TEMPORALIZING THE PRESENT, RE-PRESENCING THE PAST. Chronotechnical Realities

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I TOWARDS A MEDIA-EPISTEMOLOGY OF TECHNOLOGICALLY INDUCED TEMPORAL SENSATION

IRRITATIONS OF "THE PRESENT"

Archiving the present & co-presence of the past: A technological Moebius loop
Disruptions of the present preserved by and generated from within technological media
Methods in *Widerstreit*: Archaeology *versus* phenomenology of media-induced presence

THE TEMPOR(E)AL IN THE CINEMATOGRAPHIC APPARATUS

"Sampling" the visual present (self-recursive images, thumbnail movies, kinematographical projection)

ARCHIVING THE PRESENT. Irritations of Presence by human and non-human micro-storage events

Auratic presence and the aesthetics of "live"
Motion analysis and the "time-window" of presence in neurological terms
Intermezzo: "live" transmission in radio and television
Instantly recording the present
On Douglas Rushkoff, *Present Shock*
Between storage and interaction with the present: Time-critical signal manipulation (magnetic tape, video recording)
Archival manipulation of the already present: Real-time editing
Between analog and digital (non-)temporality: the photographic snap shot as temp"aural" moment

TEMPORALIZING THE PRESENT (DIFFERENTIAL DELAY)

Media analysis of the present in high frequency
The algorithmic "Markov present"

THE TEMPOR(E)ALITY OF AFFECT

Traditional and posthuman understanding of affect
The micro-temporal momentum of affect
TempoR(e)alities and "The Crannies of the Present" (Massumi)

MEDIA-ARCHAEOLOGICAL "AUSCULTATION" OF TECHNO-CULTURAL MICRO-TEMPOR(E)ALITIES

New "shapes of time"
Electronic media tempor(e)alty: "acoustic space" (McLuhan)
"Liquefying" the archive
Not yet memory? Focus on storage tempor(e)alities
Micro-archiving the present: Intermediary storage, delay lines

"Time of non-reality": *Totzeit*, negative time
"Less than no time": Telegraphy and the undertunneling of the transmission channel
The micro-temporal *camouflage*: High Frequency Trading
Interplay: Gaming with the Pin Ball machine and time of the tape: spools, loops
Micro-archiving presence from analog to digital technologies: functional soundings
The fuzzy present of Internet communication
Signal run-time as acoustic media archaeology
The sonic present

II RE-PRESENCING THE PAST

RESONATING "HISTORY"
Media-induced shock more general
"Shock" with Benjamin
Media-induced presence / "Realtime History"
The anachronistic momentum of technical recording
Sonic "Immediacy": Dissimulated presence

THE TECHNO-SONIC. How does sonicity affect and irritate human time consciousness?
Analysis of the "sonic"
Husserlean vs. Aristotelean time: Sonic "rhythmograms" vs. clocking
„Presence“ in audio technology
Micro-archiving sonic presence with analog technologies
Sonic Media Temporalities: From Analog to Digital
Sound pulses human / inhuman: Heart beats as affect of life
The sono-traumatic affect
The phonograpihc Nipper effect: "shocking" logocentrism
Sonic choque: Telephone call and answering machine

SONIC "RE-PRESENCING" AND TECHNOLOGICAL VOICING OF THE PAST
Sono-chronic tunneling of historical distance
Future in the past: Storage driven by a virtual trauma
Disembodied voices from analog to digital analytics
"Videotestimonies" in Holocaust memorization
The technological momentum of "Messianic" time: Digitized video testimony

I TOWARDS A MEDIA-EPISTEMOLOGY OF TECHNOLOGICALLY INDUCED TEMPORAL AFFECTS

IRRITATIONS OF "THE PRESENT"

Archiving the present & co-presence of the past: A technological Moebius loop

In media culture, a new drama unfolds: the chronopoetics of micro-temporal processes. Electronic transduction that converts signal into informational

aesthetic form and human-computer interfaces, the speed of micro-processes, recursive algorithms and feedback loops all result in new ways of negotiating "the present".

Time-critical action in electronic and digital technologies develops into an epistemology which radically challenges traditional "grand" temporal horizon spanning between a heavy "historical" past and an emphatic future, with a shifting emphasis on actually non-linear, algo"rhythmic"[1], con-temporary events.

Such augmentation of the present happens in the tight coupling of human / machine time such as in media art, resulting in resonant oscillation (analog) and high frequency pulsation (digital). Analytical aesthetics of technologically induced sensation deals with such affective temporalities.[2] But different from the phenomenological or neuroscientific focus on the human time-window of the present moment (roughly three seconds), media-archaeological analysis concentrates on the techno-mathematical temporal condition of signal processing itself. "Media archaeologists [...] describe the non-discursive practices of the techno-cultural archive. Media phenomenologists [...] analyze how phenomena in various media appear to the human cognitive apparatus, that is, to the mind and senses."[3]

The media-epistemology of technologically induced temporal affects ties together a two-fold analysis of the techno-affective time field:

a) Temporalizing and archiving the present (technically corresponding with analog delays and digital intermediary storage) - not to be confused with "archiving presence"[4]; the technical storage and institutional archivization of "presence" is a much more diffuse topic, as already discussed by Walter Benjamin's notion of "aura".

b) Re-presencing the archive in shock-like, traumatic manners since phonographic recording.

The current transformation of "analog" media recording into the digital one is dramatic for memory culture. In the transformation from analog to digital transmission media, the act of archiving presence takes place. The digital present condenses into an archive in front of our very eyes.

modMEDZEIT-AFFEKT / Whereas analog broadcasting (radio, television) has

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1 See Shintaro Miyazaki, Algorhythmics. Understanding micro-temporality in computational cultures, *online* in: Computational Culture, Issue 2 / 2012; http://computationalculture.net

2 See Eleni Ikoniadou, The Rhythmic Event, Cambridge, Mass. / London (M.I.T. Press) 2014

3 Kjetil Jakobsen, Anarchival Society, in: Eivind Røssaak (ed.), The Archive in Motion. New Conceptions of the Archive in Contemporary Thought and New Media Practices, Oslo (Novus) 2010, 127-154, section 6

4 See Hans Ulrich Gumbrecht, Production of Presence. What meaning Cannot Convey, Stanford, Calif. (Stanfort UP) 2004

been connecting the viewer to the event in front on the camera in temporal indexicality ("live" transmission), digital signal transmission is "archival" per definition: it takes intermediary computation ("real time"). Digital media culture is an archival structure - though a micro-archival one, the "algorithmic archive".

The most radical form of "archiving presence" is the encapsulation of traumatic experience; according to Mardi J. Horowitz "a traumatic experience remains in a kind of memory storage". There is a link between the "presence affect" and storage theory.

“One of the major features of trauma is its inherent latency of belatedness — the inability of the trauma victim to grasp and assimilate the traumatic existence in real time"[5] - just like the "latent" electrostatic image in Xerox copying machines, and the phenomenon of magnetic remanence. Latency, here, correlates with the neurological notion of "implicit memory" where contents are not available to consciousness.

In technical terms of digital calculation, the delay is inherent in the notion of "real (signal processing) time" already - different from the time-indexical "live" signal transmission. Trauma studies often lack a close reading of the technologies implied.[6] For an analysis of both modes of generating presence, such studies require to be correlated with the media-archaeological approach which identifies technology-induced traumatic tempor(e)alities respectively memories, in order to work out their affinities and differences to the familiar traumata caused by historic war, genocide or terrorism experience.

Disruptions of the present preserved by and generated from within technological media

The "present", has for long posed a challenge to scientific analysis which ultimately could not be achieved by cognitive reasoning alone but only be captured with technological and time-critical instruments, combined with a number of approaches and methods from a variety of fields such as neuro studies and Digital Humanities bridge humanities and the sciences.

Faced with the difficulty of recording ephemeral cultural articulations themselves, brilliant insights like G. W. F. Hegel's definition of the tone as transitive being resembling the inner self remained pure philosophy. But media archaeology (in terms of technological measuring of a sound as event) allows to ground such an epistemological spark in the technical event itself. With the emergence of signal recording media like photography, phonograph, cinematography, magnetic tape and finally digital recording, however,

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5 Mati Shemoelof, RealityTrauma Alienated Past and Alienated Present: On the Engagement with Nightmarish Light, in: Avi Ganor, RealityTrauma, exhibition catalogue Tel Aviv Museum of Modern Art, 2011, 175-203 (203); reference kindly provided by Marcus Bastos (October 2016)

6 See Cathy Caruth, Unclaimed Experience. Trauma, narrative and History, Baltimore (Johns Hopkins UP) 1996

technical media allow for capturing the present, resulting in an unforeseen disposal of tempor(e)alities. Such media-induced time shiftings and time axis manipulations - while apparently smoothly integrated into everyday cultural practices - still are an affective shock which the cultural unconscious has not yet fully digested.

"Archiving" the present is understood here not in the passive sense of accumulating signals or data in a structured way, but rather in Foucauldean and Derridean terms as a generating principle (*archive* / *arché*). Different from what Gumbrecht more recently called "production of presence"[7], the focus is on technological abilities to generate fuzzy *presents*. The terminologial effort of *smeared present* is deliberately close to the concept of *fuzzy logic* in computing science.

Psychological presence effects for players of computer games emerge in moments of suspense of self-consciousness. The expression "for the present" (which equals *einstweilig* in German) reminds of Husserl's conceptual protention[8], while retention is "the process by which an awareness of 'now' is synthesized with previous instants held momentarily in consciousness to yield a sense of temporal unity and flow."[9] The sonic equivalent to this state of extended consciousness of the present is acoustic reverberation; any damped oscillation slowly fades away. It is exactly at that point that vacuum-tube based electronic developed the circuit which produces undamped, sustained oscillations as basis for, e. g., radio transmission or synthesizer tones. While the very retentive experience of presence in phenomenology creates the impression of a "living" present exactly because it tends to death (a Heideggerean "being-to-death"), the electronic loudspeaker-based acoustic presence is a timeless present.

The administrative *arché* and the traditional "archive" (the symbolic order as operated in the textual record) has been technologically challenged by non-alphabetical media recordings (starting with photography and the phonograph), allowing for not simply "archiving" presence in the symbolical mode, but to re-store presence to the affective, signal-based level of perception.

Here the tempor(e)alty of affect is now being matched by micro-technical moments of intermediary storage.[10]

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7 See Hans Ulrich Gumbrecht, Production of Presence. What meaning Cannot Convey, Stanford, Calif. (Stanfort UP) 2004

8 See Don Ihde, Listening and Voice. Phenomenologies of Sound [*1976], Albany, NY (State University of New York) 2007, chap. 7 "Timeful Sound", esp. 89 ff. (referring to an earlier translation of Edmund Husserl's *The Phenomenology of Internal Time Consciousness* by James Churchill, Bloomington, Ind. (Indiana University Press) 1964

9 Joseph Clarke, For a History of Liveness, in the architectural journal: log, vol. 33 (2015, forthcoming), 25-37 (35), referring to: Edmund Husserl, Phenomenology of Internal Time-Consciousness [GO *1928], Bloomington (Indiana University Press) 1964, 52–53, §12

10 See Peter Hartocollis, Time and timelessness, or The Varieties of Temporal Experience (A Psychoanalytic Inquiry), New York

The different ways of storage thus results in different ways of re-storing presence both in individual and collective "memory".
In digitaql media, finally (so far), the symbolic regime and signal recording converge: the alphanumeric code, algorithmically processed in hardware-based signal processing (DSP).

Due to the formerly evanescent nature of its object, the study of presence has become inseparable from the study of its archiving media. A number of influential studies have already explored the way in which recording media have molded our perception of presence (e. g. Kittler); analogue signal-recording media and recently signal-processing (DSP chip based) media have enhanced the power of generating the affective experience of presence. Recording technology made it possible for the first time to store, repeat, and manipulate presence. An escaping moment (the physical signal) now became an object of communication analysis that could be replicated and analyzed.

Different from alphabetically coded memory of the past, signal storage media can immeidately re-create the affect of presence in human temporal sensation. What is cognitively know as belonging to the past (the familiar "historical" record) is phenomenologically perceived as affect of presence, resulting in a cognitive/affective gap which has not yet been reconciliated.

While recent research has discovered that the specific phonetic alphabet which is still in current use today has been invented to record, store and transmit the musicality of Homer's oral poetry, a different kind of alphabet - the digital code - nowadays dominates most processing of cultural communication. The conversion of analogue to digital media archives is not just another mode of cultural memory but a dramatic transformation of its essence. Algorithmic re-presencing needs to be thoroughly reflected by both media and cultural theory.

There are chrono-traumatic irritations of the sense of the present caused by signal recording and data processing technologies. The symbolical or technical inscription of traumatic experience ("archiving presence" and "re-presencing the past") is not only bound to specific historical situations, but rather much deeper rooted within the techno-epistemology of media themselves.

Psychological symptoms like being "out of sync" indicate a micro-temporal irritation; the Lacanean "real" invades the symbolic order as tempo*real* (German *Zeitreal*).

THE TEMPOR(E)AL IN THE CINEMATOGRAPHIC APPARATUS

"The indexicality of the cinematic sign appears as the guarantee of its status a record of a temporality outside itself <...> which would not be that of its own functioning. This is what imbues cinematic time with historicity."[11] But different

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(International Universities Press) 1983, chap. V "Time as a Dimension of Affects", 59-78

11 Mary Ann Doane, The Emergence of Cinematic Time. Modernity,

from "analog", time-continuous signal recording, cinematography does not record a continuous tempor(e)ality outside itself, but in fact *spatializes* it - a linear, but not steady but interrupted geometrization and thereby mathematization in terms of Bergson's critique of the moving image <see Doane 2002: 66>. With each discrete photographic frame which is in fact *stilled* during recording and projection by the intermittant mechanism of the apparatus, a sampling of the present takes place which is insteant archiving. "Once the present as contingency has been seized and stored, it ineluctably becomes the past."[12]

This translation into the chrono-symbolic order equals the cinematographic recording with the written document: In the moment of reading / viewing "it becomes the experience of presence" <Doane ibid.>, as long as the physiological persistence of vision and the phsychological phy phenomenon result in the virtual impression of continuous motion. Such a repetition of the present moment, though, fundamentally differs from electronic "live" transmission of visual signals. In terms of informational entropy, such a re-viewed present is redundant: "The act of filming transforms the contingent" - which is no finite alphabet on the source side - into a discrete series (time-string) of visual characters, "reducing its contingency" <Doane ibid.> - unless the sampling theoreme in the mathematical sense of communication engineering is being applied. The act of cinematographic recording is not historicizing but quantizing. Against the prevailing notion of "the archive's historicizing impulse" <Doane 2002: 30>, the techno-archival operation asks to be decoupled from its tight alliance and absoption with the historical discourse. "The cinema engages multiple temporalities" <Doane 2002: 30> - which is not only the narrative diegesis, but first of all (in the media-archaeologial interpretation) the chrono-mechanism of the technical apparatus itself. The instant recording which takes place in cinematography is "archiving the present" indeed, but the historicistic interpretation of this act ("cinema transforms the present into immediate history"[13]) does not refer strictly to what the apparatus does. The "historicizing" quality only works when the technical analysis is coupled with contextual, that is: media-external narratives.[14]

Can the cinematograpic experience be "historicized" (in Freud's and Lacan's sense) and thus be integrated into historical discourse, or does the shock of its oxymoronic power of re-presencing (the dead, the passed) remain a traumatic momentum, that is: not entering conscious symbolical mastering? Has the shock of the first "movie" screening in Paris 1895 been digested in the cultural unconscious at all, or does it insist as a sub-cultural irritation? "As soon as one is aware that a film can be viewed again - that this experience of presence can be repeated - it becomes a record [...]."[15] But "[i]t would be more accurate to say that photography and the cinema produce the sense of a present moment laden with historicity at the same time that they encourage a belief in our

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Contingency, the Archive, Cambridge, Mass. (Harvard Univ. Press) 2002, 23

12 Doane 2002: 23

13 Doane 2002: 105

14 Only "the spectator's historical knowledge inevitable makes the event 'historical'": Doane 2002, note 79

15 Doane 2002: 104

access to pure presence, instantaneity."[16]

Any cinematographic projection derives from a storage medium (phonotgraphic image series on celluloid). But the professional shooting of a cinematographic sequence is a form of repetitive presence itself: camera shots as intervals which mostly require repetitive shooting ("takes"). Still every "take" - even for the most narrative "fiction film" - is a time-authentic recording, since it is unique in its individual nuances.

"Sampling" the visual present (self-recursive images, thumbnail movies, kinematographical projection)

begin modMEDZEIT-AFFEKT-IRRITAT / There are in fact different classes of the temporal *inbetween*: the Dirac-impulse (the momentary interruption - approaching the ideal time-criticality of the "real") and the switching time between binary states (defined by Norbert Wiener as "time of non-reality"[17]) which only counts when the speed of calculation approaches the real-time window of presence. For re-presencing the past, an empty signifier is required. But how the represent a void without turning it immediately, and by the very process of signification, into a presentation, i. e. a mark of presence? Mathematically, the cipher (which means literally) *zero* is to fulfill this function; on my keyboard, it is the key for *blanc* which performs this (which, in digital terms, is nothing but a – positive – bit as well, indifferent to other ciphers or letters or ASCII signs). Maybe the only way out is to quit the semiotic realm, not talking about signs any more, but reconsidering signs as signals, i. e. as very physical impulses – the very flow and energy of internet (as) information. Neither the local inbetween - the *spatium* - nor the arithmetic symbol "zero" is simply nothing; suspension (German / Hegelian "Aufhebung") is the temporal correlate to these terms.

