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*Usable / Non-usable / Reusable.  
Present continuous of microfilms.*  
- Discussion paper -

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### Abstract

The technology of microfilm was one of the many technical improvements of the 19th century, which combined the advances of photography to fix images with the microscope optics to reduce them. Since then, microfilming has spread slowly in quite particular fields. Embraced by spies, shaped by librarians, loved by genealogists, microphotography presents a paradox as the basis of its survival: while the conservation of documents is probably its main goal, access to the information may be its principal obstacle. Almost like a riddle, each reel may contain hundreds of documents, but they cannot be read without the proper device.

Our aim is to tackle microfilming from the perspectives of media archeology and microhistory, i.e., looking for small stories and affairs related to this imaging technique, which can still be found in the 21st century.

That is why we would like to focus on three matters of this media: the traditional uses of microfilm for archival purposes, considering both successful and unsuccessful cases of information recovery; the appropriation of the technique by espionage in the context of Cold War, and its representation in films; and the use of microphotography in jewelry and ornaments, both in the past and the present.

**Keywords:** microfilm, technology, archives, material culture.

## **Introduction**

Last year, I visited the U. S. Library of Congress, where I had the opportunity of reviewing (better said, reinforcing) my perspectives on microfilming. When I asked Mr. Jay Sweany, Head of the Microform Reading Room, if we could consider this technique as obsolete, he answered quietly “no, it is necessary”. Certainly, we keep billions of documents in microphotography. Even more, some information is only available in this format. During the 20<sup>th</sup> century, there have existed several and large programs to microfilm paper-based documents, both of printed and manuscripts works, especially in libraries and archives. The majority of the doctoral dissertations in the U. S. are microfilmed. Some important institutions, such as national libraries all over the world, still produce microfilms.

About this matter, first of all, we need to understand microfilming as a process that involves political and technical decisions in every step. Beginning with the documents selection, this paper-based works have to be prepared for the mechanical aggression of the microfilming machine. The preparation also has to consider the sequential presentation of every photogram of the reel or the fiche. After the capture, the product of the microfilming must be developed in the laboratory, just like the traditional photograph. Then, the master reel generated by the direct capture of the document (in negative polarity) may be duplicated in a positive microfilm. This is only a summary of the technical stages of the process. For a wider perspective, we may consider microfilming as a socio-technical system, that implies the participation of a group of people technically prepared to develop the process, and consumers of the microfilming products, who can only access to their contents at prepared institutions that provide the proper reading devices.

We may propose that the necessity of microfilms is based on its historical use: after the selection and capture process, some people assume that the documentation may be destroyed<sup>1</sup>. Thus, the produced reel some times may be the only record left of that information. The document remains reduced in the particular material support of the film. In this article, we would like to present a tour of the different uses of microfilms, not only as preservation practice, but also as medium and ornament.

### **Libraries and banks: archival usage of microfilms**

The archival purposes of microfilming have been the outstanding aspect of the technique, but it started as a Victorian invention. After the emergence of the photographic process, John Benjamin Dancer combined the then new daguerreotype camera with the microscope lens, producing the first microphotographs in 1839. As early as 1853, some scientists were aware of the potential of this invention for scholars, such as the astronomer Sir John F. W. Herschel that imagined “the publication of

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<sup>1</sup> This was the main argument of Nicholson Baker to reject the application of microfilming. See Baker, Nicholson (2001) *Double fold: Libraries and the assault on paper*. Random House: New York.

concentrated microscopic editions of works of reference-maps, atlases, logarithmic tables, or the concentration for pocket use of private notes and manuscripts”<sup>2</sup>

But it is known that the microfilm was only a novelty, since the French René Prudence Dragon proposed a concrete use of the technique as a means of communication in the times of the Franco-Prussian war, as we will see later on.

Besides the philanthropic perspective of the archival usage for culture and science, the real engine of the medium was its commercial uses. In 1925, the banker George McCarthy developed and patented the “Check-O-Graph”, a micrographic camera with the purpose of resolving the problems the bank had to store their enormous amount of paper. The application of the technique to keep a legal and perdurable copy of commercial transactions activated its industrial production. Only after this invention, Eastman Kodak Company considered the fabrication of these machines (and the goods involve in microfilming). In 1928, Kodak bought the patent to McCarthy and established the Recordak Division, which produced microfilming equipment and supplies for sale.

