by printing remotely in different places at the same time. This new and forced evolution of print, along with its role of reflecting the uncertainty of a rapidly changing world (whether in the pondered style of the book, or the freeze-frame of the newspaper) is actually what allowed it to survive. Furthermore the stable, archival role of the printed page, and its potential for endless and exact duplication (qualities dismissed by McLuhan) were powerful features, especially in contrast with the volatility of the upcoming electronic media. Print never failed to reach its faithful audience, whether in the closed and portable form of a book, or in the 'mosaic'[21] and dynamic form of a newspaper or magazine.

1.7   COMPUTERS VIRTUALISING PAPER:
        THE 'PAPERLESS' PROPAGANDA.

At some point in history, someone may well have asked: *What's wrong with paper?*. It's no accident that this is the title of the second chapter of a book by Abigail J. Sellen and Richard H. R. Harper called *The Myth of the Paperless Office*,[22] about paper and its place in office life. From the very beginning, paper has always played a predominant role in the office. Historically, even Thomas Alva Edison, attempting to envision a practical use for his early experiments in recording on cylinders, saw them as a 'paper-reducing' (as opposed to 'paper-replacing') medium. The cylinders, wrapped in their thin aluminium foils, would contain spoken letters and memos to be shipped to their recipients, thus reducing paper use and speeding up the writing and typing process.[23]

Vannevar Bush, in the context of his complex *Memex* system, also imagined microfilm (used as the first alternative medium for

'virtualising' paper) as a means of mass storage and retrieval, reducing space and making data searchable using computers and cameras. And the limits of paper were also addressed in the early decades of computer science by J.C.R. Licklider in his famous book *Libraries of the Future*, published in 1965. Licklider sketched a futuristic impression of computer-based technologies (including pen input and speech recognition) combined in order to make information easily searchable, and to overcome the inescapable limitations of paper, mainly its size and weight.[24]

Fujitsu
ScanSnap ad, 2007

We can trace the actual expression 'paperless office' back to an article titled *The Office of the Future*, published in *Business Week* in June 1975.[25] The second section of the article is titled *The Paperless Office*. Besides predicting how computing giants (IBM and Xerox) would dominate the office market until the end of the century, this section looks into electronic methods of managing information which were expected to reduce, progressively but drastically, the amount of paper used in the working environment. The section begins with a quote

from George E. Pake, then head of Xerox Corp.'s Palo Alto Research Center (PARC):

> "(…) in 1995… I'll be able to call up documents from my files on the screen… I can get my mail or any messages. I don't know how much hard copy (printed paper) I'll want in this world."

Starting in the early 1980s (the beginning of the age of personal information) this 'paperless' research-and-development mantra would increasingly become a propaganda buzzword aimed at creating a large target market for selling information technology (IT). Marketing departments actively promoted a vision of massive magnetic archiving systems, destined to replace the huge amounts of messy paper, effectively de-cluttering the desktop once and for all. This meant a definitive shift towards systems of digital documents, existing only in windows on computer screens.

But every IT user sooner or later experiences some substantial data failure – and this unavoidable 'IT error' paradigm effectively undermines any possible faith in an entirely digital model. It was also a historical miscalculation to consider this 'virtualisation' process solely from a perspective of digital production, instead of attempting to understand how to enhance well-established paper-based dynamics. What all the propaganda aimed to evoke – the eradication of the jungle of paper from the clean and orderly industrial interface – was thus undermined by the instability of the new technology, as well as people's familiarity with paper-based communication methodologies.

Sellen and Harper deconstruct the 'paperless' propaganda, stating that: "We have heard stories of paperless offices, but we have never seen one. (…) For example in one organization, managers banned the use of personal filing cabinets, only to find that people resorted to using their car or home offices to store their paper files." In fact, it should be noted that 'paperless' has remained a recurring propaganda theme ever since – promising to not only get rid of unwanted stacks of paper, but also (and perhaps more fundamentally) to reclaim physical space.

But the types of interaction made possible by paper are not yet available through new technologies (nor vice-versa, for that matter). There is still no electronic device which reproduces all the characteristics of paper: being lightweight, foldable, manipulable according to various reading activities, easily shareable with a small group of people interacting with each other simultaneously using a single medium, and being able to easily contain very different types of content, all instantly generated by hand, or juxtaposed with prepared (reproduced) content.

In fact, it seems much easier to digitally simulate the limitations of paper than its strengths – and this is unlikely to change any time soon.

For example, the 'readability' of paper seems very important to us: most people still choose to print a long document and read it on paper, rather than read it on a screen. So not only did the paperless office fail to happen, but the production and use of paper, both personal and work-related, and generally speaking the printed medium, have actually increased in volume. Paradoxically, paper has even significantly contributed to spreading the culture and consciousness of the new media. Paper is persistent, as is the ink printed upon it. Printed paper stays around for a very long time, and its content doesn't change at the click of a button. Furthermore, we have the experience of a few thousand years of practice in reading externally illuminated paper. Since the 1990s, paper documents, rather than simply being supplanted by their electronic alter egos, are instead finding new ways to interact with them. So again: what's wrong with paper?

1.8   HYPERTEXT, SOMETHING PAPER CAN'T BE.

The way we deal with reading and writing practices has in fact been literally revolutionised, not so much by a new medium, but rather by a new concept implemented within a new medium. It's not the computer itself which has forever changed the linearity of text – it's the possibility, through software, of creating in the abstract digital space a functional, entirely new text structure: the hypertext. Starting in the mid-1980s, the arrival of offline hypertexts signalled a radical change, which was to have a profound effect on the concept of the literary work. In fact, the hypertext enabled the realisation of an essential new characteristic: non-linearity of text. The consequence of this was a existential threat to the integrity of the sequential work, as it had been presented for centuries in books. And even though literature is still the main field for experimentation and innovation in print, the arrival of the hypertext enabled, perhaps for the very first time, a characteristic which could not effectively be reproduced in print.

