ARCHIVAL METAHISTORY AND INHUMAN MEMORY

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The following text investigates if the relation between terms like "Artic memory" to the institutional archive and especially technological storage is more than just a metaphorical one. Within a society increasingly dominated by storage practices, cultural memory itself "cools" down. The very definition of "information" itself is closely linked to mathematics which has been developed in physical thermodynamics. Therefore the current interest in the "Arctic discourse" turns out to be a symptom of current media culture itself.

"Archives" of the Arctic and the metaphorical risk

There are geological times and clima changes on the one side and cold technological storage on the other. Both temporalities have one common denominator: They challenge what is familiar in cultural knowledge as "historical time".

The attractive figurative surface of the conference topic *Archives of the Arctic. Ice, Entropy and Memory* immediately triggers academic, cultural and artistic imagination. But behind there lurks a challenge on the epistemic ground level: Is it possible to keep a reasonable balance between the discursive effects induced by the Artic ice as metaphor for cold memory and a precise discussion of terms like archive, memory, (neg-)entropy and storage, or is it rather advisable to keep both ways of analysis strictly distinct?

Ice is a frequently used metaphor for the archive indeed, both popular and artistic as well as in the scientific imagination. But in terms of archival science, there could be no natural archives since the criterium of purposeful selection is lacking. Geological and thermodynamic time dramatically differ from symbolically organized time which is, according to Gianbattista Vico's and Ernst Cassirer's definition, cultural time known as history.

How to resist extending the term "archive" to all kinds of metaphorical denomination of memory forms? The archive is a symbolical, cultural, thus (in Vilém Flusser's terminology) a "negentropic" form of memory organization, different from physical "recording".

A tactical answer to the metaphorical challenge is to take the ancient Greek sense of *metaphorein* in its media-archaeological sense: long-time *transmission* by ice memory. The Artic ice is literally "metaphorical" in that it carries frozen states into a different time. But different from cultural "tradition", this transmission is non-intentional.

A physical "memory" of energetic processes ("Materialgedächtnis") is not an archive since it is not inscribed into and by the symbolical regime.

The memory of the past, metaphorically "frozen" in archival records, traditionally used to be de-freezed by historians turning this *cool* classified memory into *hot* historical imagination expressed in historiographical stories.[1]

Today, the traditional extremes of long-time storage (or even memory for eternity) for which the artic ice serves as a metaphor on the one hand, and short-time "hot" memory (within the perceptual "window of presence" within the human brain and in computing CPUs) for which electricity serves as an index in McLuhan's media theory, merge into one: "The economy of temporal (re-)call becomes time-critical itself. *Streaming media* and storage become increasingly intertwined.[2]"

Storage is just a slowed-down event - like the "freeze frame" in cinematography[3]. Archival stillness and processual media

1 See Marshall McLuhan's notorious distinction of "cold" media which demand active participation and interpolation by human senses as opposed to high-definition information which "heats" only one of the human senses: Marshall McLuhan, Understanding Media, New York (McGraw Hill) 1964, chapter 2
2 See Wendy Hui Kyong Chun, Programmed vision. Software and Memory, Cambridge, Mass. / London (MIT Press) 2011
3 See Stefanie Diekmann / Winfried Gerling, Freeze Frames. Zum Verhältnis von von Fotografie und Film, Bielefeld (transcript) 2010. See as well Gusztáv Hámos / Katja Pratschke / Thomas Tode

time are interlaced.[4]

"Arctic Discourses": De-freezing the archive and delayed transfer

The climat change as induced by the industrial warming of the earth, resulting in melting (ant)arctic ice, serves as a macro-physical analogy to the heating up of communication in Internet realtime, time-flow, water instead of ice, short-term intermediary memories instead of the eternal archive.

Let us climb Alpine mountains in early springtime. While the sun already starts to warm the wanderer, snow and ice on the ground still resists. It takes until actual summer to see this finally melt away. Eveidently ice is less a metaphor for eternal memory than for delay: rather an equivalent to the electric condenser than to the archive. The time-critical counterpart of the archival long-time preservation memory is condensed time in frozen ice indeed. With frozen water, instead of archival endurance, we confront what Wendy Chun in terms of dynamic computer memories calls "the enduring ephemeral"[5].