The phenakistiscope discs provide a real animation device, presented to the public by Joseph Plateau in 1833. "The artist(s) only had 8 to 12 frames to work with and these had to form a loop. The results are quite compelling and surprisingly fluent, although many movements are incorrect [...] more than 40 years before Muybridge started his photographic motion studies."[18]

But this for-running of cinematography proper does not extend to archaeological dimensions, as indicated by an ancient Oriental ceramics decoration depicting a chrono-photographical sequence of movement states.[19]

Is this "animated" image sequence the starting of the "moving image" for media history? In his classic "archaelogy of the cinema" C. W. Ceram puts the

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16 Doane 2002: 104

17 See Claus Pias, Time of Non-Reality. Miszellen zum Thema Zeit und Auflösung, in: Axel Volmar (ed.), Zeitkritische Medien, Berlin (Kulturverlag Kadmos) 2009, 267-279

18 McLeans Optical Illusions: http://www.youtube.com/watch?v=3JeN3uk2ClE

19 See http://www.youtube.com/watch?v=IpAFmuSehRg
http://www.cais-soas.com/CAIS/Art/porada/porada-akkad.htm

prehistory of the motion pictures straight: neither the baroque automata and marionette theatres led to genuine moving picture sequences.

When tracing such perceptual shocks of "cinematography" *avant la lettre* backwards, another flash-back leads to an archaeological scene proper. An irritation of the visual immediacy of the present can happen within one image scene itself (as known from psychological experimentation):

But the search for early identification and re-tracing the "moving image" is already trapped by the historical discourse with its obession for origins. The flipbook, for example, is not a media-historical improvement of this animation scenario from the Middle Eastern Bronze Age; the relation is rather prehistoric in a structural, that is: media-archaeological sense.

The very term media archaeology does not only root (*arché*) in Foucault's seminal method of knowledge analysis but has been related to media in the context of moving images technologies "first".

Media archaeological analysis has developed a special sense of discontinuities, ruptures, thresholds, limits and series.[20] Such non-narrative shapes of time can be located and re(oc)cur within the cinematographic apparatus itself: dis/continuity (with the slash signifying the kinematographic cut itself) is the very essence of the mechanical movie apparatus, of its dialectic of movement and stillness, halting the single frames of the continuous celluloid reel for a moment in order to evoke the physiological after-image and neuronal image-blending within the observer.

The transitoriness of human perception of a landscape passing by (out of a train window as *dispositif*) differs from the filmic registration and projection of the same scene, as expressed in Haiko Daxl's video installation *Le Cinéma – Le Train*: "Film leads and film takes of railways are the raw footage of this work. By manipulation and montage in relation to the musical composition there are points for thoughtful excursions, roundabouts, dreams, curves, imaginations and lost memories."[21]

As long as human perception was not yet media-culturally *trained* and accellerated and finally used to rapid kinematographic image sequences (both on the single frame projection level and the filmic montage), it could not distinguish the discrete elements passing by. Indeed, Walter Benjamin insisted on the historicity of human sensation - which is, among others, a function of its technological conditions.

As notoriously expressed by the writer Victor Hugo in 1837, a journey for the first generation using trains for transport was not yet prepared for kinematographic perception; in fact *still* photography was about to be invented:

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20 See the "Introduction" to Michel Foucault, The Archaeology of Knowledge [FO 1969], London (Tavistock) / New York (Routledge) 1972 http://www.marxists.org/reference/subject/philosophy/works/fr/foucault.html

21 Video commentary in the exhibition catalogue *Media-Scape* (the Biennal for Time-Based Arts), Zagreb, September / October 2012, edited by Ingeborg Fülepp, 25

“The flowers are not flowers anymore, but spots of colour, or better to say red and white stripes. There is no point, everything turns into stripes. Cornfields like long yellow strands of hair and meadows like long green plaits. Church towers and trees start to dance and merge in a lunatic way with the horizon. Sometimes a shadow appears, a ghost (...) and disappears like a flash."

This brings back the cinematographic affect which in its media-and-sensuality-archaeological ground is a deceiving of the human eye which perceives stimuli which pass bye in rapid succession as continuous, we learn from Beranek's article on "Die Irridations-Erscheinungen" in the journal *Filmtechnik* from 1926.[22] This is even more subliminally true for digital images. A certain *irritation* of presence by the technical manipulatiuon of optical human perception of movement is based, among others, on the physiological phenomenon of *irridation* <Beranek xxx: 225>. This refers to the core procedure of kine-mechanics - not in its sense of creating an illusion of figurative movement, but as structural kinematography in sensational physiology. "Irridation" and "irritation" here merge on the micro-traumatic level of sensation. Irridation even happens with the unmoved image, thus: moving the still[23] - which induces micro-temporal techno-neurosis. Irritations of presence here merge with irridation: a flimmering present. There are irritations of "presence" which do not become conscious (cognitive time perception) but are subliminally at work. The psychologist E. R. Clay identified an always already deferred *now*:

"The present to which the datum" - the *Datum* being a term used by Immanuel Kant for sensual impressions - "refers is really a part of the past - a recent past - delusively given as being a time that intervenes between the past and the future. Let is be named the specious <= "täuschend", "blendend" - im Falle kinematischer optischer Medien buchstäblich> present, and let the past, that is given by being the past, be known as the obvious past."[24]

Temporal delay is true for optical perception already: The human eye perceives light (and colour) as a bandwidth interval in the spectrum of electro-magnetic waves which are by definition limited by the speed of light, thus: minimally deferred.

Theodor W. Adorno remembers an acoustic scenario where he once was able to compare his actual listening to a nightingale through the open window with the radio transmission of the same bird:

"[...] and the author [...] managed to listen to it over the radio when the windows were open. The result was that we were able to hear the radio nightingale a bit earlier than we could hear the real voice because sound takes longer to reach the ear ordinarily through space than by electrical waves. The

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22 Rudolf Beranek, Die Irridations-Erscheinungen, in: Filmtechnik vol. 2 (1926), 44f; reprinted in: Kümmel / Löffler (eds.) 2002, 225-228 (225)

23 Beranek 1926/2002: 226

24 E. R. Clay, The Alternative. A Study in Psychology, London 1882, 167

real nightingale sounded like an echo of the broadcast one. Thus the 'radio voice' creates a strong feeling of immediate presence. It may make the radio event appear even more present than the live event"[25]

Irritations of the present may be "technologically induced" in a two-fold methodic and electro-technical sense: Faraday's 1830 "inductive" (experimental, "hands-on") identification of the electro-magnetic induction; Maxwell's mathematical analysis of this effects which leads him to the conclusion that there is isomorphy between the behaviour of electro-magnetic induction and speed of light; finally Hertz' experimental verification (unexpectedly resulting in: "radio").

Technically, this became electronic with Vladimir Zworykin's Iconoscope (1923) where the image through the lense is projected upon a mosaic plate of glimmer, to be scanned by a cathode ray beam in order for the emitted electrons to be amplified. This leads to what Wolfgang Hagen calls the "third image": an invisible image consisting of electrons as intermediary storage.[26]

ARCHIVING THE PRESENT. Irritations of Presence by human and non-human micro-storage events

Auratic presence and the aesthetics of "live"

Where does "live" stop and "delayspace"[27] start?

The destruction of the work's of art "aura" by technical reproduction (Walter Benjamin) is foremost an instrusion into its temporal structure; "aura" is bound to its specific (almost Bergsonean) time figure, between the temporal now ("the present") and auratic appearance ("presence" and "re-presencing")

Technologies of communication are analogous to "those phenomena and conditions that contribute to the production of meaning, without being meanings themselves"[28] - the Kantean *a priori* transformed into a processual element, plausible for the technological production of presence.

It has been a feed-backward effect of recording technologies that made it possible to perceive existing events as "live".[29] The tele-presence induced by electronic images in television news is different from the most determining

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25 Theodor W. Adorno, Current of Music. Elements of a Radio Theory [1940], ed. Robert Hullot-Kentor, Frankfurt/M. (Suhrkamp) 2006, chap. V "Time - Radio and Phonograph", 120-128 (120)

26 Wolfgang Hagen, Das dritte Bild. Kontingenzen und Zäsuren in der Technikgeschichte des Fernsehens (2003, lecture University of Basel); see http://whagen.de/main.php

27 A term coined by Marcus Bastos for his media theatrical performance 2014; http://www.eventualidades.net/delayscapes

28 Gumbrecht 2004: 8

29 Philip Auslander, Liveness. Performance in a Mediatized Culture, 2nd ed., London (Routledge) 2008, 56

auratic characteristic of the museum: "the necessary presence within it of objects, things which by their presence in the museum, claim a particular status [...]"[30] - in fact the status of real presence.[31]

But image transmission by the digital camera is not really telepresence any more. The recursive loop between technically mediatized art and "live" art is known from closed-circuit video installations already.

Motion analysis and the "time-window" of presence in neurological terms

"Archiving presence" opens a temporal window of affective indeterminacy, "a zone between a 'not yet' and 'always already over'"[32]. In neurological terms, the brain does not store memory images or acoustic melodies respectively rhythms as such but rather operates with *Delta* codification: just the differences between waves are registered.

It is by intervention of measuring equipment like digital motion capturing that what appears like expressions of a continuous present dissolves ("analysis") into micro-intervals of quasi-musical motions. What looks and sounds like a transitive relation between a musician and his instrument, might not be a musical gesture at all but rather a "servo-mechanism" in cybernetic terms of signal communication between the animal and the machine.

Intermezzo: "live" transmission in radio and television

On a macro-temporal level of vehicle transport sensation, the inter-continental travelling experience of so-called jet-lag = delayed, "deferred present", differential time experience (where time is experienced *transitively* while emerging: as transition), an irritation of the present literally *on the fly*.

On the micro-temporal level of tele-communicative signal transmission, "live" transmission is never immediate in its strict electro-physical sense. On the level of electro-magnetic waves, there is always a delay at work - the limit of the speed of light itself, as discovered by J. C. Maxwell in response to Michael Faraday's "invention" of the electro-magnetic induction effect.

Electro-magnetic induction itself is already a microphysical oscillation between delay and transfer. Martin Heidegger's notion of "ecstatic" temporality (*Being and time*, 1927) differs from time as succession, like the momentary event of the soccer goal transmitted in live television.[33] Here, the "Augenblick"

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30 Silverstone 1992: 35

31 See George Steiner, George Steiner, Von realer Gegenwart. Hat unser Sprechen Inhalt?, Munich 1990

32 As expressed in the *abstract* for the symposium *Timing of Affect*, Academy of Media Arts, Cologne, 30 May - 1 June 2013

33 See Paddy Scannell, Television and the Meaning of Life,

corresponds with the ecstatic "now".[34] Is this "realtime history" like Günter Schabowski's immediate (electro-phyiscally real) transmission of the (symbolic) "sofort"?

"Beckham's goal <sc. during the World Cup in Germany 2006 ?> is a perfect example of the relationship between events and their moments. <...> The goal, when it came, struck like a flash of lightning. There and gone in an instant. And yet everything was now transformed - an electrifying moment [...]"[35]

- *electrifying* in a media-literal sense, since: "The aliveness of tele-technologies is the effect of the power (energy) source that is the condition of their possibility; namenly electriity" <Scannell 2014: 48>. This is the Kantean and Foucault's *a priori* in times of technical signal transmission media.

cMEDZEIT-AFFEKT-IRRITAT / This reminds of Walter Benjamin's *Theses on the Notion of History*, according to which dialectic history "flashes" like an images to be seen never again - indirectly a description of the electronic image. Just like phonographic signal recording, video transmission and recording can not but register even stillness as "moving" which is the physical nature of the time-signal and the rotating or scanning apparatus itself, performing a mathematical "integration" of the recorded movement. But Benjamin wrote this before video tape recording from television arrived; in fact since 1963 videotape machines (just like the subsequent video-disc) allowed for the *instant replay* of decisive moments in sporting events. The instant, once the temporal icon of pure present, became iterative; extended (or rather: distanced) presence by signal recording in fact transforms delay into archive. At the moment of the catastrophe seconds after launching the Challenger space shuttle in the US,

"[...] television itself was on the scene - witness to the catastrophe. And the played and replayed image of the *Challenger* exploding [...] constant evidence of television´s compulsion to repeat - acts as a reminder not only of the catastrophic nature of the event but also of the capacity of television to record instantaneously, a reminder of the fact that television was *there*. The temporality of catastrophe is that of the instant."[36]]

The irritation of the present by electronic media operates in the hidden mode; only subconsciously humans register micro-moments of delay which leads to subliminal irritations of sensation. This temporal secrecy erupts in telecommunicative moments when the live transmission of a soccer game on television is paralleled with its live report over radio where the latter is usually faster in signal transfer. When the ear has pre-processed the information already, it is easier for the eyes-coupled brain to process the visual immediacy of the event culinating in the dramatic soccer goal.

The scripted talk in radio and television was introduced against the risks of

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Cambridge (Polity) 2014, 173 ff.
34 Scannell 2014: 188
35 Scannell 2014: 173
36 Doane 1990: 231 f.

unsheltered unscripted commentary in live transmission and "breaking news".[37] Different from cinema-montage which allows for dramatical time order since it is a storage medium, electronic (signal-based media) coincide with the experience of contingency. René Thom's "theory of catastrophy" corresponds with the character of "breaking news" in television. The significance of the electronic media event is in its temporal immediacy, "where the referent becomes indissociable from the medium"[38] - signal transmission; recent German history when at a press conference on November 9th, 1989, the GDR speaker of the central government committee, Günter Schabowski, announced the "sofort" implementation of the new liberal travel licence for East Germans. Since this "sofort" spoken at an East Berlin press conference was technically transmitted "sofort" (immediatley) as a live signal by television and radio, it triggered the break of the Berlin Wall since it was faster than any political or military administration could react in real time.

cALGORITHM-ETHICS-PRESNER / The traumatic momentum is not restricted to referential "historical" incidences like the "nine-eleven" terrorist attack on New York in 2001 as televisual witnessing, but actually already results from the micro-shocks which is technologically induced in human media perception (See Doane 2002: 13 ff).

One effect of digital cinema, video and sound is that the "witnessing" on its most essential technological level looses its indexicality.

modMED-STOERUNG / Until recently, radios's and television´s, and nowaday's mobile media "greatest technological success has been its ability to be there - both at home and ubiquous. "Hence the most catastrophic of technologocial catastrophes is the loss of the signal"[39].

The oppositite is Hiroshi Sugimoto's classic long-time photographic exposure of the classic cinema theatre screens when finally all the projected images merge into one bright light - "an extreme condensation of time."[40]

Henri Bergson criticized cinematic and mathematical clock time which samples duration (the true essence of time) into measurable, spatial slices. The geometrization of time is the message of digital culture itself with its sampling techniques and mapping of time into topological storage and data processings. Temp*aurality* here, does not endure any more."Benjamin might say that the loss of aura associated with electronic reproduction is a function of its inability to *endure*."[41]

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37 Scannell 2014: 114

38 Mary Ann Doane, Information, Crisis, Catastrophe, in: Patricia Mellencamp (ed.), Logics of Television. Essays in cultural criticism, Bloomington / Indianapolis (Indiana UP) 1990, 222-239 (222)

39 Doane 1990: 238

40 Mary Ann Doane, Has Time Become Space?, in: Liv Hausken (ed.), Thinking Media Aesthetics. Media Studies, Film Studies and the Arts, Frankfurt/M. et al. (Peter Lang) 2013, 89-108 (90)

41 Doane 1990: 227

Instantly recording the present

Against the user claim for immediately fetching all kind of data, restricted access has been an old archival virtue of temporal defer to be rediscovered - with a view on the essence of academic university as well. Online access to data results in a culture of “immediacy, whereas traditional (academic) knowledge require delay in reflective thinking.[42]

There has been a remarkable media-technologically induced difference between the situation of people waiting at St. Peter's Cathedral in Rome for the new pope to be announced in 2005 (Benedict XVI) and in 2013 (Francesco)[43], from continuous eye-witnessing of the present moment to time-discreet "I-(pad-augmented)witnessing". Virtual photo-testimony is a kind of macro-sampling of the present (which micro-technologically happens in the sample-and-hold mechanism of analog-to-digital conversion itself).

Different from the archive which is symbolical order, recorded by symbols (alphabet), thus: spatial orders, audio-visual media record signals which are physically functions of time; this becomes apparent in, e. g., Gordon Bell's *My Life Project* recording project, operated by the permanently worn data eye-glass. When these are being re-played, our senses are affected, in a non-historical way. There is no memory here, presence happens, like any electronic re-play is dynamic. Instead of psychoanalytic trauma-research now: an analysis of the techno-traumatic momentum (traumatic irritations of re-presencing induced by analog and digital techologies, such as the phonograph once and the real-time, that is: techno-archival present in Web 2.0 cache memories of short-time data buffers and registers.

Duration is the conceptual contrast, as defined in Henri Bergson's *Creative Evolution*: "There is [...] no stuff more resistant nor more substantial. For our duration is not merely one instant replacing another; it it were, there would never be anything but the present [...]. [...] Memory [...] is not a faculty of [...] inscribing them [sc. recollections] in a register." There is no register, different from stored-program computing (the familiar von-Neuman architecture) where the register figures centrally within the CPU to operate at all.

