RADICAL MEDIA ARCHAEOLOGY (its epistemology, aesthetics and case studies)

[Extended version of lecture at seminar *Media Archaeologies Evening* at La Virreina culture institute (Barcelona), initiated by research group Art Matters on Arts, Design and Media (Vanina Hofman), Faculty of Arts & Humanities, Open University of Catalonia, December 1st]

I THE MEDIA ARCHAEOLOGICAL IMPULSE
Radical media archaeology against the soft archaeological metaphor
Computer archaeology: case *E. T.*
[Media archaeology as artistic research: "Dead Media"]
[Media materialism and Circuit bending]

II VIDEO ARCHAEOLOGY
Media themselves as archaeologists: archaic video recording
[Correcting the time base: non-human video tempor(e)alities]
Applied media archaeology: video art preservation

I THE MEDIA ARCHAEOLOGICAL IMPULSE

Media Archaeology is both a method and an aesthetics of approaching technical objects. With reference to Foucault's *archéologie*[1] and with its emphasis on the nonhuman, media-active archaeology, radical media archaeology differs from the soft archaeological metaphor. One characteristic of Media Archaeology is its focus on technological materialism, analytically or creatively bound to practices like circuit bending, while a more rigorous challenge is the techno-mathematical investigation of code and algorithms as the essence of computing. Computing is rooted in technical hardware, signal processing by electric fluidity and swichting gates, that is: the media *archive* in Foucault's sense (who uses this word in French in the singular mode, not to be confused with the classical state archive which in French is *plurale tantum*, notably *archives*). Not simply a structural law, advanced technologies is dynamic, which makes all the difference between an algorithm as a symbolical mathematical notation (traditional archival record) and its implementation as running program. In computational devices, there is not simply a duality between the user interface and its deep hidden ground, but rather a Moebius-loop-like dynamical interrelation resulting from the very definition of its von-Neumann-architecture and corresponding human-machine interactivity.

To counterbalance speculative events like the excavation of once buried computer game cartridges (case *E. T.*), a more code-oriented, critical resistance to the archaeological metaphor becomes obligatory. The topic of video games, for a moment, induces a short media-archaeological *intermezzo* on film. The increasing neglect of "cinema" as topic in media archaeology (Thomas Elsaesser's diagnosis[2]) depends on the understanding of its key term. *Radical* media-archaeology is fascinated with "cinema" in terms of its mechanism,

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1 See Michel Foucault, The Archaeology of Knowledge, transl. by A. M. Sheridan Smith, N. Y. 1976, 7, 106-117, 138-139
2 Thomas Elsaesser, *Film History as Media Archaeology: Tracking Digital Cinema*, Amsterdam (Amsterdam University Press) 2016

which is cinematography in its chrono-photographic essence (returning within cinema as the genre of "Photofilm"). Its appeal is not primarily "cinema" as movie theatre event or as art form, but the epistemic momentum which arises from close technical and philosophical analysis of what happens *within* the cinematographic apparatus itself: its automatism and *automathesis*. (implicit knowledge). A radical media archaeological re-interpreation of cinematography is its time-discrete essence as implicit anticipation of the digital image. Chrono-photography and the "moving" photographic image have stilled time and return within the Turing machine, where its operational tape for reading and writing characters is the digital equivalent of the "moving still". The photographic step-wise film frame recording has already prefigured what is contemporary "sampling" of analog signals into digital data, while the framed image itself, in current computing, not only implodes into the pixels of the digital image like micro-frames, but even disappears into algorithmic moving image compression. Digital film, therefore, is both the apothesis and the *posthistoire* of the cinematograpic mechanism.

When bracketed by mechanically discrete cinematography and the computationally discrete digital image, inbetween there has been the epoque of the "analog" electronic image. Recently, algorithms themselves have become the media-active archaeologists of archaic video recordings, and for the challenge of media cultural heritage, digital video art preservation becomes a case study in applied media archaeology.