So, the preservation perspective of this technique, both for public and private documents, is based in the change of the medium to keep information -from the fragile paper to the more durable film. The advantages of the microform, extensively treated by archivists and librarians, are based mainly in the reduction of the storage space, the possibility of having several documents in the same film and the transportation of these documents in microfilm, sometimes across countries or continents.

This last topic was relevant to conceive micro-reproduction as the technique that marks a precedent to the idea of global knowledge connected through an information network. We can trace some milestones of this perspective throughout the 20<sup>th</sup> century. At the beginning of the century, the Belgian Paul Otlet proposed the instauration of what he called *Mundaneum*, a universal bibliographical system that collected, registered and classified all the knowledge in the world. This initiative meant also the implementation of the Universal Decimal Classification, developed by Otlet and Henri La Fontaine. As W. Boy Rayward express,

Otlet believed that microfilm could be used to bring within reach of every scholar vast quantities of information either in the form of copies of existing catalogues and libraries of books, music, images etc or in the form of reconstituted information comprising a new approach to the Encyclopedia - what he was to call the Encyclopedia Microphotica Mundaneum<sup>3</sup>

The engineer Robert Goldsmith was a close collaborator of Otlet. In coincidence with Otlet’s proposal, Goldsmith researched into *le livre microphotographique*<sup>4</sup> as a new way to consider the publishing of bibliographic resources.

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<sup>2</sup> HERSCHEL, J. F. W. (1853). *New photographic process*. Athenaeum, no. 1341, p. 831.

Cited in Günther, Alfred (1962) *Microphotography in the library*. UNESCO: Paris.

<sup>3</sup> Rayward, W.B. (Trans and Ed.) (1990). *The international organization and dissemination of knowledge: Selected essays of Paul Otlet*. Amsterdam: Elsevier.

<sup>4</sup> Otlet, Paul; Goldschmidt, Robert (1906) *Sur une forme nouvelle du livre: Le Livre microphotographique*. Publication No. 81; Bruxelles: Institut International de Bibliographic.

Between the two World Wars, the World Congress of Universal Documentation was held in Paris in 1937. This meeting enabled the spread of the microfilm technique into the field of libraries and archives. Not only there were several pieces of equipment on exhibition, such cameras, developing machines and reading devices, but also the Congress itself resolved the implementation of the microfilm as a walkthrough for the access of information in libraries<sup>5</sup>. In this context, the writer George H. Wells presented the inspiration of a World brain<sup>6</sup>, the utopian idea of the organization of linked knowledge through the access to all written knowledge. He was talking about microfilms, too<sup>7</sup>.

As a third act of this play, after the Second World War, Vannevar Bush published his fundamental article "As we may think"<sup>8</sup>, in which he promoted the growth of human knowledge and of the access to connected documents by using an imaginary device called memex. "A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory."<sup>9</sup>. Now, again, microfilm was the chosen support of the information that the memex stored.

What these intellectuals were thinking about was the virtual access to all information in the world; certain though imaginary antecedents to the World Wide Web as information network.

This "first wave" of information technology based on the microform<sup>10</sup> as media to provide access to the entire intellectual and cultural production in the world (and in human history) was combined with a large project to microfilm documents. For example, the initiatives made by the Library of Congress for filming British manuscripts in the 1930s. In 2009, when the Historical Archive of the City of Cologne collapsed, many of the destroyed documents were recovered from the microfilms produced after the Second World War.

In spite of these theoretical (or even practical) advances, we have to mention that this was actually the last usage in the history of microimaging, as we will see in the following section.

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<sup>5</sup> Davis, Watson (1937). "Microfilm regarded as key to "world brain" creation", in *Berkeley Daily Gazette*. September 24<sup>th</sup>, p. 19. Retrieved from Google News, <<https://news.google.com/newspapers?id=2Y4kAAAAIBAJ&sjid=1KMFAAAAIBAJ&hl=es&pg=1120%2C2165878>>

<sup>6</sup> Wells, H.G. (1938). *World Brain*. e-Book. Retrieved from Project Gutenberg of Australia, <<http://gutenberg.net.au/ebooks13/1303731h.html>>

<sup>7</sup> In the same Congress, Emanuel Goldberg presented his Statistical Machine (patented in 1931), an Electronic retrieval machine for microfilms that may be an inspiration to the Bush's memex.

