[Wolfgang Ernst: NOTES ON TECHNICAL MEDIA]

NOTEBOOK "'DEEP' MEDIA TIMES"

[unedited cursory notes, theses, excerpts, grouped into thematic blocks]

Thematic blocks:
- *Technologies of Tradition*
- "*Deep*" *Media Times*

Detailled content of thematic blocks:

Technologies of Tradition:

TECHNOLOGIES OF TRADITION
- Computational Archaeology (proper)
- Computational Epigraphy

"*Deep*" *Media Times:*
NOTES ON "DEEP" MEDIA TIMES
- Experimental time *versus* history of knowledge
- Displacing narrative media history: diagrammatic media archaeography
- Confessions of an Ex-Historian
- How Not to Write Media History?
- On the term "equiprimordiality"
- Experiencing media tempor(e)alities
- Chrono-technical irritations

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Technologies of Tradition:

TECHNOLOGIES OF TRADITION

Computational archaeology (proper)

- "archaeographical" digital computing techniques; René Ginouvès / Anne-Marie Guimer-Sorbets, La Constitution des Donnés en archéologie classique. Recherches et expériences en vue de la préparation de bases de donnés, Paris (Éditions du CNRS) 1978; distinguish "*descriptive* '*archaeography*' " of material findings "from more *interpretative archaeology* in a narrower sense" = C. A. Moberg, Archaeological context and mathematical methods, in: ibid., 551-562 (533); *Jacques Spon*, Recherches curieuses d'antiquité, Lyons 1683, Preface, sig. a3r: '*Archaeographia* est declaratio sive notitia antiquorum monumentorum'"

= quoted after Anthony Grafton, Bring out your dead. The past as revelation, 2001, 338 (notes to pp. 193-196), note 63

- technological methods in archaeology - in fact from the material (digging / material excavation) to the data-processing epistemology = Maier 1977: 27; Riederer / von Rohr (eds.) 1973: Kunst unter Mikroskop und Sonde. Naturwissenschaftliche Untersuchungen an kulturhistorischen Objekten; F. R. Hodson / D. G. Kendall / P. Tautu (eds.), Mathematics in the Archaeological and Historican Sciences, Edinburgh / Chicago (Edinburgh University Press / Aldine Atherton) 1971; statistical methods, quantification and computer processing of data not preventing / relieving the technically registered data from the need to be interpreted by human evaluation; mathematics - in a circular argument reminiscent of Alan Turing's statement on "computable numbers" (1936/37) - helpful in sharpening aspects of analysis which *can* be made pure mathematical (Kendall), no certainty but reducing the level of uncertainty = front flap

- structural affinity between archaeology as material-orientated science, and computing, in a auxiliary and a methodological sense - as opposed to philology, as long as its hermeneutic method is not being replaced by statistical analysis = Liliana I. Boneva, A new approach to a problem of chronological seriation associated with the works of Plato, in: Hodson et al. (eds.) 1971, 173-186

- archaeology one of the first sciences in the humanities department applying machine computation; J. D. Richards / N. S. Ryan, Data Processing in Archaeology, Cambridge / New York / Melbourne (Cambridge University Press, 1985); at the same time, data processing *as* archaeology (for that reason the book mentioned is, for its most part, an introduction into computer programming). Media archaeology is not just a way of remembering "dead media", but rather a mathematical aesthetics; modelling, statistics and especially cluster analysis (e. g. for the distribution of objects in a grave field) one the fields where archaeology made use of data processing with electronic computers

- mathematization of archaeology: "[...] the contribution of IT and statistical techniques have a central role to play in supporting archaeological interpretation. The archaeological judgment must take precedence yet making that judgment is frequently not straightforward. Even the beneficial contribution of such 'hard' science such as radio carbon determinations of date or ground penetrating radar to archaeological interpretation, rely on operators having a close empathy with archaeological material, the context of discovery and the role of post-depositional processes. If the post-processional reaction to the scientific inductivism of the 'New archaeology' of the 1960's shows us anything it is that we need to be aware of the contexts in which we may apply our tools, be they computers or trowels" (communication Peter Rauxloh, Information Strategy Manager, Museum of London, July 2002)