Friedrich Kittler once coined the term "historical media archaeology"[3], while in terms of Radical Media Archaeology, history and media archaeology are incommensurable. The media-archaeological method is rather about "re-presencing" (Vivian Sobchack) than historicizing "past" media technologies. Media Archaeology as method of techno-logical research stays close to the signal (be it analog waveforms or digital pulses).

Media Archaeology as artistic research such as the "Dead Media" project, in spite of its merits in reminding contemporary technologies of its past alternatives, requires a media-epistemological counter-reading. Diagrammatic media archaeography experiments with alternatives to culturally familiar narratives of media historiography. Therefore Media Archaeography as mode of its description is proposed. Technical "miniatures" are the core modules of media-archaeographical writing, a way of close reading or thick description of technical details as new kind of "historical" source. Nick Montfort's webseite Trope Tank, since 2012, assembles such a „Series of Technical Reports“.

Radical Media Archaeology against the soft archaeological metaphor

For media archaeological analysis, the notion of archaeological or even geological "layers" (stratigraphy) is metaphorical and misleading; with integrated circuits and logical arrays, and with the miniaturization of

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3 In his academic review of habilitation thesis W. E., Im Namen von Geschichte. Sammeln - Speichern - (Er)Zählen. Infrastrukturelle Konfigurationen des deutschen Gedächtnisses, submitted to Philosophical Faculty III at Humboldt University, Berlin (2002), published Munich (Fink) 2003

electronics into flat "smart devices" like the iPhone in general, prevails two-dimensionality (and its material extensions), both in terms of electronics and of the interface (the screen). The layer-wise erasure of micro-chips from Western production by East German computing industry in the 1980s and 1990s has been no archaeological excavation but an analysis of electronic circuitry. Topological configurations (be it micro-circuitry, be it the infrastructural and protocol webs of the Internet) are the "field" rather than "layers" for media archaeological research.

A geologically notion of "deep time" of the media (even beyond Siegfried Zielinski's time frame for audiovisual media[4]) even goes down to mineral excavations, enriching media archaeology with ecological concerns. Once more, though, the archaeological metaphor prevails, when Jussi Parikka's *Geology of Media* (2015) which takes a material perspective on contemporary media culture in terms of ecological temporality, is described as "a media excavation" into the raw material basis of technological development.[5]

Radical media archaeology - in its technically "grounded" version - takes its departure from technology itself. It concentrates on the epistemological insights which can be derived from the close analysis of electro-mechanical artifacts, electronics, and finally computational machines; literally "fundamentally", media archaeology takes the *arché* at its mathematical face value: algorithmic rooting in numbers. The *logo* of media archaeology therfore is the quare root symbol "√".

Even the traditional academic science of Archaeology is not concerned exclusively with the material artefact unburied from the ground any more; a radical mathematisation of archaeological findings (in the early days of computing within the Humanities) has taken place in Archaeology. The challenge of "big data" avalanche and complexity nowadays can be mastered with by computational probabilities in a nonlinear way; here Digital Humanities (or computational philology) becomes a twin method to Media Archaeology. Digital Humanites, in its algorithmic approach, is operative "cultural analytics" (Lev Manovich), displacing the more discursive "cultural studies".

Sociologist Gabriel Tarde, in nineteenth century Paris, once defined „deux sortes de recherches que notre temps a mises en grand honneur, les études archéologiques et les études statistiques“; the statistician „jette sur les faits humains un regard tout abstrait et impersonnel"[6] - which is a non-human perspective on human culture.