Another case is Finnish media-arist Erkki Kurenniemi's audio-visual self-recordings over decades, from analog to digital devices.[44]

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42 Marquard Smith, Theses on the Philosophy of History: The Work of Research in the Age of Digital Searchability and Distributability, in: Journal of Visual Culture 2013 12: 375-403 (380)

43 An argument by Angela Maiello (PhD student, University of Palermo), research presentation at the colloquium *Medien, die wir meinen*, Humboldt University Berlin, summer 2013

44 See W. E., E-Kurenniemics: Becoming Archive in Electronic Devices, in: Joasia Krysa / Jussi Parikka (eds.), Writing and Unwriting (Media) Art History. Erkki Kurenniemi in 2048, Cambridge, Mass. (MIT Press) 2014, 203-212

"We would make a mistake if we think that, in contrast to Erkki's attitude towards presence, we could refer to a 'normal' sense of presence in the present: to an unmediated, integral presence. Nothing as such exists either. We are always anticipating and deferring, missing the presence. But if we all 'live with it', Erkki has articulated his life around it and explored the full consequences of the utopia of a divisible present in both existential and technological terms. Films, images and videos, here, are time capsules. But not of any time, but the time of a deferred, diminished presence. To begin an archive based on documents of such a nature means first to negotiate a debt. An archive would need to give back the presence that Erkki took away from his life moment by moment."[45]

cARC-TIME-CTM / The new immediacy of archival time in terms of *online* accessability and instant re-play may be compared to a situation from the area of visual recording of movement. The production and projection of documentary film since the beginnings of cinematography had been a rather heavy and slow apparatus-depended process, and copies were expensive. Around 1968, with the arrival of the first Sony "portapacs" as portable video recorders (used, e. g., by Nam June Paik), "meant a breakthrough, because you could immediately play back what you had recorded."[46]

Archives have always been summoned "to give back time" - which requires that they first withdraw data from the temporal economy of the present (as represented in the practice of immediate access on the Internet). "But what if they are asked to give back presence?" <Constant ibid.>.

Erkki Kurennimi's self-recording (which has been pornographic to some extent) lingers at the borderline between the obsession of memoryless consumtion of presence and the pleasures of its immediate recording.

On Douglas Rushkoff, *Present Shock*

Technological control over time becomes universal in turingmachine time.

"[N]o matter how precisely we can count our milliseconds, neither our bodies nor our businesses are proving as programmable as our computers. [...] While our technologies may be evolving as fast as we can imagine new ones, we humans and our culture evolved over millennia and are slower to adapt. The body is based on hundreds, perhaps thousands, of different clocks, syncing to everything from the sun and moon to levels of violence and available water. We can't simply declare noon to be midnight and expect our body to conform to the new scheme as if it were a Google Calendar resetting to a new time zone. Neither can we force our businesses to conform to an always-on ethos when the people we work with and for are still obeying a more deeply embedded

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45 Constant, Erkki Kurenniemi (In 2048) (preliminary work towards) an online archive; *online* http://kurenniemi.activearchives.org

46 Tjebbe van Tijen, We no longer collect the Carrier but the Information, interviewed by Geert Lovink, in: MediaMatic 8#1

temporal scheme."[47]

Communicational connectivity of being always-on is an affordance of electronic media. But only when combined with mathematical intelligence, the punctual present explodes into the multitude of real-times.

Rushkoff defines presentism as a result of the pervasiveness of digital technology where everything is "now", but the very term *now* still continues a metaphysical concept of the present. What really puts the term into quotation marks is real-time signal processing which in fact achieves a dissimulation of the "now" itself.

"Each moment is a new decision point more than it is part of some journey through time. In digital media, we are participating in a real-time event, not being taken along some linear path."[48] What articulates itself through Rushkoff's *persona* is the message of hypertextual Internet communication topology itself.

The present condition, as analyzed by Rushkoff, has become con-temporary in its literal sense: living in real-times, communicating instantaneously, co-existing simultaneously, being always-on, in post linear time - even timeless.

At the same time, the computational condition of data-processing in the present is de-archiving: moving programs and data from the hard drive to the Random Access Memory. Random access to intermediary storage devices is a mode of fuzzy present as opposed to the Read Only Memory frame of the conventional nation-state.

Rushkoff defines the "present shock" as "a kind of timelessness. We are becoming an a-historical society, with no sense of story, [...]. We're going from a world where we find meaning over time to one where we do it in the moment. It's a digital society, where everything is a sample or a duration."[49] Is culture prepared for digesting this tempo-real irritation of its traditional symbolic time order, or will it results in an ongoing traumatic disorder of times out of joint? "[...] we begin with some wobble — the kinds of initial reactions to a presentist, real-time world. But slowly, over time, we become more mature in our ability to deal with this new temporal environment" <ibid.>.

Between storage and interaction with the present: Time-critical signal

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47 Adapted from Douglas Rushkoff, Present Shock. When Everything Happens Now, New York (Penguin) 2013; http://www.rushkoff.com/blog/2013/3/14/wall-street-journal-adaptation-from-present-shock.html; accessed November 4, 2013

48 Rushkoff, in: Andrea Huspeni, "For Douglas Rushkoff the future is now — and that's the problem", edited and condensed interview, March 21, 2013, in: PandoDaily; http://pandodaily.com/2013/03/21/embargo-321-how-present-shock-is-shaking-up-the-startup-world; accessed November 4, 2013

49 Rushkoff, in: Huspeni 2013

manipulation of presence (magnetic tape, video recording)

The philosophical (Bergson) or historical (Braudel, Koselleck) notion of temporal layers becomes firmly grounded[50] in magnet tape recording (sound, video, data storage).[51] In World War Two, the allied armies had been puzzled by apparent live converts transmitted by German radio in the middle of the night - which in fact was time-shifted radio broadcasting from Berlin, due to magnetophonic recording in high signal fidelity which resulted in the phenomenology of "live" hearing. Only a close reading of a specific technological operation - the ultra-frequency pre-magnetisation of the tape immediately before the recording head - explains for this tempo*real* irritation of human perception of the present. Soon after German capitulation, US army officer Jack Mullin introduced two such magnetophones to AMPEX company. At the East coast, Bing Crosby's radio studio production had to master the problem of time zones for broadcasting in USA; the solution was either repeated "live" broadcasting for different times zones (while the speed of electro-magnetic waves in broadcasting remains the same), or pre-recorded production which can then be at temporal random be re-played in different times (the reverse of Random Access Memory in computing). The magnetophone allowed for the "live" recording of the present event, then for time-shifted re-play - undoing the linear time line, while not undoing the "time object" of the technical device itself. In mass media production, this has resulted in a chrono-technical hybrid: so-called "live-on-tape".

A generation before, John Logie Baird had invented "Phonovision" for recording his electro-mechanically produced television signals on grammophone discs, while German television developed the intermediary film procedure ("Zwischenfilmverfahren") for broadcasting the Olympic games in Berlin almost in the live mode: In order to capture events in daylight, only celluloid recording was sufficiently sensitive (therefore not allowing for immediate actual news broadcasting); such film sequences were not meant for post-production or archiving but developed immediately after the event to be coupled with an electronic camera in the television automobile - with the photo-chemical emulsion being washed out immediately after for re-filming. This is the reverse of *kinescope recording* directly from monitor on 16mm film for storing electroic images before video tape technology.

The video recorder in private usage resulted in a "transition from unidirectional time flow (from present to future) to multidirectional time flow"[52], brought to its technical point with the *start-over button*. "As long as a particular program is being broadcast, it is possible to start it over again", thus echoing synchronic

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50 *Erdung* is a technical term in German electro-engineering, giving a precise sense to media-archaeological analysis. *Grounding* indicates that circuits in hardware - the "mass" - have to be connected with the ground, just like the antenna in ancient radios to avoid a lightning strike destroying the whole apparatus.

51 See Friedrich Engell / Gerhard Kuper / Frank Bell, Zeitschichten. Magnetbandtechnik als Kulturträger, Potsdam 2008

52 Mira Moshe, Media Time Squeezing: The Privatization of the Media Time Sphere, in: Television & New Media 13(1), 2012, 68-86 (74)

and asynchroni broadcasting schedules.[53] Such is time axis manipulation in analog video cassette recording. "To rewind means to reverse the direction of a roll of magnetic tape or various types of film. This term has outlived" - in a kind of technosemantic gap - "physical spool-based media and is now also applied to digital media" <ibid.>. What would media-based autobiographical re-collection as dramatized in Samuel Beckett's *Krapp's Last Tape* look like today?

Today, digital video recording is an almost dialectic interlacing of cinematography on celluloid and electronic live image transmission:

"In the convergence between a repetition and a renewal lies the tendency to archive while bringing forward: past and present instantly simultaneous in the fragmented image. While it loops the past, the digital creates an image of an archival strategy where time passed becomes constantly accessible for the future. [...] reality's duration seems to have become a continuous stream of information potentially open for another time."[54]

Digital recording does not require the delay time of chemically "developing" the negative on celluloid any more but renders immediate monitoring functions. Different from the well-acquainted monitor function known from video camera recording and live television, the digital moving image recording allows for immediate intervention. "[D]igital equipment has been built on this ability of storing information efficiently for the purpose of immediate and direct access to, and interaction with, it. What is stored on a hard drive are data that can be retrieved via a number of points or routes as made possible by the RAM"[55], governed by the agency of the operative algorithm and resulting in an algorhythmicized (Miyazaki) present.

Archival manipulation of the already present: Real-time editing

Visible Cities, created in 2009, is a webdocumentary and multi-screen installation, developed by the LAT-23 collective in Sao Paolo, Brazil.[56] "The online version generates automatic clips of 8 minutes, by randomly mixing pre-recorded and live footage from webcams organized in sets of pre-defined tags and listed on the project's database. The installation version fill a darkened room with 5 monitors that display the live cameras, organized according to a collection of tags periodically sorted. The premise is that intermittent images of a place result in a situation opposite to the one to be expected."[57] The automatic editing process creates films that evolve in real-time from algorithmic decisions:

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53 Moshe 2012: 74

54 Markos Hadjioannou, From Light to Byte. Toward an Ethics of Digital Cinema, Minneapolis (Univ. of Minnesota Pr.) 2012, 174

55 Hadjioannou 2012: 201

56 Denise Agassi, Marcus Bastos, Claudio Bueno and Nacho Durán

57 Marcus Bastos, Eventuality: Designing Real Time. Lecture Notes, in: Computer Society (Proceedings of Human Interaction 2014 Conference), Heidelberg (Springer), 2014

"Visible Cities aims to subvert the logic of filming and editing typical of cinema and video, with procedures of capturing online signals and tagging the resulting materials. The goal is to produce films in which live footage produce unexpected results. It is impossible to anticipate what the online webcams embedded on the project's database will display. By aproximating them by a combination of tagging and spatial proximity, the piece stimulates arbitrary relationships between distant places."[58]

The footage is already existing, but the spatial relations and order in which it will be displayed is generated every time the user clicks on the play button. Like George Legrady's installation *Pockets full of Memories*, this kind of Self-Organizing Map relates to genuine computer art which is generative aesthetics (Max Bense et al.). When the images are edited through programming rules, the algorithmic collage replaces narrative dramatization.

Between analog and digital (non-)temporality: the photographic snap shot as temp"aural" moment

The term photography itself has become antiquated in the digital age, where the analogue "writing of light" (records) has been replaced by numerical "computing" of photonic energy transduced to binary information. While photo-*graphy* technically fulfills Derrida's criterium of the belatedness ("*différance*") of (hand-)writing[59], digital photography rather belongs to the Gutenberg Galaxy (McLuhan) of typography.

The notion of "space" itself derives from Latin *spatium* which names the interval. This can be of geometrical or temporal extension and in room acoustics is a function of the signal run time difference. With the shrinking of the temporal interval of processing a photographic negative in digital instantaneity, the sense of history is indirectly affected as well: no more *Entwicklung*.

With the almost immediate non-storage of received photographies the endurance of the past as described by Barthes ("ca a été"[60]) dissolves as well.

While Walter Benjamin (1936) lamented the loss of "aura" (such as watching the shadow of a tree branch passing by in the progressive sunlight) by photographical image reproduction.[61] But let us have a closer look at this quote; it turns out that this chrono-scenario takes a lot of time, contrary to its instant photography which would rather result in a series of snapshorts in chrono-photographical aesthetics. Benjamin in fact describes this passing

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58 Bastos 2014: "Eventuality"

59 See Bernard Stiegler, Verkehrte Aufhzeichnungen und photographische Wiedergabe, in: Michael Wetzel / Jean-Michel Rabatè (eds.), Ethik der Gabe. Denken nach Jacques Derrida, Berlin (Akademie-Verl.) 1993, 193-210

60 Roland Barthes, La chambre claire. Notes sur la photographie, Paris (Gallimard / Seuil) 1980

61 Walter Benjamin, Kleine Geschichte der Photographie, in: same author, Medienästhetische Schriften, Frankfurt/M. 2002, 309

shadow of a tree branch (bough) like the *gnomon* of the ancient sun dial which is an anlog time measuring medium *par excellence*, different from the digital clock.

The more precise the photographic snap-shot ("still") has become in the time-critical sense, the more it did not confirm but irritate the human perception of the present which physiologically and neurologically rather embraces an interval of around three seconds. The numerical sampling of the present (which Henri Bergson and Martin Heidegger already criticized as "mathematical time" of cinematography and the oscillating clock) de-anthropologizes the present moment. The technical "instant" itself has becomme fuzzy. The aesthetic equivalent of this micro-temporal irritations is the photograpic flicker, as expressed in Anton Stankowski's photography of a passing car (1929). In a kind of representational oxymoron, speed itself becomes the message of the photographic still. What had been a deficiency in early photography - the comparatively long time of exposition required to produce a Daguerreotype - has (after the mastering of that problem by Talbot's Gelatine kallotype) returned as a chrono-aesthetic message.[62]

TEMPORALIZING THE PRESENT (DIFFERENTIAL DELAY)

Media analysis of the present in high frequency

It takes an observational temporal difference to clearly separate actual news (information) from the redundant archival accomulation of data from the past.

On the final announcement in the radio play *Vergiss nie, was du gesehen hast*, broadcasted 24th of June, 2013, at Deutschlandradio Kultur channel, the editor "m" writes on 26 June: "The news message at the end of the play" - an US-American bomb attack on Iraq nuclear plants -" of course, is part of the fictive drama and the end of a bitter story by the Finnish author Illka Remes." What in a dramaturgical con"text" serves as a "authentification signal" is not identifyable as fictive in the time-critical context, when listened to just as final part of the radio play itself - which then sounds like "breaking news". Instead of the cultural / semiotic con"text" there is a temporal context, better called: synchrony, which - when interrupted - creates the traumatic intrusions of the *War of the Worlds* effect achieved by Wells' notorious radio play.

A culture of "TV on demand" in the Internet (based on the electronic archive) replaces live TV. Even streaming media involve micro-temporal storage (the necessity of buffering a whole frame, which opens a juridical door or copyright violation claims).

It was in 2006 that the BBC ("The Future of Television is on demand") based on a digital archive allowed for "seven day catch up", followed by ZDF in Germany

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62 See the Berlinische Galerie exhibition *Sprung in die Zeit. Bewegung und Zeit als Gestaltungsprinzipien in der Photographie*, Martin-Gropius-Bau, Berlin (1992)

(*Mediathek*) soon after.[63]

From "archiving" presence to delayed presence (a question of storage theory, the question arises: When does "transmission" end and "storing" start?: A radio conversion broadcasted on German FM radio Kulturradio in the morning of 24th October 2013 at around 8.25 a.m. was finally supplied with the information that the conversation had been recorded an hour ago. Ironically, the talk was about the supposed interception of chancelor Angela Merkel's private cell phone by US intelligence service NSA.

As pointed out by Timothy Barker[64], cinema separates movement into stills, television fragments images into discontinuous lines and the digital computer converts signals into bits. This results in new, discrete temporalities which on the discursive surface are documented by performative practice ("social media").

High-frequency uploads and "streaming media" *online* religates the formerly separate ("secret") archive to the almost immediate present (depending simply on bandwith and channel coding conditions). Formost the financial markets are now based on the time-scale of high frequency computing, resulting in fluctuations and rhythms which nano-temporally subvert the notion of the present moment itself. The trading floor turns into media theatre. Media and cultural theory has so far attempted to account for such media-induced temporalities in terms of acceleration and speed.[65]

In algorithmic computing, there is a radically new quality of the way times are operationally engineered - what Boris Groys refers to as perpetual series of presents.[66] The symbolic order of cultural time which has so far been based on the clearly separated temporal categories past, present, and future, implodes into operative anachronism. Technological devices that sample the present techno-mathematically "analyse" time through Fourier Transform.

In the media-economy of high frequency trading, the beast are time-beasts. The time lense shifts from macro-temporal economical cycles to micro-temporal intervals. At places such as the virtual Stock Exchange, time-critial temporalities become econimical temporealties. High Frequency Trading operates with time-"hiding" purposes like these, just like perceptual experiments in the 1960s: smuggling ultra-short moments of Coca Cola advertising into a regular TV movie, not consciously noticed by the viewer.

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63 See Günther Schatter, Zeitsouveränität und elektronisch Medien. Das Programm und seine schrittweise Selbstauflösung, in: Klaus-Dieter Felsmann (ed.), Der Rezipient im Spannungsfeld von Zeit und Medien, Munich (kopaed) 2008, 53-67 (63)

64 See Timothy Scott Barker, Re-composing the Digital Present, in: Contemporaneity: Historical Presence in Visual Culture, vol. 1, no. 1 (2011), 88-104; same author: Time and the Digital. Connecting Technology, Aesthetics, and a process Philosophy of Time, Hannover, New Hampshire (Darmouth College Press) 2012

65 See R. Hassan, Empires of Speed, Leiden (Brill) 2009

66 Boris Groys, Comrades of Time, in: D. Hauptmann / W. Neidich, Cognitive Architecture, Rotterdam (010 Publishers) 2009

Time-critical economy works especially in businesses.