Computational Epigraphy

- between the material monument and the philological text record: the epigraphic inscription = Alexandra Stefan, Applications of mathematical methods to epigraphy, in: Hodson et al. (eds.) 1971, 267-275; practice of constructing genealogical filiation of manuscript tradition in the diagramatic form of *stemma* applying a mathematical method; monks copying an ancient manuscript for tradition "made mistakes, either involuntary (carelessness) or voluntary (the desire to correct the source)" = Sorin Cristian Nita, Establishing the linkage of different variants of a Romanian chronicle, in: ibid., 401- 410 (402); as well Yannis Assael / Thea Sommerschield / Jonathan Prag, Restoring ancient text using deep learning: a case study on Greek epigraphy, in: Proceeedings of the 2019 Conference on Empirical Methods in Natural Language Processing (EMNLP), Hong Kong (Association for Computational Linguistics) 2019, 6369-6376, online (submitted 14 Oct 2019) https://arxiv.org/abs/1910.06262v1; focus in epigraphists' conjectures only on missing characters as elementary alphabetic unit, thereby focussing on syntactical recurrent patterns; no sub-symbolic fragmented signals / "noisy" inscriptions. "The encoder takes an inscription text x as input, where the symbol
‘-’ denotes the missing characters, and ‘?’ the blanks to be predicted." = Assael et al. ibid., subchap. 4 "Restoring text using PYTHIA"; no "analog" approach to damaged characters as "signals" (Roch); Siegert, "Cacophony"; Packard Humanities Institute's searchable Greek inscriptions already conditioned by a/d conversion

- optical character recognition / visual analysis restoring frictions between in-formative inscription and fractured materiality to (coded) readability; frictions between the symbolical order (alphabetic characters, words / spaces) and material enunciation; most precise scenario of entanglement of negentropic *lógos* with entropic matter; artificial neural nets such as PYTHIA based on already digitized / optically character-recognized sequences of letters; "To train it, we wrote a non-trivial pipeline to convert PHI, the largest digital corpus of ancient Greek inscriptions, to machine actionable text, which we call PHI-ML" = Yannis Assael / Thea Sommerschield / Jonathan Prag, Restoring ancient text using deep learning: a case study on Greek epigraphy, in: Empirical Methods in Natural Language Processing (EMNLP), submitted 14 Oct 2019, online: arXiv:1910.06262, "Abstract"; PYTHIA and PHI-ML "open-sourced" at http://github.com/sommerschield/ancient-text-restoration, note there: "When using any of this project's source code, please cite:
"@inproceedings{assael2019restoring,
  title={Restoring ancient text using deep learning: a case study on {Greek} epigraphy},
  author={Assael, Yannis and Sommerschield, Thea and Prag, Jonathan},

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  booktitle={Empirical Methods in Natural Language Processing},
  pages={6369--6376},
  year={2019}
}"
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- digital corpora for performing “string matching” searches: machine learning hereby already operating *within* the techno-symbolic regime, thereby missing the (mate)real dimension of fractal characters; material obsolescence / cracks of epigraphic stone irruption of the real into the symbolical order / frictions; in damaged inscriptions disruptive signal- (or rather: character-)to-noise ratio; "signals from the past"

- alphabetic writing, while itself a negentropic effort in cultural tradition, materially entropic (wear of essence, e. g. with chalk on board (argument Flusser)

"*Deep*" *Media Time:*

NOTES ON "DEEP" MEDIA TIMES

- implicit Hegelianism in Kittler's analysis: in computing, all previous media systems "aufgehoben" - end of technological history, vs. media-archaeological rupture

Experimental time *versus* history of knowledge

- technological eventuality as time signal vs. history; experimental diagram vs. historiography which is the act of symbol registering, both by measuring media or humans, in the laboratory