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4 Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means. Cambridge (MIT Press) 2008

5 Jussi Parikka 2012, quoted here after: Michael Goddard, Opening up the black boxes: Media archaeology, 'anarchaeology' and media materiality, published 28 April 2014 in the online journal: New Media & Society, http://nms.sagepub.com/content/early/2014/04/27/1461444814532193. On the deep time of media Infrastructure, see: Signal Traffic: Critical Studies Of Media Infrastructures, edited By Lisa Parks and Nicole Starosielski, Urbana, Chicago and Springfield: University of Illinois Press, 2015

6 Gabriel Tarde, Les lois de l´imitation, Paris 1890 ,chap. IV (Qu´est-ce que l´histoire?), section „L´Archéologie et la Statistique“, 99 and 114

Walter Benjamin, in 1936, still compared the camera-man to the surgeon, just as Foucault focused on the clinical gaze.[7] In its radicalized operation, the *media*-archaeological gaze converges with technological *imaging* itself - like an optical scanner recognizes the material artefact, and the so-called "imager" is a device for deciphering QR-codes. Here, the very term technology unfolds in its literal sense, reminding both of material hardware manipulation (*techné*) and its coded operations (*lógos*).

Media archaeology refers to *both* aspects: the physical artefact (ancient Greek *techné*), *and* its mathematical analysis (*lógos*) when it comes to computational devices, which makes the composite term "techno/logy".

The application of techno-mathematical tools of analysis to archaeology[8] results in media-*active* archaeology, not reducing technological artefacts to their materiality but transcending it towards the mathematical.

Computer archaeology: case *E. T.*

Media archaeology is not just a theory but a research method as well; therefore its character is object-oriented and operational.

What separates computer archaeology from previous technologies is its double focus on both hard- and software. The obsolescence of past computing can not be reduced to the naive understanding of digging out its residual materialities, as has been suggested by the spectacular digging for Atari computer game cartridges a few years ago The antique computer game *E. T. - The Extraterrestrial* (1982) has become the target of a soft and a hard way of practicing media archaeology. Ironically, the soft version concerns hardware, and the hard version concerns software.

The economic failure of the computer game *E. T. - The Extraterrestrial* (1982), in the collective memory of media culture, has triggered the first crisis of that industry, leading to the literal "dumping" of both its hardware in the desert of New Mexico in 1983, almost returning silicon chips to elementary silcon (sand) - until it has been archaeologically re-discovered in 2014. But different from the classical cultural museum object, such technological devices - which are in a medium state only when processing signals - requires a new form of *processual media archaeology*.

Fig.: Photos from entry "Atari video game burial" https://en.wikipedia.org/wiki/Atari_video_game_burial (accessed November 10, 2017)

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7 See Markus Buschhaus, Über den Körper im Bilde sein. Eine Medienarchäologie anatomischen Wissens, Bielefeld (Transkript) 2005
8 See F. R. Hodson / D. G. Kendall / P. Tautu (eds.) Mathematics in the Archaeological and Historican Sciences (Edinburgh / Chicago: Edinburgh University Press / Aldine Atherton, 1971

The real "excavation" of computational devices is going to the roots of the programming code within, which requires disassembling the source code in radical technomathematical media archaeology. Digital Forensics is a twin to Media Archaeology when tracing data from erased or damaged computer hard discs; not by coincidence, it has been a literary scholar, Matthew Kirschenbaum, who introduced digital forensics into Media Studies.[9]

[Fig.: http://adamsblog.aperturelabs.com/2013/01/fun-with-masked-roms.html; Abruf 10. Juli 2014]

[Media archaeology as artistic research: "Dead Media"]

- Media artist Garnet Hertz produced a book which in the spirit (and explicitely "in memory") of Bruce Sterling's *The Dead Media Handbook* initiative from 1995. The exuberant title of Hertz' book aligns itself with the "antiquarian" discourse of the 18th century: *A Collection of many Problems Extracted out of the Ancient and Modern Philosophers: As, Secrets and Experiments in Informatics, Geometry, Cosmography, Horologiography, Astronomy, Navigation, Musick, Opticks, Architecture, Statick, Mechanicks, Chymistry, Water-Work, Fire-Works, etc., Wherennto is added, Dead Media*.[10] If we single out by chance (that is: by random access) any of such items, we find e. g. the drawing of a geometrical system for the measurement of dimensions, apparently from the late Renaissance, or - another case - the switch-board of an early computer installation in an office.