The algorithmic "Markov present"

It is in the very time-critical nature of stored-program computing (in the so-called von-Neumann architecture) that the present infinitesimally implodes. When *in being*, a techno-logically implemented algorithm makes the digital computer operate in multiple cycling-units, while at the same time adhering to its "one step at a time" imperative of linear (as opposed to parallel) processing. There is no actual present moment until the program comes to an result. The present rather has to be induced by observation, e. g. in the debugging mode where the actual computing can be frozen into a single step or machinic "state" (Turing's term from 1936).

From a psychophysical experiment with a quantum light source that generates discrete states of light, it resulted that humans can detect a single-photon incident on the cornea with a probability significantly above chance. "[T]he probability of reporting a single photon is modulated by the presence of an earlier photon, suggesting a priming process that temporarily enhances the effective gain of the visual system on the timescale of seconds"[67]

- which almost matches the criterion of a first-order Markov process in probability theory. Such a stochastic process is almost memoryless: "[A] process satisfies the Markov property if one can make predictions for the future of the process based solely on its present state just as well as one could knowing the process's full history. i.e., conditional on the present state of the system, its future and past are independent."[68] Therefore a Markov process "can be used to model a random sytem that changes states according to a transition rule that only depends on the current state" <ibid.> - which is a true existence in the present, living in discreet states as a function of dynamic, self-adaptive re-configurations of the cognitive Turing Machine "program" wiring.

THE TEMPOR(E)ALITY OF AFFECT

Traditional and posthuman understanding of affect

The cybernetical assumption of co-original (therefore analogous) signal processing in animals and machines (Norbert Wiener) results in combined human-machine systems. The cybernetic organism incorporates exogeneous components extending the self-regulatory control function in order to adapt it

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67 "Direct detection of a single photon by humans", in: Nature Communications 7, article number: 12172, doi:10.1038/ncomms12172 (retrieved 25 July, 2016), abstract

68 Retrieved from "https://en.wikipedia.org/w/index.php?title=Markov_process&oldid=712058457", referring to the entry "Markov process (mathematics)" in the Britannica Online Encyclopedia; accessed 25 July, 2016

to new environments."[69] From this derives a guiding hypothesis for the current project: This cybernetical assumption counts for the *temporal coupling* of human and (chrono-)techologies as well. Once human perception is "tightly" (Fritz Heider / Niklas Luhman) coupled to a technical medium, it is subject to technological tempor(e)alities; aptly Henri Bergson described the interlacing of present perception and past recollections as electric circuit.[70] The affordance (Heidegger's *Zuhandenheit*) of new time technologies not only shapes but generates temporal consciousness. When humans are in the Internet browsing state, memory there is not past, but a spatio-temporal latency.

Affect might be defined as a figure in the psychoanalytic, technological and tempor(e)al sense - to be supplemented by the sonic dimension.[71] In writing about his childhood (*Berliner Kindheit*), Walter Benjamin reflected on the nature of memory as an analogue of hearing, extending the *déjà vu effect* to the *déja entendu* - "events that reach us like an echo awakened by a call, a sound that seems to have been heard somewhere in the darkness of a past life. [...] the shock with which moments enter consciousness as if already lived usually strikes us in the form of a sound."

Different from Henri Bergson, Gilles Deleuze detaches the affect from the subject-body and rather locates it within the technological procedure[72] - which results in a techno-trauma indeed. What Deleuze refers to Francis Bacon's paintings especially, is evident for electronic imagery and the "scanning finger" (McLuhan) of the cathode tube ray in analog television and video as such: "It addresses our nervous system directly. It creates a being of the sensation that exits in itself and reveals to us a state of becoming-nonhuman"[73] in terms of a "pre-personal perception"[74].

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69 Paul N. Edwards, The Closed World. Computers and the Politics of Discourse in Cold War America, Boston, Mass. (MIT) xxx, chap. 9, note 1 (referring to Manfred Clynes / Nathan S. Cline, Cyborgs and Space, in: Astronautics, September 1960)

70 "Tatsächlich beginnt sie [sc. die Erinnerung, *memory*] ja erst dann nicht nur mit der Gegenwart zu `verwachsen´, sondern mit ihr eine Art *Stromkreis* zu installieren, in dem das Erscheinungsbild auf das Wahrnehmungsbild verweist und umgekehrt." Gilles Deleuze, Bergson zur Einführung, ed. and transl. Martin Weinmann, Hamburg (Junius) 1989, 87, referring to Bergson's *Matière et Mémoire*

71 See, e. g., Helmut Lethen, "Knall an sich". Das Ohr als Einbruchtstelle des Traumas, in: Inka Mülder-Bach (ed.), Modernität und Trauma. Beiträge zum Zeitenbruch des Ersten Weltkrieges, Vienna (WUV) 2014, 192-210

72 See Mark B. N. Hansen, New Philosophy for New Media, 32 f. Referring to current neuro science, Hansen insists that it is the bodily perfection which enframes and modulates the (merely technical) information.

73 Mark Hansen, Deleuze and the Three Powers of Literature and Philosophy, in: Deleuze and Guattari. Critical Assessments of Leading Philosophers, ed-. Gary Genosko, Londpon / new York (Routledge) 2001, 207-222 (216)

74 Claire Colebrook, Gilles Deleuze, London (Routledge) 2002, 38

While emotion is still "narrativizable"[75], affect cuts through the senses and the body without being controlled by the subject.

"[A]n understanding of the messy materialities of affective regimes stems largely from nineteenth-century physiology, experimental psychology and a variety of scientific and experimental measurements [...]. In other words, there is a media-archaeological side to the notion of affect as well."[76]

The micro-temporal momentum of affect

Affect is a signalling of a non-discursive, non-narrative traumatic timing. The co-origin of trauma studies (Freud) and technical cinematography around 1900 is not coindidental in itself. To formulate it rather in engineering than in psychological terms, there is human perception of signals in the Low Frequency Band of which the mind is consciously aware (like audio signals between 16 Hz and around 16 kHz), as opposed to signals in the High Frequency Band which are there but not perceivable for human senses - a sublime existence. There are time events (and their manipulations) of which humans are simply not aware, just like radio and television transmission as technical event (carrier frequencies). But still they *result* in affective modulations of human sensation - indirectly, as *sublime tempor(e)ality*.

The tempor(e)ality of a deferred present becomes evident from experiments on the formative interval of perception, a micro-temporal lag between the brain activity initiating a movement and the conscious registering of the decision to act. The notion of any delay, for technologies of telepresence, is rather an alien idea; it is the metaphysics of the instant which buttresses their contemporaneity. Regarding the techno-traumatic tempor(e)ality flashing from electronic television is bound to the temporality, the difference between analog and digital becomes literally "decisive", since sudden change (catastrophe) corresponds with digital switching: "The time proper to catastrophe might be thought of as compatible with that of the digital watch where time is cut off from any sense of analogical continuity, and the connection between moments is severed. One is faced only with the time of the instant - isolated and alone."[77] This is true, though, since the implementation of the escapement-controlled mechanically wheeled clock.

Technologically induced micro-traumatic moments escalate with the rupture between mechanical cinematography and electronic (analogue) images: "With film, the brain does not 'fill in' the images on the screen - it fills in the motion between images. with television, the brain must fill in (or recall) 999.999 percent of the image at any given moment ["given moment" = time-"data"], since the full image is never present on the screen."[78] This corresponds with Caruth's definition of the trauma as absence, lacuna (as opposed to Freudean

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75 Brian Massumi, The Autonomy of Affect, xxx, 221

76 Jussi Parikka, What is Media Archaeology?, Cambridge / Malden, CA (Polity Press) 2012, "Introduction", 30

77 Doane 1990: 238, note 3

78 Tony Schwartz, The Responsive Chord, Garden City, N. Y. (Anchor) 1974, 16

"desire"). The Lacanean ("lacunean") absence is being micro-temporalized, towards the "tempo-real".

Affect is not only a mode of temporal experience, but itself a radically time-critical form of perception. According to Brian Massumi, affect precedes consciousness within human signal processing, as demonstrated by registering an electric impulse on the skin.[79] Thus a disruptive gap between affective and conscious ("thoughful") perception of one and the same micro-event takes place, resulting in an affective/cognitive temporal dissonance - in fact the traumatic tempo-momentum.

For Brian Massumi, the "missing half-second" is not a lack, but a redundancy: "For the present is lost with the missing half-second, passing too quickly to be perceived, too quickly, actually, to have happened."[80]

cMEDTEXTYALE / Once photography, the first autonomous media agency in its modern sense, became subject of the archive, the sense-affective, presence-generating power[81] of signal-based media cuts short the distance which is a prerequisite for *historical* analysis, in favor of mnemonic immediacy - the "electric" moment, a shock for the affective experience of temporal presence and past.

cMED-AUDIOVIS / Hermann von Helmholtz detected that the run-time (speed of progagation) of signals in the motoric nerves of a frog counts around 24 meter/sec. This speed recalls a synchronization problem within humans, when technical audio-visual synchronicity might lead to irritation when compared to physical signal run-times in real nature[82]; a lightning stroke is seen more immediate than the accompanying thunder is heard. For the temporal domain of human perception, the media psychologist Herta Sturm once experimentally explored that while every day perception which always includes a slight temporal delay of reaction involving a kind of inner, subvocal speech[83], electronic media force their audience into immediate affection. *Immedia* interfaces deprive humans of their natural chance of delayed perception. Does nothing or everything happen within this half-second? Electronic immediacy, the almost missing micro-temporal gap, results in asynchronicity in signal processing time regarding humans on the one hand and electronic machines on the other, a difference in phase delay of signal transfer between technology and human physiology. But quasi-technological timing can be detected within human neuroprocessing itself, a kind of chrono-engineering. Pre-emptive activity is what apparently is stimulated in the pre-frontal cortex of the brain

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79 Brian Massumi, Parables for the Virtual, Durham / London (Duke UP) 2002, 28f; see Barker 2012, 87

80 Massumi 1996: 224

81 See Hans Ulrich Gumbrecht, Production of Presence. What Meaning Cannot Convey, Stanford University Press 2004

82 See Uwe Sander, Die "fehlende Halbsekunde", in: Handbuch Medienpädagogik, Berlin / Heidelberg / New York (Springer) 2008, 290-293 (292)

83 Hertha Sturm, Wahrnehmung und Fernsehen: Die fehlende Halbsekunde. Plädoyer für eine zuschauerfreundliche Mediendramaturgie, in: Media Perspektiven 1/84, 58-65 (61)

which does not simply react to incoming sensations but time-critically tends to anticipation (familiar from the difference between "live" and "real-time" signal transmission within communication media).

"The word *communication* will be used here in a very broad sense to include all the procedures by which one mind may affect another. This, of course, involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet, and in fact all human behavior. In some connections it may be desirable to use a still broader definition of communication, namely, one which would include the procedures by means of which one mechanism (say automatic equipment to track an airplane and compute its probable future positions) affects another mechanism (say a guided missile chasing this airplane)."[84]

A perceptual gap opens between the actual moment of the audio track and the visual frame in cinematography: introducing a loop which allows for the pre-cursive "reading" (by photo-cell) of the audio track on the film reel. Between the run-time of audio-through-air and visual emanation reflected from the screen opens a techno-traumatic micro-temporal gap (that is, induced by a technical asynchronicity).

TempoR(e)alities and "The Crannies of the Present" (Massumi)

The delayed present unfolds as a function between the mediated and the immediate. "Journalism" in the media-archaeological sense not only refers to the French *jour* = day, the day-to-day reports in the early Medieval Annalist tradition, but as well to the chrono-technical rhythm of the printing press.

Sigmund Freud's thrifold psychic levels might be correlated to the temporal domain: "Ich" (subjectively experienced presence), "Es" (traumatic irritation by invasion of the temporal "real"), and "Über-Ich" (the discourse of history as symbolic time order). According to Freud's definition, both affect and trauma break through the cognitive "Reizschutz" of symbolically ordered time which surrounds our perception. If we take Freud's expression of the psychic "apparatus" literally, the human sensation corresponds with media in techno-logical resonance. From there derives the psycho-technological power of media - the techno-trauma. The potential of media is the technological real, resulting in specific forms and experiences of tempor(e)ality.

Even if "tele-vision" seems to indicate that the scopic regime is remote: perception from afar by definition, optical sensation itself is based on electro-magnetic waves which reach the human eye almost instantaneously. Human perception - even if wachting a video recording - is always in the present, but in different audio-visual ways / waves. TV is always "in the now" (from the camera and brodcasting perspective); with online communication media, the receiver

84 Warren Weaver, Recent Contributions to the Mathematical Theory of Communication, in: Claude Shannon / same author, The Mathematical Theory of Communication, Urbana (University of Illinois Press) 1964, 1

as well is always "on". Already TV "live" transmission (on the signal side) provided for synchronicity in time, a being-there-in-time (while not in space), in decisive difference to cinematography which is a storage medium, re-prjecting an always delayed present - even with a hrinking difference in the *Zwischenfilmverfahren* of German TV on occasion of the Olympiad 1936 in Berlin.

A critical moment happened at the Riga documentary film festival in 2001 on September 11th, when after watching a film projection in the cinema theatre, the audience was led for a coffee break into the adjacent conference room. There a TV monitor showed the puzzling images of a collapsing World Trade Tower. In the TV live coverage, the electronic medium came "to itself" (in Hegelian terms). On that Tuesday, the looped CNN "breaking news" interrupted the filmic event - breaking the cinematic situation by the TV apparatus.

In analogy to the "optical unconscious" identified by Walter Benjamin in relation to the camera lense, there is the "temporal unconscious" as well. Time-critical analysis focuses of the *arché* of the signal event itself as incipient actions, known from electro-acoustic analysis of the transitional "attack" in striking a musical tone, or the flashing cinematographic image. Such a temporal event does not necessarily unfold in a chronological order. The integration of the past with the here-and-now of the present, and the immediate becoming-past of the present moment ("the infra-instant", according to Brian Massumi) are "differential aspects of the same integral enactment"[85].

MEDIA-ARCHAEOLOGICAL "AUSCULTATION" OF TECHNO-CULTURAL MICRO-TEMPOR(E)ALITIES

New "shapes of time"

On the scene of human culture, a new drama gets into focus: the techno-logically induced *chronopoetics* of microtemporal processes. Already in the context of the Radical Software journal of The Raindance video collective, "the neologism "chronetics" was put to use in ways that seem analogous with 'chronopoetics'"[86]. Both in neuroscience and in studies of electronic and digital technologies, the analysis of time-critical action develops into an epistemology which radically challenges the traditionally familiar terms of emphatic time, with a shifting emphasis towards the non-linear, stepwise sequential, loop-folded, algo-"rhythmic" events. There is a privileged affinity between sonic tempor(e)alities and time-critical, "timely" media.[87]

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85 As expressed by Brian Massumi, The Crannies of the Present, lecture at the Sawyer Seminar, Harvard University, end of April, 2014

86 E-mail Ina Blom (University of Oslo, author of *Auto-biography of Video Art*), April 14, 2011

87 The English adverb *timely* correponds to German "rechtzeitig, zeitgemäß, fristgerecht, frühzeitig"; see http://www.dict.cc/englisch-deutsch/timely.html, accessed September 8, 2014

Electronic media tempor(e)alty: "acoustic space" (McLuhan)

Sonicity for the analog electronic media epoque has been identified by Marshall McLuhan. The wall painting created by René Cera, Pied Pipers All (1969), for McLuhan's seminar room at the university campus in Toronto[88], in a psychodelic manner unreveals the television image as a sonic event. Whatever its apparent content, the tempo-real message of electronic media is "acoustic" in McLuhans sense of a different temporality: "[...] he argued that electronic media were submerging us in this acoustic environment, with its own language of affect and subjectivity. Acoustic space isn't limited to a world of music or sound"; the environment of electronic media itself engenders this way of organizing and perceiving chronospheres.[89]

But the digitally modulated (PCM) electrosphere of today differs from this radiosonic (AM) metaphor. With digital numbers, central characteristics of what McLuhan diagnosed for the printing press age have returned, thus bracketing the age of analog electronic (mass) media as a interplay of modernity. In a dialectric synthesis, mobile digital telecommunication is now combined with the characteristics of "acoustic space" which is simultaneity. According to Marshall McLuhan's *Media Log*, "[s]imultaneity is related to telegraph, as the telegraph to math and physics."[90] But this discrete simultaneity is of a different kind. "Now, Internet 'radio' isn't radio; it does not exploit the spectrum, and that is a big difference"[91] - just like the difference between music recorded in vinyl grooves and its Compact Disc inscription. Close analysis reveals bit streams which allow for information theory, thereby: mathematical intelligence to control the event of electro-magnetic signal transmission. This happens in sublime manipulation on the micro-temporal level. Even if (according to the Sampling Theorem) human perception might not even notice the difference between a hight definition analog television image and its digital equivalent, ontologically this image has transformed into a different time-object once the critical perspective of the "receiver" is not humans but technologies themselves.