Delayed energy storage, in Norway, are artificial lakes on top of the mountains, with their water flow to be released in times of energy shortage; the Dt itself is the symbolical notation (and shape) of an ice-berg. "Delay", as well known from early computer "memories", names the variable, scalable temporal interval replacing the ontological notions of emphatic eternal memory.[6]

Rocky fields: on "metahistory"

(eds.), Viva Fotofilm. bewegt/unbewegt, Marburg (Schüren) 2010

4 See David Green / Joanna Lowry (eds.), Stillness and Time. Photography and the Moving Image, Manchester (Cornerhouse) 2006

5 Wendy Chun, The Enduring Ephemeral, or The Future Is a Memory, in: Erkki Huhtamo / Jussi Parikka (eds.), Media Archaeology. Approaches, Applications, and Implications, Berkeley / Los Angeles / London (University of California Press) 2011, 184-203

6 See T. Kite Sharpless, Mercury delay lines as a memory unit, in: Proceedings of a Symposium on Large-Scale Calculating Maschinery, Cambridge, Mass. (Harvard University Press) 1948, 103-109

If the Arctic ice does not represent an archive in its proper sense, does it rather embody a kind of involontary memory of "anonymous" history in terms of Siegfried Giedion?

Let me here introduce the term *metahistory* as the supra-time-critical transcendence of historical, man-made time. My use of the term archival "metahistory" differs from Hayden White's notorious definition of *Metahistory* (1973)[7] as the forms of rhetorical prefiguration in emplotments of past events which transform the tectonics the of archival storage into narrative.

I rather use the term "metahistory" in the sense of the historian of economics Friedrich von Gottl-Ottlilienfeld. In his lecture at the German Historians convention in Heidelberg 1903 on "The limits of history" (*Die Grenzen der Geschichte*) Gottl-Ottlilienfeld reserves the same term *Metahistorie* for temporalities in the natural sciences as opposed to "historical" time in the humanities.[8] For illustration, Gottl-Ottlilienfeld describes geological formations in the Odenwald region of South-West Germany analog to the arctic formation. Two temporalities have been at work here, the macro-geological and the cultural-historical.

While the geological formations dissolved into a field of dissipated rocks (the "Felsenmeer" close to the city of Reichenbach) and represent macro-temporal physical entropy (the tendency to equally distributed disorder), the remains of ancient Roman carvings out of these rocks are traces of history, of neg-entropic, in-formative (Flusser) energy invested against the physical evolution ("historical" time).

To the present specator, though, the marco-dimensional and the historical time dimension aesthetially merge into one, since in many cases it is undecidable whether marks on or in the rocks have been results of physical decay or or ancient Roman carvings.

As opposed to bare material memory, how to decipher symbolically "encoded" past if the hermeutical cue ("code") is not known?

Sometimes it is difficult to separate naturally distributed rocks from a ruined human setting. The cognitively learned

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7 Hayden White, Metahistory. The Historical Imagination in Nineteenth-Century Europe, Baltimore / London (Johns Hopkins University Press) 1973

8 Reprinted in: Friedrich von Gottl-Ottlilienfeld, Wirtschaft als Leben. Eine Sammlung erkenntniskritischer Arbeiten, Jena (Gustav Fischer) 1925, 337-379 (420). I owe this reference to Ferdinand Fellmann.

macro-temporal dimension is affectively perceived as condensed time.

Conventional philosophy of history differentiates between geological and historical time as *epoché*. In the case of the field of rocks which at the same time served as stone quarry both temporalities suddenly appear undistinguishable.

Entropic time can not be grasped by historical imagination and is only symbolically accessible through Ludwig Boltzmann's formula which is engraved on this tomb stone at the Vienna Südfriedhof. Such a reading of thermodynamic entropy explicitely "compares with C. E. Shannon's discussion of telecommunication which can be examplified this way: information is being coded as a telegram which in transmission creates negentropy in the cable. When the electric pulses are received, information can be retrieved.[9]

This equals the formula for emphatic cultural tradition indeed: alphabetically coded information is sent by the institutional archive to be decoded by historians and transformed into narrative (historiography).