Fig.: http://underbelly.nu/product/a-collection-of-many-problems (accessed November 10, 2017)

Sterling's original "Dead Media" project had been intended to result in a book but started and ended with an online archive, finally disappearing into the Internet archive itself.[11]

Consequently, Hertz' monument to Sterling's "Dead Media" project itself re-aligns with the more reliable chance for enduring knowledge in the Gutenberg era. The printed book text and illustrations are technically authorized by material supplements, like scraps of paper stripes with embossment which apparently is Morse code. But what is declared as "dead media", in this case can principally be re-enenacted (thus: deciphered, read, sonified) today, just like the mesaurement instructions are mathematically valid still, and the switch-board continues in present day computing, though in alternative miniaturized forms. Melancholy is the expression of nostalgia for something we long for but can not reach any more, since it is entropically (irreversibly) gone. The the media-archaeological approach is non-melancholic, though.[12] Past

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9 Matthew Kirschenbaum, Mechanisms. New Media and the Forensic Imagination, Cambridge, MA (The MIT Press) 2008
10 Telharmonium Press in Hollywood, California, 2009
11https://web.archive.org/web/20071019055700/http://www.deadmedia.org/notes/index.html (accessed November 10, 2017
12 See definition of "Media Archaeology" in https://en.wikipedia.org/wiki/Media_archaeology; accessed November 30, 2017

media are un-dead, principally (*archhé*) re-activatable and thus in a potential latency state (Delta-*t*). Media-archaeological artefacts are embedded in another temporal logic which defies historisation; as long as they are not operative, they remain in "museal" latency; at any moment, though, they can be reanimated, like signals as a function of time.

[Media materialism and Circuit bending]

Dead media become alive in media archaeological investigation which does not refer exclussively to past artefacts but is dedicated to opening up technologies in the present, in a critical way: hardware hacking, software studies, and circuit bending.[13] Media archaeology is hence not simply about times past but also rather about microtemporal processes within technologies themselves - a differend kind of radical historicism.

Circuit bending is about short-circuiting of (low-currence) electronic devices in "catachretic" ways, in the field of sound to create nows kinds of sounds by means of a "jumper" cabel which connects two points in the circuit in a way not intended by the engineers; experimenting with mis-connecting results in interesting sounds, the result is being hard-wired[14], and the compilation CD *Noise and Toys* vol. 1 (2006); unearthing previously un-discovered sounds in electronic devices is a media archaeology of acoustic, of the "implicit knowledge" of an electronic medium; Lev Thermin's mis-using radio technology to create his T*heremin-vox* = circuit-bending by interference of the bodily gestures as cariable capacitor within the antenna circuit; finally, investigative media-artistic archaology provides for analog electronic circuitry which is capable of detecting, that is: sonically "unearthing", e. g., the presence of 13.56 MHz RFID tags used in plastic cards.[15]

What *mis*wiring is in Circuit bending of analog electronics, is *dys*coding in digital software where material wiring is replaced by symbolical programming. A case of symbolic Circuit beding is datamoshing *alias* glitch art. Datamoshing is the process of manipulating the data of compressed media files, especially video streams, in order to achieve visual or auditory effects in realtime, that is: while the file is decoded.[16]

Fig.: video example http://datamoshing.com; accessed 25 November, 2017

II VIDEO ARCHAEOLOGY

Media themselves as archaeologists: archaic video recording

Media archaeology aims at an *archaic* media experience: a "rarification" of discourse (Foucault). When performed by non-engineers and non-informatics, it

