

Andra's Memory Program - Linguistics and Semiology – 15587

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ABSTRACT

In the framework of its Memory Program, Andra has launched various studies related to semiotics, for the medium and long term.

Part of this work, dealing with linguistics and semiotics, is performed at the Centre de Recherches Sémiotiques (CeReS) of the University of Limoges. Preliminary results highlight the fact that language durability may be reasonably considered for the medium term, but cannot be expected beyond a few thousands of years, and that languages cannot guarantee message appropriation. The role of Man and of the disposal site itself in message transmission is emphasized. In this context, art may play an important role in this transmission, by transmitting the meaning without necessarily using language.

By the way, Andra has been exploring for several years the role of art for memory transmission, by supporting the work of artists interested in this field.

In future research, Andra will promote more cross fertilization of artistic and academic reflections.

INTRODUCTION

Among its duties in management of radioactive waste, Andra, the French National Radioactive Waste Management Agency, has to set provisions for the preservation of memory of its radioactive waste repositories after their closure. Andra has therefore developed a reference solution, based on what is being implemented for the surface Manche repository (CSM). CSM, the first radioactive waste repository operated in France, is now closed; it entered in the surveillance phase in 2003. For deep geological disposal, in coherence with the objectives set in the ICRP publication 122, Andra has decided to set a target of keeping the memory of the disposal facility for as long as possible. Considering that the reference solution is valid only for several centuries, in 2010 Andra launched a research program, called "Memory Program", with a dual purpose: to enhance the robustness and the defense-in-depth of the current reference solution for existing facilities, and to develop various points of view and studies on memory preservation over several millennia.

Part of this program involves dealing with academic studies in linguistics and semiology performed by researchers of the Centre de Recherches Sémiotiques (CeReS). Another aspect of the Memory Program is oriented towards the role of art, belonging also to the realm of semiotics. Another action point of the Memory Program is Andra's participation in the international project coordinated by the Nuclear Energy Agency (NEA) of OECD in this field, the Records, Knowledge & Memory (RK&M) preservation project. In September 2014 Andra hosted the "Constructing Memory" conference and debate organized by NEA in Verdun (France). This conference occurred at the beginning of phase II of the RK&M project; its objectives were to share the results of phase I of the project (2010-2014), and to collect ideas and suggestions for phase II (2014-2017). It provided fruitful discussions between people from various fields: implementers, regulators, stakeholders, scientific researchers, archivists and artists.

During phase I, the RK&M project identified three main timescales for RK&M preservation, defined in a glossary: short term refers to the period before repository closure; medium term corresponds to the period of indirect oversight, as defined by ICRP-122; and long term, when the possibility must be considered that indirect oversight is no longer maintained. The long term timescale typically refers to beyond one thousand years.

The main issue addressed in this paper is the following: how can we enforce the transmission of a message, and its appropriation, over the long term (according to RK&M glossary).

DESCRIPTION

The Academic Studies

The method adopted by the CeReS in the first phase of the research has combined a wide spectrum bibliography and focused studies. The aim of the bibliography study is, as usual for a research project, to identify the available work, but also any unexplored fields. The first results highlight the lack of references referring to long-term communication: only avenues for reflection are outlined (Cf. Seobok's studies [2][3]). The two focused studies have been conducted along two lines: on "durability/longevity" (of media and languages), and secondly on "mediatizing/mediatization", i.e. accessibility, sharing, exploitation of the message. Another associated study deals with sound perception, with a view to exploring robust sounds.

The durability/longevity study shows that neither a language, nor several languages, nor images (pictograms) or even a material specific to a support media (e.g. a sapphire disk) are a guarantee of longevity of a message. It is better to rely on a set of devices, forming a meaningful whole, to be transmitted by tradition routes. The mediatizing/mediatization study shows that not only they cannot guarantee transmission, but they cannot guarantee appropriation either.

From these studies, avenues for the next phases of the research have been identified:

- a methodological "profile" has been created for semiologic studies associated with Andra's Memory Program
- as long term memory is studied in this research in terms of communication, specifications for the long-term communication system are drafted, characteristics to be prescribed and to be proscribed are identified;
- the disposal site itself would be at the core of the communication system. It would "enunciate" and "communicate" a discourse, according to tradition ways, therefore live and be associated with Man
- the communication system would support a "collective" memory of radioactive waste

The Role of Art

Art has been considered, at the various timescales defined by the RK&M project, as a means to foster memory preservation related to radioactive waste repositories.

For example, regarding the medium and long term timescales, in the end of the 20th century in the US, the painting "The Scream" by Munch, because it shows a terrified face in a stylized manner, was considered for the design of markers for the WIPP. Proposals have also been made, for example by the architect Michael Brill, to build markers that suggest the harmful power of the site through their shape (spikes).