(Ant-)Arctic data clouds

Our conference focuses on the circumpolar area under an archivological perspective. Let us do so in terms of information theory. Any transformation of entropic states into information is negentropic. Roald Amundsen's cartographer during the first crossing of the Northwest-passage, Godfred Hansen, described the polar explorer's erected stone look-outs as "[...] his journey's traces against time's erosion, [...] when his name is gone as the melting snow."[10] Let us switch here from physical to informational negentropy. In its interactive virtual environment *Dialogue with the Knowbotic South* (1994)[11] the media art collective Knowbotic Research

9 See L. Brillouin, Maxwell's Demon Cannot Operate. Information and Entropy, in: Journal of Applied Physics, vol. 22, no. 3 / 1951, 334-337 (335). I owe this reference to Matthias Wannhoff, Media Studies, Humboldt University, Berlin

10 Godfred Hansen, Mod Kung Haakon VII's Land, in: Nordvestpassagen, Roald Amundsen, Kristiania (Aschehoug) 1907, 488, as quoted in: Hanna Eglinger, "Traces against Time's Erosion": The Polar Explorer between Documentation and Projection, in: Ryall et al. (eds.) 2010, 2-18 (8)

11 For a curated documentation see http://www.medienkunstnetz.de/werke/dialogue-with-the-knowbotic-south (accessed September 2013); for a video documentation see http://www.youtube.com/watch?v=dJ3ZbD5uGkE (accessed September 2013)

(KR+cF) devised a knowledge space to represent what we geographically call the Antarctis, a model of a Computer Aided Antarctica based upon the available computer-processed information on current antarctic research as it appears in public data networks. Apparently the Antarctic as informational space actually happens outside the Antarctis, as artificial nature in data representations of measuring and sensoring instruments covering this area and procuding, every second, a stream, a flood of data (like satellite vision or US NSA data surveillance within the PRISM program). These informations can be grasped and administrated only by articial intelligence (learning algorithms, so-called knowbots) in computer networks. These agents create objects out of the flood of information.[12] The data body of this Cyber-Antarktica as presented by Knowbotic Research is based on temperature data and Ozone values - scientific material which has lost any deep sense or semantic meaning, replacing the semiotic, cultural interpretation by the Wiener / Shannon definitions of information through communication channels. Data clouds here replace narrative - like Iannis Xenakis' stochastic musical compositions.

When the physicist makes an observation, he hyper-ecologically transforms negative entropy into information which nature never produced beforehand. Let us think in terms of thermodynamics which is the only non-metaphorical language (and mathematical symbolism) to link "Arctic memory" with the archive and with storage media.

Archival emergency and the cold archaeological gaze: *Quick freeze*

In media archives films rolls are frozen down in order to withstand time. The vocabulary of storage media is significantly dominated by the language of temperature indeed. In administrative and mass media terms, "quick freeeze" - a term taken from preservation of nutrition (*Schockfrosten*) is a preservation order, an administrative *Speicheranordnung* to prevent the almost immediate erasure of telecommuncation data in companies just in case there is need to de-freeze them for legal investigation - the suspended interval.

Thus the icy freeze is not just about long-time memory but a time-critical short-time-memory technology as well.

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12 For a report on the digital installation of *Dialogue with the Knowbotic South* in Kunstraum Wien see Arnd Wesemann, Datenschwärme aus der Antarktis, in: Frankfurter Rundschau, 2nd September 1995

In the United States there is a huge image archive permanently located in the Iron Mountain, Pennsylvania.[13] The Corbis Corporation there keeps the physical photographies and negatives of which it commercializes their digital distribution and rights. In the cold technical language *memory* is nothing but a metaphor for storage which is not about remembrance but simply a numerical function of logistical addresses. The archive is a mnemonic agency in a technological sense, while remembrance is a human (if not social) bias which drives record traces from beyond the archive.