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13 For such media artistic practices, see the Microresearch lab, Berlin
14 See http://absurdity.biz
15 http://shop.marcboon.com/snifferkit.pdf
16 See "How to datamosh videos", http://datamoshing.com; accessed 25 November, 2017

is not a simplification, but a conscious analytical reduction to techno-logical essentials and *principles* (the Latin equivalent to *arché*). Media Archaeology therefore looks at the moments of technological emergency not in terms of historicism, but because technological structures become evident in their beginnings: "It is the beginnings of invented things, which appeal to me", writes Lance Sieveking (who wrote one of the first televisoin dramas transmitted by the BBC), and explains: "For it is at their beginnings, that we may detect their true nature", that is: their epistemological essentials. Sieveking is quoted as the *motto* of the memoirs of John Logie Baird *Television and Me*[17], which provides for a very archaeological insight into first steps of the electro-mechanical television apparatus indeed. "In principle, the *televisor* is both simple and ingenious", comments the brochure accompanying the model kit *The Televisor* , developed as teaching device by the Meddlesex University.[18]

For most media is true, that what developed into mass media later, has originally been developed for analysis, as measuring or storage devices in experimental research - which is the case for the Edison phonograph (preeceded by Scott's phonautograph, created to register the frequencies of the human voice for analytic purposes, before it was reversed into synthesis in replay), the kinematograph (preceded by chrono-photography), radio (Hertz' Karlsruhe experimental verification of Maxwell's mathematical equations on electro-magnetic wave propagation) and the television tube was developed out of a measuring device, Ferdinand Braun’s electronic oscilloscope. The oscilloscope itself, such as the TV tube which only metaphorically survives in the YouTube video channel. is a sub-class of the thermionic tube which functionally (if not historically) endures in transistors and the highly Integrated Circuits within microprocessors, and appeared on the media-theatrical scence even before humans could apprehend it: Edison, when experimenting with an improvement of his evacuated light bulb, incidently came across what became known as "Edison effect", which the inventor got patented without being able to explain the event - in fact the thermionic tube as diode, emanating in a glimmering shadow on on the inner glas surface, kind of non-semantic anticipation of the electronic image. In fact, the first fully electronic device for storing a literal "bit" has been the flipflop circuitry, consting of two interlaced triode tubes - therefore the metaphor re-turns from within.

Figs.: thermionic tube from MAF / its simulacrum as USB memory stick

Between the phenomenological surface of media (such as the proverbial television "tube") and their concealed *arché* opens a dramatic gap. Technological media are non-discursive formations which can rather be addressed in technomathematical terms. Media archaeology performs a micro-epistemology, that is: disovering, analysing and describing the epistemological sparks which spring from the most concrete level of technology itself, such as the delicate electronic saw-tooth signal generator) which creates the jumps of single cathode ray lines within a television set in order to create the impression of an electronic image for always belated human perception at all.[19]

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17 Edited by Malcolm Baird, Edinburgh (mercatorpress) 2004
18 www.mutr.co.uk
19 See A. J. Klopow, Grundlagen der Fernsehtechnik, transl. and supplemented by P. Neidhardt, foreword Manfred v. Ardenne, Berlin (VEB Verlag Technik) 1956,

Archaeoly in Foucauldeans terms deals with enunciations; this is what is *not* immediately visible, rather geno- than phenotextual.[20]

Let us have a look at an early US-American television set, the RCA 630-TS fabricated by RCA company:

Fig.: RCA 630-TS; see Radio Museum website;
http://www.earlytelevision.org/rca_630.html

But caution, such a photograph does not show a medium, not even a "dead" one, but a technological sculpture, since it lacks its essential medium definition: signal processing. The tube (mostly for museological preservation reasons, and obsolete communication engineering standards) remains empty here.