The sonicistic sphere in McLuhan's sense is (almost) simultaneous instead of time-linear: "Acoustic space is capable of simultaneity, superimpositon, and

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88 See Fig. 3 in: Peter Bexte, xxx, in: Derrick de Kerckhove / Martina Leeker / Kerstin Schmidt (eds.), McLuhan neu lesen, Bielefeld (transcript) 2008, 323-xxx (331). Photo: Derrick de Kerckhove; *online*: http://www.greatpast.utoronto.ca/GalleryOfImages/VirtualMuseumArtifacts/PiedPipers.asp; accessed September 2nd, 2014

89 Erik Davis, Acoustic Cyberspace. Talk delivered at the Xchange conference, Riga, November 1997; *online* http://www.techngnosis.com/aco. Published in: Rasa A mite / Raitis A mits (eds.), Acoustic Space - net. audio issue, Riga (E-LAB) 1998

90 Marshall McLuhan, Counterblast. 1954 Edition, published by transmediale.11 Berlin (in cooperation with Gingko Press) in 2011

91 Davis 1997

nonlinearity, but above all, it resonates. 'Resonance' can be seen as a form of causality, of course, but its causality is very different than that associated with visual space [...]."[92]

Through resonance in a physical - not symbolically coded - system, micro-events can cause distant objects to communicate - close to time-tunneling and Tesla-like energy transfer.

begin cSOUND-ARC-AARHUS / Sound is not just mechanical attacks, vibrations to the ear or aesthetic pleasure for the brain (von Helmholtz) but adressing the human (pseudo-)sense of temporality. The true message of sound as event is processual time. The "tuning of the world" (Schafer 1977) is a *timing* of the world as well. What looks physical (acoustic) is temporal in its subliminal affect. If the "sonic environment" is extended to so-called Hertzean waves as well, electromagnetism turns out as sublime temporality in all ways.

The chrono-poetical specificity of such sonicistic articulation can not be captured and subsumed by the logocentrism of traditional narrative historiography. "Acoustic space", as emphasised by Marshall McLuhan, is of a different temporal nature: not linear, but synchronous or reverberating.[93] McLuhan once called it "echo land" - which brings us back to signal delay time and micro-temporal folding.

Let us take this metaphor literally: acoustic echo implies delay, the very temporality induced by the medium as channel of signal transfer which once led Aristotle in his treatise *Peri psyches* to deal (media-)philosophically with the "Inbetween" (*to metaxy*) - no neo-logism as a term by Aristotle, rather a graphical neo-graphism by writing the adverb with a capital letter, thus turning it into a noun which (after its translation by medieval scholars) turned into the well-known *medium*.

"PHOTOGRAPHY was the mechanization of the perspective painting and of the arrested eye", whereas "Telephone, gramophone, and RADIO are the mechanization of post-literate acoustic space"[94]. Such sonic space is understood here as the epistemological existence of sound.

Notwithstanding his confusing electricity and electronics, McLuhan thereby made a crucial discovery about the intrinsically "acoustic" structure of electronic mediascapes. In a letter to P. F. Strawson, author of *Individuals. An Essay in Descriptive Metaphysics* (1959), McLuhan quotes from that work: "Sounds, of course, have temporal relations to each other ... but they have no intrinsic spatial characters."[95]

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92 Davis 1997

93 Marshall McLuhan / Bruce Powers, The Global Village. Transformations in World Life and Media in the 21st Century, Oxford et al. (Oxford University Press) 1989

94 McLuhan, "Five Sovereign Fingers Taxed the Breath" (1954)

95 Dated April 17, 1969. Letters of Marshall McLuhan, selected and edited by Matie Molinaro / Corinne McLuhan / William Toye, Toronto / Oxford / New York (Oxford University Press) 1987, 367

The immediacy of electricity has been valued essential by McLuhan as the definite difference to the Gutenberg world of scriptural and printed information:

"Visual man is the most extreme case of abstractionism because has has separated his visual faculty from the other senses <...>. <...> today it is threatened, not by anly single factors such as television or radio, but by the electric speed of information movement in general. Electric speed is approximately the speed of light, and this consitutes an information environment that has basically an acoustic structure."[96]

At the speed of light, information is simultaneous from all directions and this is the structure of the act of *hearing*, i. e. the *message* or effect of electric information is acoustic - even when it is perceived as an electronic image (as defined by the video artist Bill Viola in his essay "The Sound of One Line Scanning"[97]).

Very media-archaeologically, McLuhan's identification of the essence of electronic media as "acoustic structure" evidently refers to an epistemological ground, not to the acoustic figure (what ears can hear). This ground-breaking took place with the collapse of Euclidic space into Riemann spaces and culminates around 1900 with quantum physical notions (the para-sonic wave/particle dualism, up to the "superstring" theory of today) on the one side, and Henri Bergson's dynamic idea of matter as image in the sense of vibrating waves and frequencies.[98] McLuhan's "acoustic space" is oscillating time and implicitely re-turns in Gilles Deleuze's "interval" philosophy. Less philosophically, it actually happens within algo-rhythmic media.

In a media-archaeological sense, the message of the sonic is not limited to the audible at all, but a mode of revealing modalities of temporal processuality - which requires epistemological auscultation. / end modSOUND-ARC-AARHUS

The media-archaeological approach to (micro-)tempor(e)alities is obviously influenced by philosophical or physical thoughts as performed by Alfred North Whitehead - therefore the spelling of "tempor(e)alities", alluding to Whiteheads dynamic theory of *Process and Reality* - but more strictly *grounded* in the technical focus of media archaeology.

Let us not reduce phenomenology to human sensation, perception and mind, but extend it to a kind of phenomenology *of* and *by* the machine as made possible by signal sensors. It is the "sample&hold" mechanism which not simply translates but even transsubstantiates (to borrow a term from Catholic religous liturgy) the analog physical world into digital computability.

It is not just a further variance in the long history of philosophy of time but, in

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96 Marshall McLuhan, letter to Barbara Ward, 9 February, 1973, published in: McLuhan 1987: 466

97 Bill Viola, The Sound of One Line Scanning, in: Dan Lander / Micah Lexier (eds.), Sound by Artists, Toronto / Banff (Art Metropole & Walter Phillips Gallery), 1990, 39-54

98 Henri Bergson, Matter and Memory, London (George Allen & Unwin) 1950, 276

identifying concrete techno-logical scenarios that media archaeology analyses new "shapes of time" (George Kubler) - by reading circuit diagrams instead of knowledge historiography only. The sample-and-hold mechanism performs *the ephemeral archive* - with its records being "stored" only for a fraction of a millisecond. Condensers as among the smallest electro-physical storage elements, combined with transistors, function as micro-archives here. The electronic bit - other than most people think it - is a temporal being in such electronic circuits, not punctual, but a suspended instant of time (as voltage)

The media-archaeological approach still shares a core cybernetic assumption (cybernetics is not historicized here as a chapter in the history of knowledge, but still burns in the hearts of media archaeologits): From the *coupling* of humans to techno(chrono)logical beings (artefacts), a specific experience of time results.

Let us first of all separate the question of "temporality" from history as a specific concept of narratively organizing temporal sequences. Once our chrono-analysis is suspended from the historical discourse, a more radical challenge arises: Is it possible to deal with micro-temporealities without mentioning the transcendent signifier "time" at all - in favour of a multitude of descriptive terms, a "field"?

"Time - today <...> - seems to reveal a new structure and to unfold in a rhythm that is different from the 'historical' time that governed the nineteenth- and the early-twentieth centuries. In this new chronotope - for which no name exits yezt, even though we live within its forms - agency, certainty, and the historical progress <...> have faded into distant memory."[99]

["Just as linear history begins with writing, it ends with TV"[100], McLuhan radically declared in a post-Hegelian mode. History depended on a cultural technique which is alphabetic, linear writing. The "writing" of images and texts on the cathode ray tube for television and computer monitors is of a different kind. Electronic media, therefore, are not just another variance in the history of technology but establish a new kind of temporal reality which escapes the concept of history.]

In contemporary society where the grand symbolical horizon and panoramic (pan-chronic) bird-eye view of temporal extension (religious eternity, the epoques and philosophy of history) has been condensed into (or even replaced by) ever shrinking temporal intervals and a focus on condensed present, the close analysis of decisive temporal actions reveals the drama of time-critical media.

The public TV channels in Germany legally are obliged to provide the possibility for users of streaming media online access to a selection of broadcasts stored for a week. What techno-cultural timing unfolds is an extended present, differentiated by a *media dramaturgy* of minimal or even micro-times.

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99 Hans Ulrich Gumbrecht, After 1945. Latency as Origin of the Present, Stanford, Cal. (Stanford University Press), 38

100 Marshall McLuhan, Counterblast, New York (Harcourt, Brace & World) 1969, 122, as quoted in Bexte 2008: 332

"Liquefying" the archive

David Lynch's film *Inland Empire* which begins with the image of a spinning record on a record player. "As the needle drifts across the timeles surface of reified sounds, we are, once again, in the realm of mechanical preproduction and the logic of industrial time."[101]

As a "consequence of these juxtapositions, interjections, cuts and ruptures, <...> the loss of the chronology and directionality of time. <...> the digital fragmentation of time is terrifyingly opaque and illegible for the human subject."[102] Such a technological sublime leads to a sublime micro-tempor(e)ality.

Henri Lefebvre, in *The Production of Space* (Cambridge 1991), diagnosed an erasure of time by space; Henri Bergson's criticized the mechanical (escapement-driven) clock measurement of time as mathematization which is spatialisation instead of true temporal duration.

cMEDMEM-GLASGOW / With the present interpreted as a function of memory operations (both neurologically and digitally), the transformation of the traditional temp*aura*lity of archival storage needs to be observed. From archival space to archival time, the archival "field" gets into focus. Dynamic micro-media memories induce a cultural shift of emphasis from permanent storage to restless transfer. With the aesthetics of re:load, the affinity between the archival operation and cybernetics turns out, resulting in feedback memory and timeshifting. Once these transformations have been analyzed, the topic "suspended memory *versus* total recall" results in a plea for the *secret archive* again.

cARC-ART-KURENNIEMI / There are good reasons for questioning the static concept of an "archive" as appropriate term for digital record structures since as a metaphor it is increasingly becoming a hindrance for the analysis of dynamic data storage and circulation. The computer hard disc *moves* stored data in post-structural ways, just like the gramophone record and the magnetic tape did with recorded electronic signals (sound and / or video) before.[103]

Not yet memory? Focus on storage tempor(e)alities

The volativity of data stored in SRAM or DRAM makes all the media-epistemic difference.

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101 Zoltán Glück, After Midnight, or: The Digital Logic of Time Fragmentation in Inland Empire, in: Munitionsfabrik 19 (2008), HfG Karlsruhe, 8-11

102 Glück 2008: 9

103 On the archive becoming *processual* in digital algorithms, in accordance with Alfred North Whitehead's philosophy of the dynamic event (*Process and Reality*, New York 1929), see Barker 2012

cMEDZEIT-AFFEKT / According to Husserl, time is "a stream of experiences with an infinite chain of *now*-points <temporal> (impressions), each of them surrounded <...> <embedded> by a retention (a now-point just passed) and a protension (an expectation of a now-point which is still in the future but which becomes a now-point in the present"[104].

This does not refer equally to the auditive and the visual but rather time-critically counts for acoustic (the mechanical vibrational touch) and haptic sensation especially.

cMEDMEM-OSLO / There is micro-memory involved in the sonic perception of presence already; the present is by no means experienced as punctual "now". On the micro-acoustic level this re- and protention has been discussed to explain melody experience by Edmund Husserl[105] and Henri Bergson and fits into what neuro-science calles the time-window of "presence" as perceived within humans: about three seconds of duration which susprisingly corresponds with the length of one hexametric verse in oral poetry like Homer's.[106]

Micro-archiving the present: intermediary storage, delay lines

Electro-mechanic transmission of photographic images via telegraph cables in 19th century was performed via intermediary storage, the "digital" data carrier of punched cards. Even if at first glance, rather complicated, it relieved communication engineering from the delicate time-critical synchronisation problem between sender and receiver.[107]

"In the convergence between a repetition and a renewal lies the tendency to archive while bringing forward: past and present instantly simultaneous in the fragmented image. While it loops the past, the digital creates an image of an archival strategy where time passed becomes constantly accessible for the future. [...] reality's duration seems to have become a continuous stream of information potentially open for another time."[108] / end cMEDZEIT-AFFEKT-

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104 As paraphrased by K. R. Eissler, The Psychiastrist and the Dying Patient, New York (Intenrational University Pres) 1955, 272, quoted here after Hartocollis 1983: 4

105 "Jeder Ton hat selbst eine zeitliche Extension, beim Anschlagen höre ich ihn als jetzt, beim Forttönen hat er aber ein bereits neues Jetzt, und das jeweils vorausgehende wandelet sich in ein Vergangen": Edmund Husserl, Vorlesungen zur Phänomenologie des inneren Zeitbewußtseins (ed. Martin Heidegger [*1928], 2nd ed. Tübingen (Niemeyer) 1980, 324

106 See Fred Turner / Ernst Pöppel, The neural lyre. Poetic meter, the brain, and time, in: Poetry (August 1983), 277-309

107 See Christian Kassung / Franz Pichler, Die Übertragung von Bildern in die Ferne, in: Albert Kümmel-Schnur / Christian Kassung (eds.), Bildtelegraphie. Eine Mediengeschichte in Patenten (1840-1930), Bielefeld (transcript) 2012, 101-121 (110)

108 Markos Hadjioannou, From Light to Byte. Toward an Ethics of Digital Cinema, Minneapolis (Univ. of Minnesota Pr.) 2012, 174

IRRITAT

Between the archive and the anarchive there is temporary storage. Proper archives essentially aim towards long-term, if not even the unlimited preservation of their documents and today`s media archivists grapple desperately with the problems of technological obsolescence; the temporalisation of archives therefore is an anarchival element in the economy of cultural tradition. New concepts like *The Archive in Motion* (Rossaak 2010) and `temporary archives` are symptoms of this temporalisation of the archive. The immediatenesss of the retrieval of immense volumes of data trough online databases contends with an increasingly short-term maximum usability period, which compemporary culture knowingly accepts. Yet this temporalisation of the symbolic order is predetermined at the operative level of the present itself, namely in the practice of signal and data transmission. Delay lines served the micro-synchronisation of PAL colour television signals as well as the shortterm maintenance of data words in the first electronic computers. It belongs to the nature of so-called new media that they compute by shifting voltage levels interpreted as binary states, constantly accumulating interim values and then deleting them again. The mathamatisation of technical communication by Shannon results in a transmission channel which consistes of discrete temporary storage – an unexpected return of the familiar archival or yet chritically radicalised. The vocabulary of classic archivology fails when faced with such micro-temporal modes of technological action.[109]

"Time of non-reality": *Totzeit*, negative time

Not only do electronic systems tend from perceptible timing operations to subliminal micro-temporal operations (like the in- or rather de-creasing clocking and cycling units in digital computing); a new quality emerges with "binary" information theory: Norbert Wiener's notion of "time of non-reality" which is negative time which does not "count" in binary counting (computing) - realis switching moments (hysteresis).

"Less than no time": Telegraphy and the undertunneling of the transmission channel

Case Mai 15th, 2014: Just having had responded to an electronic mail which stayed resident in my computer mail box for a while of 24 hours, sending it off, the addressee unexpectedly turns up at my door. Even before greeting, a ping noise out of his/her pocket indicated that the mobile phone has just received my answer, resulting in an irritating moment of non-reality, under-tunneling the spatio-temporal channel.

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109 See W. E., entry "Zwischenspeicher / Temporary Storage", in: AnArchive(s). Eine minimale Enzyklopädie zur Archäologie und Variantologie der Künste und Medien, ed. Claudia Giannetti, copy-edited by Eckhard Fürlus, Oldenburg (Edith-Russ-Haus für Medienkunst) 2014, 175 f.

cDIGITAL-CULTURE-TATE / The essence of the temporal economy of tele-communication is capitalist chrono-logics, as remarked by Karl Marx in 1857:

"[...] while capital must on one side strive to tear down every spatial barrier to intercourse, i. e. to exchange, and conquer the whole earth for its market, it strives on the other side to annihilate this space with time, e. e. to reduce to a minimum the time spent in motion from one place to another"[110]

- as already remarked by Heinrich Heine, in his 1844 comment on the opening of a new railway line between Rouen - Paris, "killing space by time".[111] But the transformation into a different kind of temporal suspense of such shrinking delay intervals (in German literally *Nachträglichkeit*) known from postal communication, in times of mathematically informed, is binarily coded data transfer.[112]

The psychological discovery of the "tenth of a second" as perceptual unit of presence coincided not only with the chrono-photographic and cinematographic frequency of image projection per second to produce the impression of a continuous movement, but as well with the "dot" and "dash" rhythm of telegraphic communication in late nineteenth century; in fact the measuring and transmission instruments were co-originary. Commenting on "modern communication", Thomas Edinson's chief laboratory engineer remarked: "We all live on a tenth of a second world."[113]

This counts for the recursion of telegraphic (that is: symbolically discrete) signal transmission in digital broadcasting as well:

cMEDZEIT-AFFEKT-IRRITAT / "[...] new media via cables or satellite reconstruct media temporal configurations by the accelleration and compression of time."[114] This happens within such signal transfer technologies itself: audio and video compression is a core operation for digital signal processing in streaming media. The Internet provides for (almost) immediate electronic copies of binary values stored in central servers - rather topological than transmissional (in the traditional signal broadcasting sense).

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110 Karl Marx, Grundrisse. Foundations of the Critique of Political Economy (Rough Draft), Harmondsworth (Penguin) 1973, 538 f.