- experimental settings, being unnatural / artificial, belonging to cultural knowledge; on the other hand, from the point of view of the media themselves, that is: the media-archaeological perspective, something at work which is indifferent to historical change, the "time-invariant event"

Displacing narrative media history: diagrammatic media archaeography

- media archaeology concerned with media not only on their structural but as well on their *operative* level, thus becoming "post-structural" or "diagrammatic" defined as a "'geste symbolique', une abstraction qui en même temps contient des aspects essentiels du geste et des directions vers la pensée symbolique. Ce lien conceptuel est exactement ce qui est au centre de la pensée dite 'diagrammatique' [...] une [...] formulation du rôle intermédiaire du diagramme entre le geste et le symbole" = Guerino

Mazzola, La Véritè du Beau dans la Musique, Paris (Delatour France) 2007, 153; generative archive: "Le diagramme n'est pas inséré dans une machine, dans un système des règles, il est un générateur" = Mazzola ibid., 154; post-structural vector of media archaeology (or of a diagrammatic media theory) beyond semiotics and closer to signal analysis, with a signal being the physical representation of a message respectively information; any media event "Zeitfunktionen der Signale" = Karl Küpfmüller, Die Systemtheorie der elektrischen Nachrichtenübertragung, Stuttgart (Hirzel) 1974, 393

- media historiography already open for non-linear models of media time; media archaeology, in its radical, categorical critique of the historical discourse, in danger of establishing a "strawman" (a false non-existing position)?

- operative diagrammatics not restricted to the electric circuitry of analog media, aiming at understanding how digital media put mathematical algorithms into operation, how it technically transforms algebraic formulas into commands, and how engineering routes and automates functions that humans have mistaken as exculisvely human before

- Media Archaeology not aiming to relegate Media Studies as part of the Sciences Faculty (mathematics, engineering) exclusively; as well rooted in the philosophical faculty ("Humanities") since its ultimate target of technological knowledge is to make explicit the epistemological insights which are implicit in the technical commands, executions and operations

- temporal aesthetics of Media Archaeology a-historical; it is not about contextual information about past media, but creating situations where getting into contact with media in its radical operability and temporality; studying the papers of the Turing estate in the archives of King's College, Cambridge, not resulting in a historian's contextualization of past discourses but in sharing the mathematical situation in its non-historical presentness - which applies to the turingmachine (*alias* computer) itself; its operational functions are the media archaeological momentum which is, essentially, un-historical

- "radical" media-archaeological approach to media temporality mathematical by nature; Fourier-Analysis transforming the time axis of wave form signals such as acoustic vibrations or electronic image scan lines into the frequency domain: "Eine Archäologie dieser Frequenzen wäre in dem Moment gewährleistet, in dem "es gelingt, einen Zeitbereich ganz ohne Metaphysik und Geschichtsphilosophie in den Frequenzbereich zu transformieren" = Friedrich Kittler, Draculas Vermächtnis. Technische Schriften, Leipzig 1993, 200 - a geometrization which, according to Bernhard Vief, has been prefigured by the spatialization of oral speech as vocal alphabetic notation already

- techno-epistemological media archaeology; operativity of circuit diagrams which transduce electric signals

- technical devices becoming "media" only in instanciation; such operativity embodies a different temporal logic compared to "historical time"

- cybernetic epistemology implied by the "digital retro-action" idea of a feedback-loop between analogous past and digital present addresses the "archival", discrete paradigm of past-as-databank(s) as opposed to analogue, narrative historiography in linking past to the present

- digital retro-action in a techno-active sense by the digitization of analogue source material from the audio-visual (broadcast media) archives and in the present: translating analogous world into a digital matrix; referring to the past, digitization of records from the past affects paper with new options of accessablity by intelligent search algorithms, as well images and sound; micro-temporality in the operativity of data processing; computers "retro-actively" transforming narrative aesthetics into non-discursive, algorithmic configuration of events