In terms of television studies, the 630-TS may have been among the first mass-sold television sets in the US (1946), but this is already the moment when the media-archaeological incubation epoque of its technology ends. Media Archaeology rather concentrates on the emergent prototypes such as John Logie Baird's electro-mechanic, Nikow-disc driven *Televisor* in the 1930s. At the beginning of Donald McLean's functional signal reenactment of early 30-line television image recording (resulting in his monography with the telling title *Restoring Baird's Image*) has been the misunderstanding of grammophone records in the archives of the BBC. Put on the turntable, it produced no musical sound; attached to the oscilloscope, figurative patterns took shape and suggested an archaic line-by-line television recording, media-archaeologically recalling Bill Viola's definition of the electronic image as the "sound of one-line-scanning", closer to the unfolding of sound from the grooves of a phonographic record than to the photographic or film image

Sonification of the electronic image in fact has once served as a media-archaeological, that is: analytic tool. Baird reports about his experiments to enhance the luminosity of his early television images. In testing out the amplifiers, he used headphones and listened to the noise of the vision signal made: "I became very expert in this and could even tell roughly what was being televised by the sound it made. I knew, for example, whether is was the dummy's head or a human face. I could tell when the person moved, I could dinstinguish a hand from a pair of scissors of a matchbox, and even when two or three people had different appearances I could even tell one from the other by the sound of their faces. I got a gramophone record made of these sounds and found that by laying this with an electrial pic-up, and feeding the signal back to a television receiver I could reproduce the original scne. <...> If the cinema had never been invented the 'Phonovisor', as I christened the device, might have been worth developing; it was certainly an intriguing process. Vision into sound and sound back into vision."[21] *Listen*:

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chapter 5 (50-99)
20 See AdW: 158, and Falk 1976: 310 f.
21Television and Me. The Memoirs of John Logie Baird, ed. Malcolm Baird, Edinburgh (mercatpress) 2004, 64 f.

Fig.: (c)Phonovision-Stookie-Bill-SWT515-4

But only by the intermediary retroactive application of specially written filter software, i. e. by digital processing of the damaged signals, could these original grammophonical recordings be "restored". It is not the original recording which is replayed, but an algorithmicised re-enactment.

[What the computer screen seems to re-play, is not the original recording, but an re-enactment, a digitally sampled and processed emulation of 30-line electro-magentic vintage television. What sampling (according to the Nyquist / Shannon theorem) can achieve is the "faithful" reproduction of the electro-physically "analog" signal in high fidelity. This is logical modeling; what it can not achieve, though, is the truly co-original re-generation of the television signal amplitudes derived from photo cell-based linear electronics.]

Once again, Media Archaeology as practice-based research reveals its double sense of techno/logy: on the one hand it is about restoring the materiality of mechanical or electronic devices, but in order to restore the signals, it nowadays deals with mathematized meta-realities as well. Computers and algorithms themselves here become active media archaeologists.

McLean describes the metamorphosis of time signal into timeless information once it has been sampled: "The signal is now digital and is the starting point for digital signal and image processing" (ibid.). "Line by line, the correction values plot out the profile of errors in the signal's timing."[22]

In such a moment media archaeology is not just a method of human media studies any more, but digital media themselves become the agency of technical reconnaissance below historical consciousness. "If it were not for computer technology, Baird's *grammophone videodiscs* would continue to be curiosities that merely hinted of a time before television as we know it. Their latent images would remain unseen and the information imbedded in them would still be compeltely unknown" (ibid.).

McLean heroically resists the classical archaeology metaphor: "Unlike traditional archaeology, the artefacts are not embedded in layers of history but have existed in both private and public collections, largely ignored as curiosities"[23]; media time is time of latency. Therefore, Baird's *Phonovision* is not a "dead medium" (in Bruce Sterling's sense), but an aggregation, wainting to be re-processed in order to become a true medium (in operation) again.

Another case of "re-presencing" early television recording is the picture disc which has been attached to the Voyager satellite for future communication with extra-terrestial intelligence. It has been an anachronism already in the moment of its launch into space in the 1970s. As a technological rebirth of early scan-line TV image recording the picture disc demonstrates that media archaeology is not necessarily about the past but as well describes a recent (and ongoing) present.