111 See Roland Wenzelhuemer, Globalization, Communication and the Concept of Space in Global History, in: Historical Social Research, vol. 35, No. 1 (2010), 19-47; furthermore Jeremy Stein, Reflections on Time. Time-Space Compression and Technology in the Nineteenth Century, in: TimeSpace. Geographies of Temporality, ed. by Jon May / Nigel Thrift, London / New York (Routledge) 2001, 106-119

112 See Siegert 1993

113 A. E. Kenelly, The Metric System of Weights and Measures, in: Scientific Monthly 23, no. 6 (1926), 551 [quoted here after: Jimena Canales, A Tenth of a Second. A History, Chicago / London (Univ. of Chicago Pr.) 2009, 5

114 Mira Moshe, Media Time Squeezing: The Privatization of the Media Time Sphere, in: Television & New Media 13(1), 2012, 68-86 (73)

The micro-temporal *camouflage*: High Frequency Trading

begin cMEDZEIT-AFFEKT-IRRITAT / Within virtual data event-fields like the digital Stock Exchange, time-critial temporalities become econimical tempo*realties*. High frequency trading operates with time-"hiding" purposes which had been tested in perceptual experiments in the 1960s: smuggling ultra-short moments of Coca Cola advertising into a regular TV movie, not consciously noticed by the viewer). This brings us back to the cinematographic affect.

A certain *irritation* of presence by the technical manipulatiuon of optical human perception of movement is based, among other criteria, on the physiological phenomenon of *irridation*.[115] This refers to the core procedure of kine-mechanics - not in its sense of creating an illusion of figurative movement, but as sensational physiology. / end cMEDZEIT-AFFEKT-IRRITAT

Neil Johnson (University of Miami) transcends the conventional view that, for understanding economic and financial markets, long-term trends (diagrammatic time lines) have to be examined. Now that such events happen on the scale of seconds and time-fractions below, analytis has to approach such signals in terms of communication engineering and mathematical stochastics *like* (or even *as*) noise, that is: statistically insignificant. In the runup to the 2008-2009 financial crisis, a concentration of miniature flash crashes occurred in banking stocks:

"[I]t suggests a link between what goes on at a sub-second level and what happens on the scale of months. At that point it started to look like an ecological system. Because [...] you have predators of all sizes [...]. The algorithms are all looking for and picking up some kind of weakness in those particular bank stocks [...]" - not actually causing the crash, "but they were like sensors of the impending bigger weakness".[116]

Such time-critical algorithms are time-beasts. The focus of Delta-*t* analysis shifts from macro-temporal economical cycles to micro-temporal intervals.

Interplay: Gaming with the Pin Ball machine and time of the tape: spools, loops

begin cHAND-APPARAT / The human hand is time-critically coupled in the cybernetic sense to the Pin Ball machine known from public houses, as described in a typescript entitled "Flipper" by Friedrich Kittler from the 1960s or

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115 See further Reiner Matzker, Das Medium der Phänomenalität. Wahrnehmungs- und erkenntnistheoretische Aspekte der Medientheorie und Filmgeschichte, Munich (Fink) 1993

116 Andrew Smith, Fast money: the battle against the high frequency traders, in The Guardian *online*, 7th June, 2014; http://www.theguardian.com/business/2014/jun/07/inside-murky-world-high-frequency-trading (accessed 15th July, 2014)

70s which immediately anticipates the first generation of computer games.[117]

When discretely (not analog / diagramatically) calculating either in his mind on quare paper with a pencil and erasing head, man is in (Turing-)Machine state.

The challenge of anti-aircraft prediction in World War II from the point of view of the artillery, as confronted by Norbert Wiener - gave rise to *Cybernetics* itself (Wiener 1948, Introduction) - and by Claude Shannon in a different approach separating the physical laws of the machine (airplane) from the idiosyncratic (counter-)reactions of the human pilot.

The human "Flipper" game player with his hand(s) as interface to the automaton has to adopt to the tempor(e)ality of the machine; Kittler inserts a Latin quote. The equivalent to tactics in the temporal field of such cybernetic human-machine couplings is time-criticality. / end cHAND-APPARAT

cMEDZEITEXPERIMENT2 / Cybernetics has replaced the notion of the present moment as *stasis* by the insight into "Circular Causal and Feedback Mechanisms in Biological and Social Systems"[118].

In Bergsonean philosphy of time, time is "a tape running between two spools"[119] - opposed to the micro-temporal "samples" in William Burrough's magnetophonic cut-ups.

[Media-archeaological *musing* in the presence of such a magnetic tape spool is in a situation like prince Hamlet, equipped with his father's scull in Shakespleare's drama. The artefact is present-at-hand *versus* present-to-hand in Martin Heidegger's understanding: being re-played on a tape recording machine.]

Let us switch analysis to an even more subliminal level of temporal perception:

"Different stimuli which are processed within a *temporal window* of approximately 30 ms are treated as *co-temporal*, i. e., a temporal relationship with repsect to the before-after dimension cannot be established for such stimuli. Information gathered within a temporal window of 30 ms is treated as *a-temporal*, i. e., there is no temporal contuity defined and definable for stimuli that follow each other within such intervals."[120]

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117 The typescript will be published in the section "Miscellanea Curiosa" of Friedrich Kittler, *Gesammelten Schriften*

118 The original title of the so-called Macy-Conferences in New York, ed. by Heinz von Foerster 1949, and subsequently by v. Foerster / Mead / Teuber 1950, 1951, 1953, 1955

119 See Barker 2012; 59 f., referring to: Henri Bergson, The Creative Mind, N. Y. 1934/1992, 164

120 Ernst Pöppel, Reconstruction of Subjective Time on the Basis of Hierarchivally Organized Processing Systems. Lecture given at the conference: Time, Temporality and Now, Max-Planck-Gesellschaft, Schloß Ringsberg (at Tegernsee), February 1996, quoted here after Klose 2002: 359

We touch the tempor(e)al sublimity of "digital media": underscoring human perception in favor of an apparent continuity of time, but still being *sublimely* time-discrete.

Micro-archiving presence from analog to digital technologies: functional sounding

begin cMEDZEIT-AFFEKT-IRRITAT / The most common notion of "historical" time is based on the observational drawing of a distinction (in Spencer-Brown's terms) between past and the present. In digital computing, this distinction has collapsed technologically into the most minute, i. e. binary micro-temporal différance (in Jacques Derrida's neo-graphism) which made the binary system preferable to the decimal system which has still been applied e. g. in the ENIAC computer:

"In spite of the longstanding tradition of building digital machines in the decimal system, we feel strongly in favor of the binary system for our [sc. "memory"] devices. Our fundamental unit of memory is naturally adapted to the binary system since we do not attempt to measure gradations of charge at a particular point in the Selectron [sc. cathode ray tube] but are content to distinguish two states"[121]

- which makes all the difference to the time-functional classical black & white television electronic scan line, and to analog computing.

The electro-magnet relay and later the flip-flop materially provided for such a truly binary device. "On magnetic wires or tapes and in acoustic delay line memories one is also content to recognize the presence or absence of a pulse of (if a carrier frequenfy is used) of a pulse train."[122]

This leads to the time-functional use of sound which is *sonicity*.

Technical recording of sound itself is a process of storage. "The breaking of the time constraint has profoundly changed the nature of acoustic communication."[123] The temporality (and volatile being-to-death) of sonic articulation which hitherto could only by recorded symbolically by mnemonic notation is transformed into space and visualization by the very act of recording, making it available for analysis "outside of time" <ibid.>. The temporal essence of sound is thereby turned into a reified, objectified time object, from evanescence to the literally ob-scene.

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121 Section 5.2., in: Arthur W. Burks / Herman H. Goldstine / John von Neumann, Preliminary Discussion of the Logical Design of an Electronic Computing Instrument, in: John von Neumann, Collected Works, vol. 5, ed. by A. H. Taub, Oxford (Pergamon Press) 1961, 34-79

122 Burks et al. 1961: 227

123 Barry Truax, Acoustic Communication, Norwood, N. J. (Ablex) 1984, 117

- The traditional sound record - like the textual record - can be included within an institutional archival frame. With digital sound, though. literally every bit of sonic articulation becomes part of a generalized "archival presence", since a) every digital signal processing involves ultra-short quasi-archival intermediary storage and b) every sound "bit" becomes numerically addressable and thereby accessible to mathemtical / algorithmic manipulation. The archival frame is deconstructed and re-turns from within the digital archival records themselves. From analog to digital "archiving" of sonic presence, "the manner of storage determines the kind of control that can be exercised over it" - from manipulation to distortion <Truax 1984: 119>. At the same time, the analog-to-digital conversion results in a transsubstantiation of the audio signal: from the primary physical event to information which is essentially neither energy nor matter. Thereby the signal loses its time-indexical trace[124]; transitive wave forms become numerical, geometricised time. Electro-magnetic sound transduction must therefore to be set into quotation marks: "[...] the digital 'transduction' process includes the digitalization of the analog signal by the ADC, its <micro->storage and / or manipulation in binary number format, and its reconstruction as an anlog signal by the DAC" <Truax 1984: 139> - which is the conversion of an electronic embodiment of a number representation stored in the computer memory to discrete voltage steps at fixed time intervals (D*t*). The physically continuous original waves are thus transformed into quare waves; in fact every binary computational act is an abrupt form of oscillation between zero and one in a time-sequential form. Only by smoothing the square wave by filters the wave becomes continuous again.

A kind of micro-archiving of presence is conceptually and technologically implied in the real-time processing of signals, since as a digital time-discrete sampling and quantizing of moments from the present signal (punctualising the continuous signal event) it requires intermediary short-time storage of data. The concept of real-time and "interrupt" for user input in computing dislocates the metaphysics of pure presence to micro-deferred presence.

Instant archivization of the present reveals itself in newsradio channels with its frequent errors in (re-)play. What appears like actual news broadcast, by mistake (the new editor pushes the wrong button on his digital control panel) an event just reported is repeated again. It is a shock for the "presence" instinct authenticity contract between listener and radio station when it becomes apparent that there is not live transmission any more, but digitally stored ("sampled" on the micro- and meso-level) sound files - a presence which is "archived" already. The present event and storage merge into one with the increasing digital, i. e.: archiving recording of present spaces. The presence of space itself is being transformed into time-coded snapshots by increasing instant photography (I-pad) which step by step ("one bit at a time") *samples* presence (sampling in both technological and meso-temporal meaning). Space itself will be re-windable.[125] / end cMEDZEIT-AFFEKT-IRRITAT

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124 See Laura Marks 2002

125 See Alexander Galloway / Eugene Thacker, The Exploit. A Theory of Networks, Minneapolis 2007, 132. See as well the notion of *tx-transform* as technology of time axis manipulation and as title of a short film produced by Martin Reinhart with Virgil Widrich (35 mm, Austria 1998)

The fuzzy present of Internet communication

Jack Goody once defined tradition as "delayed transfer"; time-critical media archaeology applies such emphatic temporality from analysis of cultural history to the micro-temporal realm, as expressed in Norbert Wiener's *Cybernetics* 1948 when describing signal transfer in technical communication.

Tele-communication in "real time" (different from electro-magnetic "live" radio or TV signal transmission) does not exist in the physical world, but is computationally engineered to trap the human perception of the present window."[126] This window is sliding in *online* communication data packet switching (the reality of so-called "social web") - as has been designed to avoid traffic congestion in the Internet.

Metaphors like "streaming media" are misleading in their suggestion of a temporal flow. Even with respect to the signal carrier (the "flow" of electricity) information depends on the digitally coded electrons. Where humans believe to communicate messages, there is a non-human communication at work: computer-to-computer-connectivities. Any political criticism of the micro-physics of power has to focus on the time-critical eventalities on the most physical level of the OSI network model.

Network culture is less about modernist clock time but more about latencies. The delayed present stems from the "hyperbolic temporalities of digitality" <Parikka ibid.>. Speculative media theory asks experimental questions: What if data packets were humans, how (if at all) they experience time? <Parikka ibid.> In Web 2.0 packet switching, before any kind of nw "social memory" is triggered, intermediary storage is a decisive and integral part of the technical transmission itself. The age-old contradiction between archive and transmission collapses in the delayed present. Before there can be any moments of short-time virtual communities ("crowds", or even societies), data networks consist of distributed sparks of ultra-short retentions and protensions.

Signal run-time as acoustic media archaeology

There is a privileged affinity between "the larger gestals of auditory temporality"[127] on the phenomenological level and the processual being of technical media. Here, time-critical moments parallel the most frequency-sensitive ("rhythmic") sense organ within the human which is hearing.

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126 As stated in the lecture given by Jussi Parikka (Winchester School of Art), Of Queues and Traffic: Network Microtemporealities", at the symposium *Digital / social media and memory*, University of Glasgow, April 17th, 2013

127 Don Ihde, Listening and Voice. Phenomenologies of Sound [*1976], Albany, NY (State University of New York) 2007, 87

If a movie camera or projector is driven manually like in the vera early days, it turns out the visual perception is much more tolerant to slight temporal deviations. This is different with auditory signal replay. Let me illustrate this by a short audio-visual argument produced by the Media Archaeologal Fund at Humboldt University:

begin § cSOUND-ARC-AARHUS / To what degree does the historicity of sound depend on its material embodiment?

"Is the sound of an existing Roman era bell dating from the third century a more ancient sound?", the artistic media archaeologist Paul DeMarinis asks. "For this to be the case we would have to think of the bell itself as an encoding of some 'sound'; that sound, in turn, would have to include the splashing of the molten brass, the beating by smiths' hammers etc. But the sound the bell produces in its current use is far from being a recording of these sounds"

- and rather co-originary sonic production.[128]

Phonographic "engraving" on the contrary is sound in latency. The ontological status of recorded sound is waiting to be activated (German "in-Vollzug-Setzung"), that is: to become medium. This corresponds with the Heideggerean "beeing-in-time". "Heidegger does not mean by essence (*Wesen*) *what* something is, but how it comes to presence (*wesen*, a verb)."[129]

This can be correlated with the temporal "window of present" of musical experience which itself corresponds with micro-temporal actions within both primary phyics and derived technologies.[130] The conflict between the physically impossible ideal sinus wave in Fourier Analysis and its transient *momentum* as an actually physically performed tone epistemologically resonates. / end cSOUND-ARC-AARHUS

The sonic present

In geometrical perspective, the present moment approaches the extensionless *punctum*. In electronic epistemology, what looks like a particle is in fact a high frequency motion, mathematically expressed by the wave equation. The concept of *micro-tones* corresponds with micro-temporalities in the media-archaeological sense. In fact, "tones" are in the frequency realm what is the reverse of a time function (the sonic wave).[131]

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128 Paul DeMarinis, According to Scripture [*2002], in: Ingrid Beirer / Carsten Seiffarth / Sabine Himmelsbach (eds), Paul deMarinis. Buried in Noise, Heidelberg (Kehrer) 2010, 247-252 (247)

129 Kathleen Wright, The place of the work of Art in the Age of Technology, in: Martin Heidegger. Critical Reassessments, ed. Christopher Macann, vol. IV: Reverberations, London / New York (Routledge) 1992, 247-266 (264, note 2)

130 See Joachim Klose, Die Struktur der Zeit in der Philosophie Alfred North Whiteheads, Freiburg i. Br. / München (Alber) 2002, 358 ff.

131 See Curtis Roads, Microsound, Cambridge, Mass. 2004

cAKUSONIK / Discrete Cosine-Transformation encodes complex, time- or space-variant signals into a series of discrete frequency components. "They can be added together to reconstitute the original signal during decoding. Nearly all video codecs transform spatially extended images into sets of simple frequencies" <Mackenzie 2008: 51> - a form of implicit "sonification", and thereby time-critical: "This allows them to isolate those components of an image that are most perceptually salient to human eyes" <ebd.>. At first glance this "sonification" appears counter-intuitive: "In what way can a videoframe be seen as a waveform?" <ibid.> A notion of implicit sonicity emerges: the emancipation of sound as temporal form from physical acoustics, a different musicality.

begin cAKUSONIK / "Sound is not static, it is first and foremost vibrations, and secondly it is friction that causes sound to be heard"[132] - the friction between different physical elements. This is *actually embodied* in the piezo-electric effekt, when a voltage is applied to a crystalline surface and induces a shock wave.

Sonicist thinking is practicing a non-historicist time reasoning; like laboratory experimentation it is "[...] repetition, repeating a note, a thought, at a different moment, a form of tuning". Tuning itself "is a specialized and active form of listening, a type of auscultation, the act of listening to the strings and relationships between keys in the piano."

In McLuhan's sense, "acoustic space" - beyond the age of printed knowledge - is characterized by its non-fixity - "[v]ersatile and vibrating thoughts that do not rest to stay [...]." Hight-technological media share with sound its mode of existence-in-time: they exist only in sonorous performance respectively technical operativity.

"One form of investigation can be through the use of sonic metaphors [...] that have a direct and literal connection to sound such as the following : echo, resonance, vibrato, reverberation, etc. To listen is to be signalled by and then to follow the resonance or echo in the subject that has been chosen."

Another form of sonicist investigation is "to examine the pauses, the rests, and the silence". Different from cultural poetics and aesthetics (John Cage), technological silence signals a differential articulation. Speaking a silence, or letting silence speak, is practice in communication engineering since telegraphy and type-writing (and printing) with the empty "space" key. In the binary alphabet, the "off" counts as much for information as the "on". Thus speaks media-archaeology.