- archaeographical style of writing contradicting the requirements as stated in the general introductions of most "Guidelines for Contributors" of entries to encyclopedias (ranging from the "objective tone", the "impartial", the "overview of the topic", the reduced "case material", and the non-assumption of "any special knowledge" from the expected reader side); focus on "technical" media archaeology a problem in text genres such as lexica, dictionaries, or encyclopedias, or "introductions"; idiosyncratic writing rather highly biased, not impartial, less "educational" discussion of topics; genre of an encyclopedia entry not harmonizing with rather passionate mode of archaeographic writing, rather tending to manifesto-like declarative style, than to required "objective tone"; highly "partial" book project *Technológos in Being* rather unfolding a radical media archaeological method without compromise

Confessions of an Ex-Historian

- "what a difference it makes to be trained as a historian" = Ulrik Ekman, 4. April 2019, resp. AGENDA2000 manuscript; thereby having "a consistent and intensive preoccupation with time and with earlier modes of mediation which informs almost everything", vs. Ekman's training as a computer scientist first, then primarily in the languages and literary theory; ex-historian "much more concerned with memory and the historical past [...] and not least a topologist of the present" - rather media archaeology; focus on more recent developments", such as "ubicomp" / Miyazaki's bias; historical training and the archaeological

approach tending "to marginalize the treatment of spatial mediational concerns" such as urban topology (Ekman)

- "past" thoughts on narrative and media (from the "past" themselves); ex-historian's concerns (with its focus on "deep" time and memory and a critique of conventional historiography) receeding into the background, making place for investigating the core scene in the micro-media theatre of technology: the encounter of *lógos* and matter; focus now on topologies of the present media condition (against which media-archaeological approach, sometimes, tending to be "untimely"; that anachronism identified as genuine media temporality; critique of the "new metaphysics" in current "machine learning" discourse

Ulrik Ekman's forthcoming chapter "Informative Autobiographies", on a renewed narratology; emphasis on nonhuman forms of narrative; "autobiography" from a nonhuman, media-archaeological view Ina Blom, The Autobiography of Video. The Life and Times of a Memory Technology, Berlin (Sternberg Press) 2016; archaeogrphy of "transition states" more precisely in the scientific sense, not simply read as a metaphor; "contingent" tempor(e)alities and the critique of anthropocentric narrative

- less concerned with the archive as cultural practice, or artistic interface metaphors, in terms of discourse, but rather with issues of media techno*lógos* thought *from within* the technical apparatus - a more radical media archaeology

How not to write media history?

- media demanding non-historicist modes of representation of their occurrence in time; act of registration (recording) inscribing reversibility into time

- the "technical" not merely subject to the axis of time (time-based media), but capable of manipulating it actively (time-critical media), representing temporal statements. In contrast to historiography and historical monuments, for which time is the object but just symbolically represented, technical configurations are capable of operating (as) time itself; techno-intrinsic temporality demands another kind of media philosophy of time, such as "the temporality of ergodic art" = Espen Aarseth, Aporia of Epiphany in Doom and The Speaking Clock. The Temporality of Ergodic Art, in: Marie-Laure Ryan (ed.), Cyberspace Textuality. Computer Technology and Literary Theory, Bloomington / Indianapolis 1999, 31-42; Aarseth does not consider it in accordance with the probability mathematics of Norbert Wiener; Frank Furtwängler, Human Practice. How the problem of ergodicity demands a re-animation of anthropological perspectives in game studies, in: The Aesthetics of Net

Literature. Writing, Reading and Playing in Programmable Media, ed. Peter Gendolla / Jörgen Schäfer, Bielefeld (transcript) 2006