In technical terms, "cold storage" means signal or data storage (such as Flash Memory) at the lowest possible expense of electric energy.[14] MO I RANA is the cold location of the memory-technological branch of the National Library of Norway in the far North - embedded within a mountain, cold storage here serves for audiovisual media storage as opposed to the culturally "hot" spot of the printed books library in the center of Oslo.

Practically speaking storing digital data carriers in ultra-low temperatures (be it a refrigerator or an iceberg) exponentially increases the probability for undamaged preservation; "arctic" digital memory.

But just like in the case of the Corbis image agency, which stores its photographic originals within a mine operated by the Iron Mountain/National Underground Storage company, the resistance to climactic change, earthquakes and other physical or man-made accidents is paid for by unaccessability. Physical memory becomes literally remote. For research, the user is directed to the Corbis *digital* archive; instead of analogue photographies from the past, the researcher is presented with their information. „Analog is having a burial and digital is dancing on its grave."[15] And Arthur Kroker adds: "Now, we are suddenly living in the culture of the retrieval of digitally archived images by remote control: images safely kept at a distance from human contact, uncontaminated by the passage of time. The image archive is reduced to the steady flicker of the cybernetic code" which is in fact no more iconic but a series of alphanumeric characters (as presented in the control room in the Wachowsky brothers movie *The Matririx*).

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13 See Jorinde Seijdel, Cold Storage, in: Open 2004, no. 7 "(No)Memory", 66-77

14 See Cade Metz, Facebook Wants New Breed of Flash Memory for Storing Old Pics, in: Wired (June 17, 2013); *online* www.wired.com/wiredenterprise/2013/01/facebook-cold-storage (accessed September 2013); this information comes from Johannes Maibaum

15 Commentary by Sarah Boxer in the New York Times, April 15, 2001

Frozen sound

It is the technomathematical condition of our media culture which triggers our metaphorical interest immediately once the Arctic subject is named - "cold" in terms of hardware and of mathematics which requires a research method as anticipated by Friedrich Nietzsche's passion of distance ("Pathos der Distanz").[16]

The "frozen" corresponds with the techno-mathematical approach such as the electronic synthesis of the human voice. Among others with parallel approaches, Boris Yankovsky in Moscow in the 1930s developed a method of computing the human voice which treats the sound matter in a fully formal approach: a combination of a mathematical model of the synthetic tone ("syntone") and its implementation in a processing mechanism (Yankovsky's Vibroexponator). "To synthesize the human voice singing a vowel, one would need to choose several templates related to formants [...], to add extra templates as needed [...], to recalculate their sizes according to the desirable frequencies and intensities of formants, and then to mix them. The final waveform would sound like a 'frozen' vowel", as described by Andrei Smirnov.[17] "Frozen" - aha. But caution, soon we are trapped by the metaphorical risk again.

"The phonograph as media artifact not only carries cultural meanings like words and music but is at the same time an archive of cultural engineering by its very material fabrication - a kind of frozen media knowledge that - in a media archaeological sense - is waiting to be unfrozen, liquefied.

Digital archaeology operates both below and beyond the sensual or even cognitive thresholds of sight and sound - a level that is not directly accessible to human senses because of its sheer electronic and calculating speed. Synesthetically, we might see a spectro-graphic image of a tiny section of previously recorded sound memory - a straight look into the real media archive. The microphysical close reading of sound, where the materiality of the recording medium itself becomes poetical, dissolves any semantically meaningful archival unit into discrete blocks of micro-sound. Instead of applying musicological hermeneutics, the media archaeologist suppresses the passion to hallucinate "life" when he listens to recorded voices.

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16 As expressed in Friedrich Nietzsche, Jenseits von Gut und Böse, Leipzig (Naumann) 1886, § 257, 227

17 Andrey Smirnov, Sound in Z. Experiments in Sound and Electronic Music in early 20th Century Russia, London (Koenig Books) 2013, 215

"The idea of 'cool' and now 'frozen' actually becomes a figure for the way in which media as time machines 'package' sense data in order to endure time. It plays with the idea of the traditional task of heritage, storage, and preservation of freezing time and dynamics of life"[18] in terms of technical media.

Ice-cold video memory (Nomi)

Phonographically recorded signal memory defreezes once it is being re-played by an appropriate record player.