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22 McLean 2000: 93
23 McLean 2000: xvi

A split approach is required for a successful analysis of the techno-phenomenon of 30-line television: both in historical (contextualizing) terms (Science and Technology Studies) *and* in media-archaeological terms (as literally object-oriented research, allowing for its material / logical "vetos"), resisting the historiographic quest for "coherency" (the metahistorical "emplotment", according to Hayden White). The very nature of technological objects necessary creates a dis-continuity between human (narrative) and nonhuman (artefacts) point of view, to which Bruno Latour, in his "Actor Network Theory", paid attention.

[Correcting the time base: non-human video tempor(e)alities]

No technological analysis is complete unless we possess a notion of its appropriate time-concept; *media* archaeology is concerned with techologies not only on their (infra-)structural but as well on their *operative* level. With a signal being the physical representation of a message respectively information, any electronic media event is a function of time signals ("Zeitfunktionen der Signale"[24]) - an existential temporal form which, in this case, coincides with the technological act of induction itself.[25] The distortion of the images resulting from its scan lines - very different from the logics and "artefacts" of algorithmic image compression - brings out the "analog".

In chapter 5 of her *Autobiography of Video*, Ina Blom describes the emerging technologies of time control in the 1970s which are the Kantean *a priori* of video-specific temporalities; indeed this new video-temporal aesthetic can not be explained in terms of social or economic trends any more (like "portable TV production").

Siegfried Zielinski's writings on video accentuate how its application to television resulted in "time souvereignty" against the pre-scheduled TV programs both for producers and consumers. But this concerns its social use; time-critical media-archaeological analysis of video goes directly into its technology.

- Video-technical micro-temporalities irritate the human temporal sense. Difficult, of course, is the dilemma which faces all textual analysis of video and related works. Ekphrastic descriptions of single works in minute detail leave readers unconfortable, since they can not control the description against the signal event. Photographic video stills can not make up for the physiological effect of moving electronic scan-line images. How can the micro-movements described in time-critical analysis ever be caught in textual description - a dilemma which faces all textual studies of time-based and time-critical media. The alternative is to "write" videocity in its own medium - just like Jean-Luc Godard's *Histoire(s) du cinema*.

24Karl Küpfmüller, Die Systemtheorie der elektrischen Nachrichtenübertragung, Stuttgart (Hirzel) 1974, 393

25 For an online re-presencing of the moving image sequence see http://www.tvdawn.com/earliest-tv/the-silvatone-recording-1933 (accessed November 2013)

- Obvisously, terms like "video mind", "video life", "autobiography of video" in Blom's monography are not meant in a metaphorical sense; the real message is the insistance of cybernetic "generative aesthetics" which equally pervades (as expressed by Norbert Wiener) human *and* machine systems when it comes to temporal signal processing. As expressed in the "video times" chapter, the "availability of new and more precise technologies of time control during last half of the 1970's (dynamic tracking, digital time code editing, time base correctors etc.)" opened access to a non-biologistic, bodyless experimentation with electronic "live" (instead of "life") signals, discovering genuinely chrono-poetic media tempor(e)alities.[26] The electronic emphasis on time control constituted "a displacement from the social models construed around the concept of «video life»" (communication Ina Blom, March 2014). There Blom is tracing the *individuation* of a specific "video" in the 1960s and 70's in the sense of Gilbert Simondon's thesis *Du Mode d'Existence des Objets Techniques*, Paris 1958). From this perspective, even Bill Viola's mysticism becomes a function of "brain-like" electronic technologies (cybernetic neurological research). Theefore Blom's use of the term "autobiography" for a technological device is rather counter-narrative; the crisis of narrative culture is itself media-induced. The media-archaeological point of view, defending the "non-human rights" of technological achievements such as electronic video, de-metaphorizes the term "life" which comes with all the many quasi-biologist associations which has been attached to early video by the media artists themselves in the late 1960's / early 1970's; in terms of cybernetics, it is all signal transduction and signal "processing" - in the animal and in the machine, equally (Norbert Wiener 1948)