- media archaeology an attempt to account for this alternate temporality of media; linear prediction – developed in the context of antiaircraft defence and fire control during World War II, but used today as a probability indicator in all aspects of life – a model here. It represents the calculations that form the basis of Wiener's time-critical research; analogy to current micro-temporal economies – such as computer games – insofar as their operativity is equally as time-critical as it is (seemingly) infinite in its combinatorics; question already raised by Leibniz in his fantasy *Apokatastasis panton*, an early version of Poincaré's return on the basis of the combinatorics of all letters in a library; *The Library of Babel* (Jorge Louis Borges)

- Heidegger's "Kehre" (turn): no historical existence (*Dasein*) could have invented the radio, but – conversely – technological media, such as the radio, determine historical ways of being (*dazusein*)

On the term "equirimordiality"

- equiprimordiality as time being and time givenness of technical media; Michael Inwood, A Heidegger Dictionary, Oxford / Malden, Mass. 1999, 31: Heideggerian "gleichursprünglich" = "equiprimordial", "equally original"

- "*Cronopete is a Linux clone of Time Machine, the backup utility for Mac from Apple.* It aims to mimic it as closely as possible. The name comes from anacronopete ("who flies through time"), which is a time machine featured in the novel from Enrique Gaspar y Rimbaud, and published in 1887 (eight years before than H. G. Wells'Time Machine)" = http://www.rastersoft.com/programas/cronopete.html

Experiencing media tempor(e)alities

- abondoning the transcendet notion of "time": for case "historical time", replace by (Boltzmann-) *entropy*; for case of temporal cuts: *time-criticality*

- technical *Eigenzeit* (the temporal logic inherent to its technologies) shapes the collective perception of time in media-specific ways; time itself looses its transcendent character and gets grounded in operativities. "Zeit ist damit auch die Herausforderung einer Medienwissenschaft" = Stefan Rieger, Kybernetische Anthropologie. Eine Geschichte der Virtualität, Frankfurt/M. (Suhrkamp) 2003, 143. Apart from its "social media" content, the message of the dominant

communication platform of today, the World Wide Web, once analysed on its operative level, is its temporal processualities and eventalities

- essence of technological media: their operative, processual, that is: temporalized mode of existence; only when being in operation a medium is truly in the medium state, otherwise the apparatus a piece of furniture; David Morley, Television: Not so much a Visual Medium, more a Visible Object, in: Charles Jenks (Hg.), Visual Culture, London / New York (Routledge) 170-189

- tele-communication extending to temporal de-distancing (Heidegger), compressing the temporal gap between past / the present; from spatial to temporal *proxemics*. "Time capsules make the timeline shrink. [...] Time machines [...] have the capacity to make the timeline implode altogether by teletransporting past things, no matter how far off temporally, to 'recency'" = René Munnik, Technology and the End of History. From Time Capsules to Time Machines, in: Liisa Janssen (ed.), The Art of Ethics in the Information Society, Amsterdam (Amsterdam UP) 2016, 106-109 (109); thereby, their "pastness" is destroyed

Chrono-technical irritations

- traditional model of cultural history challenged by the chronopoetics of technical artefacts; focus on temporal processes "within" concrete technologies (from analog to digital); irritative (even traumatic) impact of media temporalites on the human sense of time and finally results in most fundamental questioning of how media technologies are situated within of apart from traditional historical time

- addressing media culture under the focused perspective of its technological tempor(e)alities; close analysis of time-critical moments within media technologies, followed by descriptions of how media temporalites affect and irritate the traditional human sense of time, and finally questioning the traditional position of media time within cultural history; escalations of so-called time-based media analyzed in terms of time-critical processes, that is: procedures where the temporal moment is decisive for the overall success of the operation at all; requires most precise technical description on the one hand, and its media-epistemological explication on the other, in order to derive sparks of knowledge enriching the traditional philosophical discussions about the nature of time. Far from remaining a transcendental signified, time itself thereby turns out to be radically pluralized by technological tempor(e)alities which generate a plethora of techno-mathematical terms enriching the vocabulary of temporal semantics - from delay time up to the autocorrelation function; delicate microcosm of technical time figures deserves epistemological reasoning, beyond the functional interest of engineers