<sup>8</sup> Bush, Vannevar (1945). "As we may think," *Atlantic Monthly* 176 (July 1945) pp. 101-108. Retrieved from The Atlantic, <<http://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/>>

<sup>9</sup> *Idem*.

<sup>10</sup> Case, Donald O. (2009) "Waves of Information Technology", in *A ciência da informação criadora de conhecimento*. Vol. 1. Borges, Maria Manuel; Sanz Casado (coord). Coimbra: Universidade de Coimbra. Retrieved from Estudo Geral - Repositório Digital da Universidade de Coimbra, <[https://estudogeral.sib.uc.pt/bitstream/10316/29968/1/actas\\_EDIBCIC2009\\_1.pdf](https://estudogeral.sib.uc.pt/bitstream/10316/29968/1/actas_EDIBCIC2009_1.pdf)>

## Espionage and governments: cryptographic usage of microfilms

Besides the archival use of the microforms, the reduction and the migration of the documentation support appeals to hide and keep the secrecy of the content, hindering its readability. Although there is no necessary encoding of the information, the access to the content of a microimage is restricted to those who ignore the technique. We can notice an appropriation of microfilming by espionage, and beyond that, an elaboration of the matter by the cultural representations of spies. The reduction of the documentation, the easiness of the transportation of the products and the fidelity to the original document are clearly desired characteristics for the theft of reserved information. Several spies' stories, fictional or based on true facts, mention the use of microfilm as a fundamental practice. We can mention, in one side, the "Pumpkin Papers", some microfilmed secret documents of U. S. State Department that were used as evidence in Alger Hiss trial, an American government official accused by the House Un-American Activities Committee. Or, in the other one, the MacGuffin of the film *North by Northwest* (A. Hitchcock, 1959): a pre-Columbian idol that hides a microfilm in its belly.

We believe that the antecedent to this practice, as we mentioned before, was the first public and practical use for microfilms: the Pigeon Post. In the Franco-Prussian War, during the siege of Paris (1870-1871), René Dragon implemented this postal system that employed carrier pigeons to transport microfilmed documents. The communication system worked between Paris and Tours, where the microfilmed messages were produced. When the pigeons arrived in the city under siege, breaking through the Prussian lines, the microimages were amplified by the same physical principle of the magic lanterns. After the war, Dragon published a 24-page pamphlet<sup>11</sup> in which he narrated (and deemed "heroic") the two balloon flights<sup>12</sup> he made with his collaborators to bring out of Paris the necessary equipment to establish and a postal service of microphotography and its implementation. The deliveries of this system were both official and private mail, i.e. they had the support of the government.

In this same path, but by other government and in another war, a similar system was put in action: the V-mail, or Victoria Mail. During the Second World War, the U. S. developed this hybrid postal system, in which the mail was sent on microform, and then distributed printed in photographic paper. The V-mail is based on the British Airgraph, established in the United Kingdom with the participation of the Eastman Kodak Company. The only technical aspects of microfilming that operated in this "patriotic" initiative were the reduction of the space (of the personal letters) needed in a cargo plane and the possibility of easy transportation of the microfilms, with the final objective of reducing shipping costs.

Many governments apply the technique also to reduce the storage space of national documentation. A first look to this practice may elicit a positive reaction, based on the archival usage of the microfilm. But a deeper look may reveal the ideology of the document selection and the legal terms of the process. Microfilming is considered many

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<sup>11</sup> René Dagon, René (1870-1871). *La poste par pigeons voyageurs (...)*. [s.d], Tours-Bordeaux. Retrieved from Bibliothèque nationale de France, <<http://gallica.bnf.fr/ark:/12148/bpt6k1108455>>

<sup>12</sup> The balloons where called Daguerre (transporting Dragon and crew) and Niepce (transporting the equipment)

times as a “ ‘film-file-and-forget’ medium”<sup>13</sup>. As Auerbach and Gitelman<sup>14</sup> express, “[w]hether in paeans to its archive-handly reduction ratios or in plots discovered and imagined, this technology of miniaturization offered a material way of measuring and visualizing the tensions between active human agents and larger impersonal structures of state that organized, domesticated, and jeopardized them.”