II RE-PRESENGING THE PAST

The material and logical conditions under which present-in-the-past can be "re-

132 Tisha Mukarji, Auscultation (2009); http://www.sonicthinking.org/auscultation.html; accessed February 16, 2010

presenced" are central to media archaeology indeed.[133] As long as it is not being supplemented (or merged) with a optical perception, the perception of a bodyless voice from the past leads to an essential lack of the sense of origin. The absence here is the phenomenal dissimulation of the materially embodied signal (re-)production in favor of the signal as affect, a kind of re-enactment "through a transhistorical *operative practice*" <324> which correlates with Heidegger's reading of ancient Greek techné: "a 'revealing' that not only 'brings forth' but also *makes present*" <324>.

RESONATING "HISTORY"

Media-induced shock more general

The traumatic implosion of an electronic image (as in the case of the last transmission a public speech by Ceaucescu in Rumania December 1989[134]) is of a different kind than the disruption of a celluloid film. Recently, the break-down of Greek state radio and TV broadcasting by a sudden government decision to close down the stations for budget shortages resulted in a technologically induced shock: "It is quite an experience as Silence and Black reigns on public Greek media. In TV it was much more dramatic because the closure had already been announced and there were theatrical countdown moments when the frequency was shut down."[135] Indeed, the visual shock of abruptly finishing broadcast is of a different kind than the acoustic experience.

"Shock" with Benjamin

Human perception is shaped by the variant media conditions. In a way close to what Marshall McLuhan later termed "the medium is the message", Walter Benjamin interprets film not in its content but rather as a setting just like a physiological experimental laboratory.[136] The dramaturgy of "choque" accommodates the audience on the perceptual level to the speed of modernity and time-critical moments. What escapes the imaginary (the cinematographic screen and its illusion of flowing movement), is subliminally perceived as a fragmented series of 24 frames per second, involving a permanent affective / cognitive dissonance on the non-discursive level already..

"Where Hegel considers the process of digestive remembrance to be the interiorization of the past (*Er-Innerung*), Benjamin associates involuntary memory with a contrary exteriorization of the self that explodes the confines of

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133 Sobchack 2011: 323

134 See Peter Weibel, xxx; Harun Farocki / Andrej Unija, xxx

135 E-mail communicaiton by Konstantinos Vassiliou on August 13, 2013

136 "Das Publikum fühlt sich in den Darsteller nur ein, indem es sich in den Apparat einfühlt. Es übernimmt also dessen Haltung: es testet." Walter Benjamin, Das Kunstwerk im Zeitalter seiner technische Reproduzierbarkeit [*1936], Frankfurt/M. (Suhrkamp) 1963, 26

its private interiority. The `disorder' of this anarchic *Bildraum* (which, if spatial, is anything but homogeneous) dislocates the orderly `gallery of images'."[137]

Walter Benjamin coined the term "physische Chokwirkung" for the cinematographical image.[138] Different from the photographic *punctum* (Barthes), the traumatic moment in the filmic image is its temporal movement-thus closer to the phonographic voice. Whereas an image can be motionless endurance, a recorded sound can not but dynamically unfold - between the temporal now ("the present") and auratic appearance ("presence" and "re-presencing").

In his notorious essay on "The Work of Art in the Age of Reproduction" (1936) Walter Benjamin identifies a loss of aesthetic "aura" which is bound to tradition and the uniqueness of the work of art in space and time by means of technical reproduction (mainly photography, but as well phonography, influential up to Baudrillard's notion of simulation. Furthermore, Benjamin sees human perception shaped by the variant historic media conditions. In a way close to what Marshall McLuhan later termed "the medium is the message" he interprets film not in its content but rather as a setting just like a physiological experimental laboratory, when stating that the audience is subjected by the apparatus into a psycho-laboratory *test* situation.[139] The dramaturgy of "choque" accommodates the audience on the perceptual level to the speed of modernity and time-critical moments, as expressed in Ernst Jünger's writings on photography.

The anachronistic momentum of technological recording

Woody Allen's film *Zeelig* operates with digitally interpolated past as fictitious testimony. Unlike the Barthean "punctum" in photography, the anachronism is not imbeeded in the recording itself any more.

The time-critical moments of *mémoire involontaire* in Marcel Proust's *A la recherche du temps perdu* which look contingent can be neuro- and media-archaeologically "grounded". The reanimation of phonographically un-dead sound recordings falls short from the theological notion of redemption; so let us not be trapped to follow a hidden "messianic" eschatology masked by so-called media archaeology. With any re-play of an old phonographic recording of Caruso's voice, history-defying short circuits presuppose that the mechanical and electromagnetic rules known to the designers of sound recording devices are still in operation today. Indeed, the phonographic record allows for time axis manipulation against the physical and cognitive law of the irreversibility of history. "New media, as vehicles that carry our senses and bodies across the

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137 Irving Wohlfarth, "Benjamin", xxx, 189

138 Walter Benjamin, Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit, in: same author, Illumination, ed. S. Unseld, Frankfurt/M. (Suhrkamp) 1969, 148-184 (172)

139 "Das Publikum fühlt sich in den Darsteller nur ein, indem es sich in den Apparat einfühlt. Es übernimmt also dessen Haltung: es testet." Benjamin 1936 / 1963: 26

space-time continuum, introduce to us old modes of experience [...]. Media thus bear the messianic power, in Benjamin's special sense of that word, to forever alter the past."[140]

The Edison phonograph did not arise from desire for a memory medium. In fact it rather unintentionally resulted from Edison's experiments in speeding up transmission of telegraphic signals, recording the Morse code dots and dashes on an intermediary storage device (the embossy telegraph with rotating discs) for accellerated transmission: "[...] to make a repeater that would store words without the labor of the human hand [...]"[141]

- just like the draughtsman Henry Fox Talbot developed photography from his wish for images from nature to be liberated from the inaccuracies of his painterly hand.

If for this reanimation of dead sounds and images the word "redemption" might be applied, this is not simply a reference to Walter Benjamin's "messianic" historical materialism; we might phrase it rather the other way round: Benjamin's phrasing is now itself redeemed by technical media of suspended time.

Sonic "immediacy": Dissimulated presence

The term "presence" expresses the subjective perception of non-mediation in media participation[142] as known from traditional rhetoric as the figure of hiding the awareness of artificial speech configuration *dissimulatio artis*. When a voice from phonographic record is being re-played, both the technicity of the apparatus and the historicity of the actual recording are being forgotten in favour of the physiological a/effect of presence. In the words of Bolter & Grusin and developing on McLuhan's *Understanding Media*, such *immediacy* is a "style of visual representation whose goal is to make the viewer forget the presence of the medium (canvas, photographic film, cinema, and so on) and believe that he is in presence of the objects of representation"[143] - whereas *hypermediacy* actually emphasizes the presence of the medium and does not dissimulate it in favour of the impression of using a previous (familiar) one - just like modernist painting, according to Clement Greenberg, is defined by making the carrier medium itself the aesthetic message. This immediacy, for the sonosphere, is of a specific kind, since the sonic affect of presence is no representation at all.

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140 John Durham Peters, Helmholtz, Edison, and Sound History, in: Lauren Rabinovitz / Abraham Geil (eds.), Memory Bytes. History, Technology, and Digital Culture, Durham / London (Duke University Press) 2004, 177-198 (195)

141 Peters 2004: 188

142 As defined by Wulf Kansteiner in his lecture on "Interacticity, Immersion, and Historical Consciousness" at the Glasgow Memory Group symposium *Digital/Social Media and Memory*, April 17th, 2013

143 Jay David Bolter / Richard Grusin, Remediation. Understanding New Media, Cambridge, Mass. / London (MIT Press) 1999 2000, 272 f.

THE TECHNO-SONIC. How does sonicity affect and irritate human time consciousness?

Analysis of the "sonic"

"But what is a historic present if not a present that can be successfully archived?"[144] The analysis of the "sonic" is based on the tight alignement between the unrepresentable Lacanean real (as equivalent to traumatic experience) and sound, especially the physiology of the voice.[145]

What has not been recordable in alphabetic writing (even if symbolically intended but the explicit introduction of single letters representing vowels in the early Greek alphabet[146]) is the physics of the voice which can be recorded only in the gramophonic signal. "What defies literary memory is approachable only by means of nonliterary media. "[147]

If the present has been considered an inevitably fugitive, uncapturable time momentum for the longest time, the human voice especially has embodied and allegorized this "fugit tempus" experience of presence. An early newspaper article announcing the invention of the gramophone disc by Emile Berliner starts with the remark that volatile speech has finally been "imprisoned" by the new recording technology, making it not only repeatable for aesthetic or bureaucrativ used, but accessible to scientific speech analysis on a micro-level of formation which - different from the human physiological options of memorizing delayed presence - only measuring media can capture, register and thus keep for time axis manipulations. On the darker side of this widening of research topics for humans, with this option goes the traumatic experience that the voice can be preserved as a "dis-embodied" event. Thus it has got into the focus of communication engineering, psychoanalytic and historiographical analysis, particularly in its capacity to engender a sense of heightened presence (as compared with written records).

Audio signal archives emanate from chrono-technological recordings; their specific feature is the power of "re-presencing" (Vivian Sobchack) the sonic event.[148]

Husserlean and Aristotelean time: Sonic "rhythmograms" vs. discrete clocking

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144 Doane 2002: 105

145 On Lacan's definition of the voice, see Mladen Dolar, The Voice and nothing more, xxx, 2006, chap. 6 ("Freud's Voices"), subchapter "silence": 152-161

146 See Ernst / Kittler (eds.) 2007

147 Pinchevski 2012: 156

148 For a discussion of Janet Cardiff's audio walk *Her Long Black Hair* (2004) as aural re-presencing, see Barker 2012: 20

Serious engagement with sonicity – with sound being understood as time signal event – opens access to a plurality of non-narrative temporalities which even subverts the apparent cultural-historical context of sound perception, production and consumption.

The rhythms which structure perception in the human brain can not immediately be consciously perceived.[149] Therefore a direct sonification of alpha waves in the brain is required.

An early advertising for the Bulova Accutron Space View watch announced "The Tick vs. the HUM". But even if "the hum" sound is smoothly "analog" and thereby coincides with human world experience and the notion of the "flow of time", the mechanical "tick" is (as remarked by Fourier) just an extreme discretisation of the very same vibrative event.

According to Edmund Husserl[150], time is "a stream of experiences with an infinite chain of *now*-points <temporal> (impressions), each of them surrounded <...> <embedded> by a retention (a now-point just passed) and a protension (an expectation of a now-point which is still in the future but which becomes a now-point in the present"[151].

This approach sets subjective time sensation apart from the "clocked" time of the Newtonean universe (for classical physics) and "breaking news" (in broadcasting media). Media archaeology as method couples Husserl's diagnosis *tightly* with technological and archival knowledge. "Data Retention" in fact is a term precisely known from static storage within the computer to ensure that the data in an elementary cell will not be altered. The Static Random Access Memory (SRAM) must be supplied by a power supply that will not fluctuate beyond plus or minus five to ten percent, in order not to disturb the elementary cell and to ensure that it will correctly keep the data. "In that case, the SRAM is set to a retention mode when the power supply is lowered, and the part is not longer accessible."[152]

The central terms in the Husserlean phenomenology of the "inner" time sense, retention and protension, is subjective in an objective way: both neurologically, technologically and epistemologically. The archive reminds that predictive calculation has been the central temporal figure which gave birth to what was soon to become popular under the name of "cybernetics" which, as the eponymous Norbert Wiener frankly admitted in the introduction to his seminal

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149 "[...] nehmen wir diese messbaren Signale mit keinem unserer Sinne wahr": Hinterberger 2005: 284

150 Edmund Husserl, Vorlesungen zur Phänomenologie des inneren Zeitbewußtseins [*1928], ed. Martin Heidegger, 2nd ed. Tübingen (Niemeyer) 1980

151 As paraphrased by K. R. Eissler, The Psychiastrist and the Dying Patient, New York (International University Press) 1955, 272; quoted here after Hartocollis 1983: 4

152 Integrated Circuit Engineering Corportation, chap. 8 (SRAM Technology), 8-4 = Smithonian - The Chip Collection (http://smithonianchips.si-edu, accessed May 2014)

Cybernetics of 1948, originated in the necessity of World War II anti-aircraft artillery to anticipate the immediate future moves of enemy planes for computing the point in space and time where both the anti-aircraft gunshots and the enemy aircraft meet: "[...] that missile and target may come together in space at some time in the future."[153] This mathematics becomes media technology with the necessary implementation of pre-emtive calculation into a servo-mechanism which performs negative feedback correction of its on-going positioning of the artillery gun in *real-time*.[154]. This "window of the present" is time-critical in its most deadly sense and thereby does not that much refer to "live" transmission of radio signals but rather to "life" in its limited time span in combat. Together with Julian Bigelow, Wiener was involved in the "investigation of the theory of predicitons and of the construction of apparatus to embody these theories"[155].

The age of storability of voice and sound has already created its very retro-action (or "counter-archive", in a variation of Paula Amad's interpretation of Kahn's *Archives de la Planète*): Sergiu Celibidache as concert director was radically opposed to phonographic "conservation" of music (which is - as discussed by Adorno - an effect of phonographic recording); he favoured the "now".[156]

There is a specific "sonic" temporal quality of the present which is always already instantaneously transforming *passing* (French *passer*) into *past* (French: *passé*), in French phonetically undistinguishable, resulting in *passé(r)*.

[Only with phonographic recording, such a presence becomes repeatable, thus an experience of enduring presence.]

The alternative to acoustic communication which is periodic propagation of continuous waves (which itself, as frequency reversal, turns out to be countable) is the "digital", discretizing approach: Aristotle in book IV of his *Physics* (219b 1-2): *touto gar estin ho chronos, arithmos kineseos kata to*

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153 Wiener 1948/49: 11. For a different approach to the same challenge see Claude Shannon's involvement in the Cold War Nike anti-missile-program, as reported in Axel Roch, Claude E. Shannon. Spielzeug, Leben und die geheime Geschichte seiner Theorie der Information, Berlin (gegenstalt Verlag) 2009

154 Wiener describes the "mechanico-electrical system which was designed to usurp a specifically human function - [...] the execution of a complicated pattern of computation [...] the forecasting of the future": Wiener 1948/49: 13 (quoted here after Becker 2012: 226)

155 Norbert Wiener, Cybernetics. Or control and communication in the animal and the machine, New York / Paris (Technology Press) 1948/49, 13, quoted here after: Rainer C. Becker, Black Box Computer. Zur Wissensgeschichte einer universellen kybernetischen Maschine, Bielefeld (transcript) 2012, 226

156 Thilo Hinterberger, Kommunikation mit Signalen aus dem Gehirn, in: Barbara Könches / Peter Weibel (eds.), unSichtbares. Algorithmen als Schnittstellen zwischen Kunst und Wissenschaft, Bern (Benteli) 2005, 262-285 (284)

proteron kai hysteron.[157]

Frequency *versus* oscillation recalls "duration" in Bergson's sense.[158] There is a remarkable "timelessness" (the Nietzschen "eternal return of the same") in periodic processes which can be addressed as frequencies, as demonstrated with one's perception of the movement of a pendulum clock. When visually following the dial of a clock, nothing is left of the past positions.

"Within myself a process of organization or interpenetration of conscious states is going on, which constitutes true duration. It is because I *endure* in this way that I picture to myself what I call the past oscillations of the pendulum at the same time as I perceive the present oscillations."

A tuning fork, coupled to an electro-magnetic coil (as developed by Hermann von Helmholtz in reverse functionality as electro-mechanic device to measure the micro-temporal run time of nerve impulses[159]), provides the time base in the Bulova *Acutron* watch. The stroboscopic microscope is able to visualize the movements of a tuning fork-based clock developed by the Bulova company.[160]

"The kind [sc. of clocks] that tick work on balance wheels, hairsprings and wachtworks. And that's what can make them work wrong. The Accutron timepiece <...> hums. (Musically, between E and F but above Middle C). Accutron opertes on the precice vibrations of an electronic-powered tuning fork. Each vibration splits the seconds into 360 equal parts and Bulova can guarantee accuracy to within on eminute a month. That's am average pf 2 seconds a day."

In digital computing, this is matched by the Japanese *Parametron* based on resonant circuits. / end cSCHWINGSON

A sine tone here serves as time-giving media event - not for acoustical or even musical sake, but in implicit sonicity: the tempor(e)ality of sound which is shared by processual technologies. The second-indicator does not visibly move abruptly like in the escapement-driven mechanical clock, but almost moves continuously - just like above the haring threshold of ca. 20 hz the human mind can not discreminate between discrete acoustic impulses any more but perceives a continuous tone, even it this tone still consists of oscillating waves (sine / cosine, discretely passing the "Nullpunkt"). Here, two kind of realities overlap: the media-archaeological and the phenomenological one.

„Presence“ in audio technology

By software-based motion tracking it can be micro-analyzed that the performative motion anticipates the actual tone which corresponds to Husserl's

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157 See as well Arist. Phys. II, 192 b 21

158 The concept of "rhythm" as interlacing of both discrete (digital) and continuous (analogue) termporality is discussed in Ikoniadou 2014, 7 f.

159 See Helmholtz 1863

160 See http://www.richardkunze.de ("Faszination Stimmgabeluhren")

notion of the "time window" of melodic presence in neuronal pro- and retention.[161]

Different from the originality of a work of art in photographic reproduction (as described by Walter Benjamin), the *aura* of physical sound can digitally remain intact in its essential feature which is temporal integrity. Matter can not be digitally reproduced, but movement and sonicity - thus not loosing its tempAURAl quality.

"Presence" in sound engineering is the term for the degree of clarity in instrumental and vocal sound, which can be increased by use of the Equalizer within the frequency ranges of around 18 Hertz to 16 kHz.