Applied media archaeology: video art preservation

Despite the theoretical objection against the archaeological metaphor for media-archaeological analysis, there is an "archaeological" aspect of media culture in the more traditional sense indeed. Adopting to the techno-logical time regime, the core decision for media art museums is between preservation of aesthetic content vs. preservation of technological form, as has been discussed for the cultural heritage of a century of cinematography already. In the phenomenological, content-focused perspective on media art, "[t]he material experience of film is neither celluloid nor its electronic variants as magnetic tapes or circuits, but rather the flow of light that reaches our eyes."[27] But the aesthetic message comes from within the technological structure of the work itself. Technical vulnerability is not an external threat but an essential feature of "enduring" media-artistic articulation.

When Ampex company introduced the video image tape recording in April 1956, it was not meant as an enduring memory device. In the Platonic sense of media critique of alphabet writing, it is obvious that (like writing on a wax tablet) its real message is obilivion, since it allows for the immediate erasure

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26 See Wulf Herzogenrath, Der Fernseher als Objekt: Videokunst und Videoskulptur in vier Jahrzehnten, 110-123, in: same author (ed.), TV-Kultur, Dresden 1997

27 Barbara Flückiger, Material properties of historicla film in the digital age, in: NECSUS. European Journal of Media Studies 2012: 3 = www.necsus-ejms.org/material-properties-of-historical-film-in the-digital age

and over-writing of the recorded signals.[28] A straightforward strategy for electronic image preservation has been filming it on celluloid from the monitor. The media-archaeologically formative times of television broadcast technology just knew "live" transmission; the Marconi Company (GB, 1957) developed the Marconi Telerecording, a recording from screen by film camera with fast intermittent mechanism, while sound was recorded on a sychronized tape recorder with perforated recording material (double tape). But parallel to this kind of "iconic" documentation, it is mandatory to preserve the circuitry diagrams of electronic media art, which were explicit in the hard-wired "scores" of David Tudor's electro-acoustics at the *Nine Evenings* in New York, 1969 - towards an archive of operative diagrams.

David Claerbout's video projection *Ruurlo, Bocurloscheweg, 1910* [29] takes its departure from an ancient postcard but delicately "animates" the leaves on the central tree in this landscape image. Long-time preservation of such a video installation requires the most precise time-base correction of the electronic image lines. The time base corrector has been the moment when the "digital" entered the otherwise analog television and video production those years (just like Erkki Kurenniemi's digital control mechanism of electronic music synthesizers in Helsinki in the 1970s). The TBC, developed esp. for colour signal correction, is a delay-line and master-clock (sync genrator) based digital device for intermediary buffering and feeding back image frames, with the delay interval (delta-*t*) ranging between zero millisecond and the length of one complete frame. Distortions of the electronic image derive from mechanical friction in analog videocassette recorders. Video preservation is not only about maintaining a cultural object across generations, but about preserving the technological "time object" (Edmund Husserl) itself.

There is even a media-ecological aspect of energetic cooling systems for video tape preservation; the cultural impact of the museum, especially the preservation and memory of media art, can be sustained only through the materialities and energy costs of its own "media" infrastructure, resulting in a trade-off between thermodynamic and informational entropy which has to be renegotiated again and again.[30] But this is not a "deep" temporal extension, but a radically challenging presence, the most actual manifestation of media archaeology.

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28 See Jens Schröter, Einige Bemerkungen über löschbare Bilder, in: Katalog Videokunstfest Bochum 2000 (?), 116-124 (116)

29 1997, no sound, s/w, 60' loop; see https://vimeo.com/171214749, accessed December 1, 2017

30 Such is the topic of the current post-doctoral research project by Samir Bhowmik (Media Lab, Aalto University School of Arts, Design & Architecture Finland), "The Museum is the Message: An Archaeology of Power, Memory and Materiality of Digital Heritage"; see idem, *Deep Time of the Museum: The Materiality of Media Infrastructures*, doctoral dissertation, Aalto University, Helsinki (Aalto Art Books) 2016