The first initiatives on microfilming in Argentina came from the armed forces of the State. In addition, there have been several laws that promoted the microfilming of sensitive records, such as houses or cars propriety registers, patents submission, or even administration resolutions of no longer existing national institutions. In this sense, we have to recognize that microfilms play an important role, for example, in the search for justice for the victims of the last dictatorship in our country. Almost by chance, hidden behind a wall, several microfilms were found. These reels were produced by the Federal Police and presented the files of persons who died between 1970 and 1985. Now, they are taken as evidence in the trials against former members of the military junta. The digitisation of these microfilms is helping to identify persons that were registered as NN by the Police, and were reported as *desaparecidos*.

### **Pendants and trinkets: ornamental usage of microfilms**

Finally, we would like to consider other uses of the technique. Ironically, this was the first commercial usage that the microphotography had. Since the 19th century, the microfilming was used for what was then called optical bijoux or Stanhopes, little common objects with microphotographies (and amplifier lens) mounted on them. René Dragon presented *his bijoux photographiques microscopiques* in the French section of the International Exposition in London (1862), delighting the visitors. These novelties spread widely among the Victorian society, being one of the particular supports for the constitution of its visual culture. The miniaturized images, together with other reproduction systems of the time, represented royal and civil portraits, landscapes and travel destinations, quotes or art works. The same as photography, one of the earliest uses of the microimages were the erotic themes. As the microphotographs were inserted in common use objects, such as chain watches, rings or pens, it was easy to see nudities without being noticed. This peep images were hidden for private consumption, in which the users appeared to look through a keyhole.

An interesting angle of the microreproduction in jewelry is the religious perspective. The microfilms could be used to wear, for example, the Lord's Prayer in crosses. The Stanhopes allow taking the sacred images in pendants or in other personal accessories. We can find another version of this practice in the contemporary Jewish tradition, where we can also find pendants in the shape of David's stars, with microfilms of the Book of Psalms in them, like a mezuzah (cylindrical parchment with quotes from the Torah). It is believed that this jewel brings protection to its bearer.

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<sup>13</sup> Amundson, W. M. "Law office memos. From carrier pigeons to law books", in *American Bar Association Journal* vol. 59 (September, 1973)

<sup>14</sup> Auerbach, J. & Gitelman, L. (2007). Microfilm, Containment, and the Cold War. *American Literary History* 19(3), 745-768. Oxford University Press. Retrieved from *Project MUSE database*, <<http://muse.jhu.edu/journals/alh/summary/v019/19.3auerbach.html>>

The Buddhist tradition presents this uncommon use as well. The Buddhist Microfilm Initiative promoted the uses of the technique to reproduce millions of mantras in a single reel. This microfilm may be donated as offerings to settle a Stupa, a consecrated structure that contains relics in its base. According to Buddhism, the presence of the sacred text in the foundation of the Stupa accumulates merits. The microfilm enables the presence of thousand mantras in a reel, providing benefits to all beings.

This contemporary usage of microforms focuses on the content of the film. The other face of the coin is presented by modern crafts that reuse the microfilm as material for accessories. These Etsy.com products on sale (pendants, earrings, bracelets) are handmade and they use microfilm as raw material. Some of them were promoted as “a perfect gift to a librarian”. The comments of the posts written by buyers affirm the originality and uniqueness of the goods. We can also find some DIY crafts that use microform, which applies the material support of microfilming to hack Ikea products.

These uses of the microfilm, linked with the ornament or the religion, show a wider horizon for the technique. Whether it becomes a novelty or a cult item, microfilming provides an uncommon base for this objects that exist and circulate far from the libraries.

## **Final words**

After all, we can notice that the different uses of microfilming were settled in the 19th century and have continued to these days. Our point is that we face discursive and imaginary constructions of a reproduction technique, which was elaborated through historical and cultural aspects, based on the use of the products –in this case, microfilms.

The libraries and banks aim to preserve and access the information. Espionage and governments want to keep and control it. The ornaments show the materiality and the religions merge their traditional believes with the technique.

As Anna Perraul proposed, “[t]his universe of microform materials represents an historical commitment.” The mere existence of microform demands our attention on why (and by whom) it was produced, which is its usage, who uses it, how it is used and circulated, and so on. The study of the technique, both as material culture or intellectual history, let us reinterpret this persistent media that refuses to become obsolete.

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