The "Constructing Memory Conference" offered the opportunity to see how art may contribute to memory preservation, at the various timescales. [1]

For example, the design of the Habog high level waste storage facility in the Netherlands incorporated art as a means to create a kind of ritual, fostering memory preservation. In the artistic concept of the Habog facility, the theme of gaining value from decay was developed by

the artist William Verstraeten. Rituals are considered in the design of this facility, based on both on radioactive decay and on the sun's path.

Artists Thomson and Craighead propose a nuclear semiotic totem based on counters which would present the radioactive decay of the nuclear waste. [4]

In the UK, the Cumbrian alchemy exhibition presented by R. Williams and B. McGovern Wilson develops the notion of nuclear folklore, referring to T. Sebeok's proposal of an "Atomic Priesthood". [4] [5]

Since 1994 Cécile Massart has focused her artistic research on the identification of radioactive repositories in the landscape. At the Constructing Memory conference she presented her series of drawings called "The Laboratories", which sketch the process of memory building through the installation of artistic laboratories on the surface, during the filling of the underground facilities and after the closure of the site. [4]

In France, Andra has also been supporting the work of artists for several years, in order to explore the possible contribution of art to memory preservation. One of them is Cécile Massart, already mentioned. Veit Stratman, a visual artist who lives in France, has proposed, as a result of his artistic reflections, to introduce a ritual, once the Aube repository is filled: the ground could be periodically scraped near the facility, every 30 years (referring to every next generation), building a hill above the repository with the excavated material. Though he noted that he didn't think this was really feasible (and the engineers confirm that it would raise real technical issues!), this is worth mentioning as another illustration of possible rituals to foster memory preservation. Stratman also mentioned that he could only reflect on a scale of a few centuries, which corresponds to the medium term timescale according to RK&M project glossary, therefore addressing memory preservation for a surface repository only.

To complete this short survey of artistic research related to medium and long term communication, we should not forget the Pictograms, created by Yona Friedman as a scriptural language. [6]

DISCUSSION

In his film « Into Eternity », Michael Madsen underlines the paradox of memory and oblivion regarding a radioactive waste repository, which future generations should not disturb: « don't forget to forget! ».

The semiotic study in progress proposes to compensate this interdiction of digging into the repository by an authorization of communication systems, in order to foster long term appropriation of the repository marking system. As for the short and medium term, communicating over the long term requires referring to the system of values that Man associates with the radioactive waste. This suggests that the information about the repository should be part of a communication system at the repository. Beyond the current value of radio-active waste and beyond its value in the future (according to social contexts that may evolve extremely quickly, or may not), what seems the most suitable (and therefore the most reasonable) for relaying memory is a communication system that promotes connectivity between Man and repository. In order to allow this system to settle and extend over generations, it should be built as a model system: timeless and without context, so that future generations can transform it and take possession of it.

CONCLUSIONS

Initial studies on strategies and processes for transmitting information since antiquity carried out for Andra by "Université de Limoges" in France show that:

- The phantasm of a universal language (with its implication of fixing, transmitting and receiving information through a perfect language) that has haunted the West since the death of Latin does not exist.
- The future cannot be anticipated in the same way as the past is perceived, since knowledge of the past evolves with space and time.
- Transposing language through writing alone is insufficient for comprehensive information, which must be supplemented with a graphic element. Possibilities offered by other means of communication, such as sounds, might also be investigated. The effectiveness of the message, its performative and prescriptive force, will depend on its context (place, medium and content).

It is thus necessary to extend linguistics to all possibilities available in semiology, for example:

- Use an intermediary medium, communicate about nuclear waste using dedicated marking, which is the initial element constituting a semiotic situation.
- Convey a warning, a means of risk prevention, while at the same time maintaining neutrality with regard to moral responsibility for the marking or disposal facility and trying to avoid diverting intentional interference with the disposal facility to an interaction with the marking.
- Design a communication system based on man's appropriation of marking, by compensating for the prohibition to enter the disposal facility by an authorization to participate in the communication system of marking.
- Develop a symbolic marking system using art or any other form of conceptualization that does not suppose prior knowledge of radioactivity, by associating the repository design with the semiotic system of communication.

For the following research, noting the convergence of artistic and academic reflections, Andra will encourage more cross fertilization of artistic and academic realms.

REFERENCES

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- [2] T. Sebeok, "Communication Measures to Bridge Ten Millennia", Columbus, OH: Office for Nuclear Waste Isolation, 1984
- [3] T. Sebeok, "Reducing the Likelihood of Future Human Activities That Could Affect Geologic High-level Waste Repositories by The Human Interference Task Force".
- [4] Ele Carpenter, "Constructing Memory Conference", Nuclear Culture, <http://nuclear.artscatalyst.org/content/constructing-memory-conference-0>
- [5] Robert Williams & Bryan McGovern Wilson (eds.). Cumbrian Alchemy. Unipress Cumbria. 2013
- [6] Yona Friedman, "Manuels" Vol 3, CNEAI (2008)