One step further is the technological de-freezing of electromagnetic latency, that is audio and video recordings on magnetic tape. In Henry Purcell's opera *King Arthur* the de-freezing of the "Cold Genius" figures prominently with its repeated *staccato* outcry "Let me freeze again to death.". This drama has been re-encacted by the singer Klaus Nomi.

While the melting of ice is part of physical entropy, the video recording of Nomi's performance shortly before his death caused by the AIDS virus is a suspense of decay as media archive, a technical neg-entropy as long as the tape can be actually re-played.

According to Norbert Wiener, "the time in which we live has an obvious direction and cannot be reversed without the production of effects which are more than paradoxical"[19] - like the video-recording of Nomi's *Cold Song*. Such a recording preserves an icy memory of the Nomi song. The *staccato*-like articulation "Let - me - freeze - again - to death" is the semantic message of the recording technology itself. The tentative de-freezing of Winter ice here takes place step-wise (frame by frame) like the stop-motion essence of chrono-photography and cinematography itself does to any recorded life movement. Nomi looks very much alive with his eye movements, but what we are looking at an iceberg of electro-magnetic signals. The older the analog tape gets, the more it entropically dissolves into equally distributed dots on the video monitor. De-freezing death is still unedead here.[20]

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18 Jussi Parikka, Archival Media Theory: An Introduction to Wolfgang Ernst's Media Archaeology, in: W. E., Digital Memory and the Archive, edited by Jussi Parikka, Minneapolis / London (Univ. of Minnesota Press) 2013, 1-21 (12)
19 Norbert Wiener, Time, Communication, and the Nervous System, in: Annals of the New York Academy of Sciences, Bd. 50, 1948/50, 197-219 (198)
20 See http://www.youtube.com/watch?v=wQrqgSK8-XU (accessed September 2013)

Recently, a Japanese artist extended the defreezing to the storage medium itself, by creating phonographic audio recordings not on vinyl, but on ice. The sound literally melts away, returning to its originary fugitive tempor(e)ality.

Freezing Streaming Media

Digital media culture itself de-metaphorizes expressions like "cold memory". The hotter data trading in the WWW and the "social web" takes place (Derrida's "archival fever" very literally, since all algorithmic data processing requires at least minimal moments of intermediary number storage) the more it needs technical cooling:

An example is the economical transition of the North-Swedish town Lülleor from previous steel industry to Information Technology; the Face Book provider installs a server farm for cloud computing. Here, the shift of emphasis from materiality and energy to information is not only true in Norbert Wiener's sense, but economically as well. The data in Face Book are being "mirrored" two to three times, for security reasons (which is creating data redundancy). What is it that makes icy conditions attractive for the digital "ice" age? The energy and water supply for such a data center equals the previous industrial steel factories; on a global level, two percent of energy consumption is actually due to computing.

Arctic conditions for signal and data storage

One basic argument of my talk has been to demonstrate the closeness of the "cold" Arctic memory metaphor to non-metaphorical storage technologies, that it takes the language and knowledge of thermodynamics and its derivative information theory to analysze this alliance and that the media-archaeological gaze it the appropriate method to cope with that constellation.

In terms of archives of the moving image, it takes hours to dehydrate stored film material. Here, the archive is not a metaphor for icy memory, but the Arctic becomes a denominator for "cold" media memory itself. In fact, freezing slows down entropic degradation. Information is not completely independent of temperature when it comes to digital storage; for the storage of 1 Bit a minimal energy is necessary. In a refrigerator at around 10 degree Celsius the data endurance of a typical flash memory (like a USB stick) is secure for

thousands of years.[21] Does the NSA, for example, thus demand artificial Artic glaciers to secure their data avalanche created by spying programs like PRISM? But in millenia ahead, the heating of the refigerator will have increased the earth's negentropy to a deathening degree - Maxwell's demon maximized to the "max". But in millenia, no being will be able to decipher a frozen electrostatic storage unit as a symbolical bit. In order to teach the reading code to future non-humans, a media archaeologist will first have to be frozen into Artic ice as well - maybe the author of this text.

21 As optimistically articulated in: Chip no. 5 (2012), 128