Robert Coover clearly and authoritatively described this phenomenon in his seminal essay *The End of Books*: "Print documents may be read in hyperspace, but hypertext does not translate into print",[26] and so the endlessly deep narrative space made possible by the hypertext seemed destined to supplant the finite, sequential and closed format of books, eventually making them altogether obsolete. According to Coover, the 'superior' form of the hypertext brings "true freedom from the tyranny of the line" – particularly so in the case of narrative-based

text. When the boundless cultural space of the 'hypertextual' global Web is finally opened up, will the printed page by comparison start to look like so much yellowed paper?

The acclaimed Spanish author Jorge Luis Borges imagined such a dizzyingly endless text, in his 1975 short story *The Book of Sand*: a book with no beginning or end, its pages numbered, apparently uniquely but following no discernible pattern, so that the reader can never find the first or last page (the book was purchased from a book-seller who acquired it in exchange for a handful of rupees and a Bible, from an owner who did not know how to read).[27]

In his essential 1994 book *Hyper/Text/Theory*, George P. Landow said of the hypertext phenomenon: "It promises (or threatens) to produce effects on our culture, particularly on our literature, educa-tion, criticism and scholarship, just as radical as those produced by Gutenberg's movable type."[28] The digital technology then begins to radically alter the way in which we read, as the Brazilian media artist Giselle Beiguelman explored in a 1999 online artwork called *O Livro depois do Livro* ('The Book after the Book'). The different roles assumed by the machine ('reader' in the case of browser software, 'writer' in text-generating software, and 'interface' between reader and text) are here theoretically and functionally integrated. In Beiguelman's own words: "From screen to screen, the letter migrates, de-contextualises itself, making of language an aesthetic problem."[29]

And yet, despite its widespread use and incontestably tremendous potential (an early hypertext system for the authoring of technical manuals was appropriately called *PaperKiller*[30]), the hypertext has not yet succeeded in supplanting the 'traditional' text. The development of various 'wiki' platforms has dramatically expanded the hypertext's possibilities for collective authorship and the compilation of resources. It's clear that the hyperlink is now definitely embedded in our culture – on the other hand, the concept and implementation of hyperlinks are extremely computer-specific and unrelated to any established proce-dure used in traditional writing and publishing. We're nowhere close to hypertexts replacing the printed page in the way Robert Coover envisioned: "Indeed, the very proliferation of books and other print-based media, so prevalent in this forest-harvesting, paper-wasting age, is held to be a sign of its feverish moribundity, the last futile gasp of a once vital form before it finally passes away forever, dead as God."[31]

And yet, less than two decades later, books and magazines (whether traditional or in some mutated form) still abound; the most dramatic effect of the hypertext seems to be the way it enables the development of extraordinary new resources, with profound repercussions on a

number of specific types of publishing. In this sense Katherine Hayles seems to have forecast much more accurately the future development of trends which were already emerging as she was working on her book *Writing Machines*: "A print encyclopedia qualifies as a hypertext because it has multiple reading paths, a system of extensive cross-references that serve as a linking mechanism, and chunked text in entries separated typographically from one another."[32]

If this sounds like the perfect background for the development of Wikipedia, it should be noted that Wikipedia itself has recently implemented a new functionality for generating traditional 'printed page' layouts for its entries.[33] (On the other hand, the makers of the *Encyclopedia Britannica* announced in 2012 that they would be discontinuing their expensive and bulky print edition, after 244 years – though Encyclopedia Britannica, Inc is still very much in business, specifically in the fields of educational publishing and online educational tools.[34])

1.9   THE DEATH OF PAPER… HAS YET TO HAPPEN.

So the death of paper – in retrospect, one of the most unfortunate and embarrassing prophecies of the information age – has obviously not happened. Various kinds of printed pages are still being produced in huge quantities, and globally distributed, on a mass scale as well as on a very personal level. Nevertheless, the role of the printed page has radically mutated, from being a prevalent medium in its own right, to being a complementary medium, sometimes used as a static repository of electronic content.

The printed page has become more valuable, less expendable. This is because the duplication processes associated with paper are still limited and costly, and take up both space and time. Making a physical copy of a book involves either reproducing it page by page – or printing it from a digital file, again page by page. The result is a stack of paper occupying a significant physical space, and space seems to have become one of the most valuable resources in our consumption-oriented age.

Electricity, radio, TV, computers and the World Wide Web have all affected, transformed and revolutionised the printed medium in various ways; still, our attachment to the particular characteristics of paper remains more or less intact. Nevertheless, networks are radically changing the way paper is produced and consumed. Editors, for example, must now select their printed content much more carefully, because of the huge amount of free content available online.

Actually, paper and pixel seem to have become complementary to each other; print is increasingly the medium of choice for preserving the 'quintessence' of the Web. The editor of printed material is the curator, the human filter, the one who decides what should be saved on a stable medium, and what should be left as a message in a bottle tossed into the sea of the Internet. So the printed page, with its sense of unhurried conclusiveness, allows to the reader to pause, to reflect, to take notes, without having to rely on electricity. And paper is also being used to preserve a substantial part of the digital culture, independently of hardware or software, describing the new media from the technical perspective of an old medium.