"In an amplifier, a presence control controls "presence". A presence control boosts the upper mid-range frequencies. Thus by increasing the presence with the presence control, the sounds of voices and such instruments seem more 'present'."[162]

Remarkably, the audio-technical term *presence* is attached to the voice (or instrument) here.

The voice is perceived as indexical testimony of presence on the one hand, and its irritation (subverting testimony) on the other when re-played from phonographic recording.[163]

„On television production studio's sound desk, there can be several presence controls, for several different, switchable, frequencies. <...> If the degree of mis-match between microphones is great, simply increasing presence is not enough, and instead a sound engineer will use a graphic equalizer, sometimes several, each connected to an individual sound channel“ <Wikipedia op. cit..>

- an operative diagram.

„Presence controls can also be found on electric guitar amplifiers. The first presence control on a Fender amplifier <...> appeared in 1954 on the Twin. [...] The original Fender presence control acted upon the amplifier's negative-feedback loop." <Wikipedia op. cit.>

Micro-archiving sonic presence with technologies

Technical recording of sound is a process of storage. "The breaking of the time

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161 See Rolf Inge Godøy, Marc Leman (eds.), Musical Gestures. Sound, Movement, and Meaning, London / New York (Routledge) 2010

162 From the online encyclopedia Wikipedia: http://en.wikipedia.org/wiki/Presence_%28amplification%29; accessed September 3, 2013. See Rudolf F. Graf, entry "presence control", in: Modern Dictionary of Electronics, Newnes 1999, 586

163 See Doris Kolesch / Sybille Krämer, Stimmen im Konzert der Disziplinen, in: same authors (eds.) 2006: 7-15 (7)

constraint has profoundly changed the nature of acoustic communication."[164] The temporality (and volatile being-to-death) of sonic articulation which hitherto could only by recorded symbolically by mnemonic notation is transformed into space and visualization by the very act of recording, making it available for analysis "outside of time" <ibid.>. The temporal essence of sound is thereby turned into a reified, objectified time object, from evanescence to the ob-scene.

The traditional sound record - like the textual record - can be included within an institutional archival frame. With digital sound, though. literally every bit of sonic articulation becomes part of a generalized "archival presence", since a) every digital signal processing involved ultra-short quasi-archival intermediary storage and b) every sound "bit" becomes numerically addressable and thereby accessible to mathemtical / algorithmic manipulation. The archival frame is deconstructed and re-turns from within the digital archival records themselves. From analog to digital "archiving" sonic presence, "the manner of storage determines the kind of control that can be exercised over it" - from manipulation to distortion <Truax 1984: 119>. At the same time, the analog-to-digital conversion results in a transsubstantiation of the audio signal: from the primary physical event to information which is essentially neither energy nor matter. Thereby the signal loses its indexical trace; transitive transduction is therefore to be set into quotation marks: "[...] the digital 'transduction' process includes the digitalization of the analog signal by the ADC, its <micro->storage and / or manipulation in binary number format, and its reconstruction as an anlog signal by the DAC" <Truax 1984: 139> - which is the conversion of an electronic representation (embodiment?) of a number stored in the computer memory to discrete voltage steps at fixed time intervals (D*t*). The physically continuous original waves are thus transformed into quare waves; in fact every binary computational act is an abrupt form of oscillation between zero and one in a time-sequential form. Only by smoothing the square wave by filters the wave becomes continuous again.

Sonic Media Tempor(e)alities: From Analog to Digital

The primal scene (Freudean *Urszene*) of affective irritation of "presence" has been the moment when the human voice which has represented the most transient articulation of presence for ages (since Plato's criticism of writing until the deconstruction of occidental logo-centrism by Jacques Derrida) phonographically could be stored and re-played even beyond the dead of the voice-bearer. The working assumption of the Berlin Team research is that Edison's invention of 1877 which allowed for not just symbolical (phonetic writing in vocal alphabet) but physical (the acoustic signal) recording of the dis-embodies individual voice has been a cultural shock which - although it soon became part of everyday sound culture - has still not been digested within the cultural unconscious. What seems natural to an animal (the notorious dog Nipper listening to "His Master's Voice" at the gramophone tube) for humans leads to a traumatic dissonance between cognitive knowledge (the historicity

164 Barry Truax, Acoustic Communication, Norwood, N. J. (Ablex) 1984, 117

of the recording) and neuro-physiological affect which perceived the gramophonic voice as pure presence (Dolar).

When the father of *musique concrète* in Paris Pierre Schaeffer defined the acousmatic[165], he re-used a term once coined to describe the teaching method of Pythagoras who concentrated ("heated up", in McLuhan's terms) on the human audio channel of communication by hiding behind a veil (or in a cave) while speaking. This acoustic purism is truly archaic in the media-archaeological sense: letting the pure, disembodied voice emanate while the sound-generating human or machine is hidden. For the listener it is undecidable whether there is human presence, radio transmission or a gramophone record behind the veil. Thereby the visual absence of the sound source does not only refer to space but to temporal irritation as well. An ongoing (even apparently accommodated) paradigmatic shock took place since the invention of the phonograph (and the answering machine), when all of the sudden the voices of the dead could be heard again in re-play: acousmatics in (flat, close to the present, or deep, "historically" distant) time. In addition, there is an additional micro-temporal dimension of acousmatics. Irritation of acoustic perception takes place even when a corresponding visual source can be noticed but is not synchronized with the acoustic event (well known from problems in lip synchronisation in sound film).

cSONICTIMES-MAIN / The voices and sounds emanating from such a black box are radically bodyless, resulting in a different timing than the symbolical historio-graphical time. This split between an original sound and its electroacoustical recording results in what R. Murray Schafer called "schizophonia" - a dissonance between the affective and the cognitive awareness of sound-based time consciousness.

A special emphasis is put on the analysis of the digitization of "sonic" media archives in its wider sense - with "sonicity" here being used in a neo-logistic way as a category of time-related objects of knowledge, referring to the range of time-based media which are sonic in the sense that electro-mechanical and high-electronic operations share with acoustic events their radical temporal condition. While archives of visual evidence (photography, cinematographic frames) represent a static archive (endurance), the "acoustic space" (McLuhan) of recorded sound and electric circuits stands for processual temporalities. While on the level of user interfaces the digitization of sound sources from the analog archive is mostly unnoticed in the everyday media practice, it is of utmost importance to point out the deep rupture which sublimely takes place when qualities like anlog "live" transmission is being replaced by "real time". Such calculations create ultra-short intermediary archives which look like presence in the narrow time window of what physiologically counts as presence. In addition, the authenticity of the indexical signal is being challence once it gets processed digitally. Acoustic, oral and even musical experience within that context serves as a privileged field for analysis. Ironically, by analog-to-digital conversion ("sampling") the symbolical code (previsously represented by the textual alphabet) returns in mathematical forms (alphanumeric algorithms), asking for a refreshed grammatology of the theory

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165 Pierre Schaeffer, Traité des objets musicaux, Paris (Seuil) 1966, 91

and practice of "archiving presence".

Digital sampling troubles the human ears by making it a player in the sonic *imitation game*:

"Drum or keyboard sounds stored on a digital music computer can be triggered by analogue recordings. <...> a 'real' drummer, playing with human imperections, can be made to sound like a machine. [...] this technique has been consolidated into a piece of hardware called *The Human Clock* - a triggering device that enables a drummer to drive machines in synch, according to a varying human tempo."[166]

This results in "confusions" - at least irritations - "between human and automated rhythm" <265>, culminating in a metaphysics of the analogue: "This sense that analogue is warmer and more natural than digital also extends to its visual signification, <...> signified via the words we use to describe these patterns - *waves* as opposed to *numbers*" <265> - or pulses. *Presence* is<t> "crucially, a *musical* as well as an iconographic term."[167]

Digitization of "archived presence" does not only requiry a very close reading of its impact on micro-temporal operations but might result in a re-definition of the *Archive in Motion* itself.[168]

The affordance of some types of phonograph / gramophone / magnetophone one the one hand (in the Berlin Media Achaeological Collection) and of software and computing competence on the other (in the Berlin team Signal Laboratory), will allow for the experimentation of these media-archaeological questions and theses.

cHUBSCHRIFTGUSLARMPC / While mechanical sound recording directly corresponds with (and to) the mechanical vibrations of the Gusle string and the Guslari voice, magnetic recording requires the intervenence or a literally technical "medium" which is the apparatus of electro-magnetic induction. The wire recorder, by its very recording medium (a steel wire), directly corresponds with the telephone line - thus allowing for a kind of direct transmission of recorded songs from storage to presence: "re-storing presence".

cSONICTIME / The sonic time sense in humans clearly observes what Roland Barthes has analysed for lightning-like momentum (*punctum*) of a photography from the past which (nothwithstanding its intellectual cognitive *studium* which refers to its contextualisation in history) rather indexially (the chemical fixation of light traces) than metonymically (rheotrical narrative) links the past to the present spectator: "Ca a été", the affect of a presence in absence, a kind of

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166 Andrew Goodwin, Sample And Hold. Pop Music in the Digital Age of Reproduction, In: Simon Frith / same author (eds.), On Record. Rock, Pop and the Written Word, London (Routledge) 1990, 258-274 (264)

167 Goodwin 1999: 269

168 See Eivind Røssaak (ed.), The Archive in Motion. New Conceptions of the Archive in Contemporary Thought and New Media Practices, Oslo (Novus) 2010

negative ontology of presence.

- Instantanous "affective consciousness" when viewing a photography has been indentified by Roland Barthes.[169] In fact, most of such studies relate to the visual regime (writing, printing, visual evidence), whereas the current research project (thread Ernst) concentrates on what Marshall McLuhan once termed the "acoustic space".

Sound pulses human / inhuman: Heart beats as affect of life

The human ear perceives kinetic impulses (the acoustic waves) rather affectively than consciously: "Not because I count `one´ to a tone [...] do I know that I am at the beginning of a measure, but because I feel that, with this tone, I have reached the wave crest and at the same time have been carried beyond it, into a new wave cycle"[170] In current ultra-sonic monitoring of the heart beat of yet unborn humans by Cardiotocography, the actual registration sounds like the mechanical rotations of an early Edison phonograph cylinder. An gramophone recording of a human heart beat produced for medical use in 1931, in the German Broadcast Archive (Deutsches Rundfunkarchiv) has been actually catalogued as "Geräuschaufnahme" - as recording of noise.

Media-based figures of time define life as a function of pulsating rhythms. Not the technical frequencies are being evoked (that would be electro-magnetic radar pulses) but human presence as represented by heart beats - imprisoned in many senses. The human heart turns out to be an archetypal case of the acousmatic dispositive; while it can heard it can not be naturally seen. The chest has to remain closed in order to constitute a space of resonance for the heart beats.[171] In a dissimulative disguise of sonic technologies, non-invasive real-time ultrasound imaging in the medical context gives renders the phantasmagoric impression of actually "seeing" inside the body, while its visuality is a techno-mathematical transformation of ultra-sonic impulse responses. Appropriately, one of the earliest applications of sonic signal transduction into visual representation has been called *Hyperfonografie* in 1942 by the neurologist Karl Dussik.

What literally "counts" here is neither the sonic event nor its imaging procedure, but the run-time of the signal from which shapes of reflecting matter is computationally derived. Next to the Homeric Sirens, the mythic nymph Echo becomes media-archaeologically grounded in echokardiography which is based on the impulse-echo-procedure.

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169 Roland Barthes, Camera Lucida, London (Vintage) 1993, 55

170 Victor Zuckerkandl, Sound and Symbol. Music and the External World, Princeton (Princeton U. P.) 1956, 204f. This argument is being discussed in John Sheperd / Peter Wicke, Music and Cultural Theory, Cambridge / Oxford (Polity Press) 1977, 132ff

171 See Walter Filz, Herzarchiv. Oder: die Poesie der Dokumente, in: Verein für Medieninformation und Mediendokumentation (ed.), Fokus Medienarchive. Reden - Realitäten - Visionen 1999 bis 2009, Berlin (LIT) 2010, 159-167

The sono-traumatic affect

Presence is no ontological state but an affect of *différance* (Derrida). "Viola's deconstruction of presence leads [...] to the unconscious discovery and experience of time - an essentially traumatic event. [...] This sense of trauma is articulated through the primordial scream that recurs throught Viola's work [...]."[172]

Jonathan Sterne writes on the idea of the resonant (phonography-based) tomb, embalming et al. as the discursive condition which gave rise to sound recording technologies: "Phonographic time was the outgrowth of a culture that had learned to can, to embalm, in order / to 'protect' itself from seemingly inevitable decay."[173] It might be added: this was the epoque of studies in thermodynamic entropy as well. This is the discourse-analytic approach, as expressed in the subtitle of Sterne's monography *The Audible Past*: *Cultural Origins of Sound Reproduction*. Under this perspective, recorded voices did not result in a schock but resonated with an already established discursive condition. But even if sound recording apparently results from a discursive setting within a socio-historical context, the probability does not explain the qualitative rupture which resulted from the sudden being-there of phonography.

modPADERMETH1a / Different from hermeneutic understanding (German *Verstehen* resonates with its acoustic hearing) Joseph Carl Robnett Licklider researched to which extent speech can be distorted and still remain intelligible: "Distortion is most easily thought of as a deformation of a function of time or of frequency"[174] - auf jenem "rather microscopic level on which I want to consider it" <ibid.>,

When it comes to define the location of "the real", Lacan refers to the transient moment of waking up from a dream. His example is decidedly acoustic: a noisy event makes the differnence to the dream, as a little bit of reality.[175]

How is the affect of "presence" respectively "pastness" being achieved in sound

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172 Donald Kuspit, Bill Viola: Deconstructing Presence, in: Barbara London et al. (Hg.), Bill Viola: Installations and Video Tapes, New York (The Museum of Modern Art) 1987, 73-80 (78)

173 Extracts of Sterne 2003 reproduced unter the title "Preserving Sound in Northern America" in: Mark M. Smith (ed.), Hearing History. A Reader, Athens (University of Georgia Press) 2004, 295-318, esp. 308f

174 J. C. R. Licklider, The manner in which and extent to which speech can be distorted and remain intelligible, in: Cybernetics / Kybernetik. The Macy-Conferences 1946-1953, vol. 1: Transactions / Protokolle, ed. Claus Pias, Zurich / Berlin (diaphanes) 2003, 203-247 (203)

175 Jacques Lacan, Die vier Grundbegriffe der Psychoanalyse, in: same author, Das Seminar. Buch XI [1964], transl. and ed. by Norbert Haas, 2nd ed. Olten / Freiburg i. Br. (Walter) 1980, (66). See Jacques Lacan, The Four Fundamental Concepts of Psycho-Analysis (Seminar XI, ed. Jacques-Alain Miller), Harmondsworth (Penguin) 1964

recording / transmission?

cSONICTIME / Only with its implementation in physical vibrations, music as cognitive or symbolically notated concept starts to haptically affect the human sense of temporal presence. From this material implementation emanates the power of phonographic sound recording media to "represence" (Vivian Sobchack) past performances.

Whereas the cinematic format and TV image is always perceived as framed and thus contained (as a kind of quotation mark of reality), the acoustic signal is never minimized but cuts directly, even aggressively into the ear. The radio voice is not perceived as *representation* of the "real" (physically present) but as identical with the human voice itself.

The phonographic Nipper effect: "shocking" logocentrism

In their incubation phase, new technologies get media-archaeological (insteaad of mass-media) attendance.

["When a new technology comes into being and is diffusing <...>, one should be able to <...> arrive at a fuller description of these feedback lops that discursive analysis alone would yield."[176]]

Marcel Proust describes the experience of his grandmother's telephone voice at a time when this electro-acoustic device was still not yet digested into everyday practice and rather perceived as a spectral "medium".[177]

"The voice, separated from its body, evokes the voice of the dead"[178], as exemplified by the narrator in volume three (*The Guermantes Ways*) of Marcel Proust's *In Search of Lost Time* for the case of a telephone talk with the distant grandmother. The affective-cognitive dissonance of experienced nearness in spite of the knowledge of distance results in a gap similar to the affective listening of a musical recording from the past: "A real presence, perhaps, that voice that seemed so near - in actual separation!" <Proust 2001: 419>.

This gap is structurally akin to the central feature of trauma: a non-historicisable affect of presence.

The way Proust seeks to describe the psychic schock induced by the phonographic voice reveals a special aspect of the overall novel theme of *la recherche du temps perdu*: It is impossible to integrate this temporal experience into narrative discourse; one can not symbolically representat real

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176 Hayles 1999: 207

177 Marcel Proust, Auf der Suche nach der verlorenen Zeit [Marcel Proust, Frankfurter Ausgabe, ed. Luzius Keller, Werke II], vol. 3: Guermantes, Frankfurt/M. (Suhrkamp) 199 6, 186. See as well the chapter on "hauntology", in: Simon Reynolds, Retromania. Pop Culture's Addiction to its own Past, London (Faber & Faber) 2012

178 Dolar 2006: 64

signals, "an instant that resists transmutation into discourse"[179]. What can be scientifically described, though, is the micro-eventality of signal transduction from phonographic record and its physiological processing in the human ear, the almost transient identification of the individual speech timbre and its micro-temporal creation of awareness ("presence") in human consciousness.

Instead of "trauma", should we not rather write *chock* in Walter Benjamin's sense? With the Edison phonograph, die auratic uniqueness of the vanishing voice was replaced by iterability (deferred logocentrism, in Derrida's sense). This shock has not yet been digested in the cultural unconscious.

On the one hand, in early phonographic music recording, the signal could hardly be discreminated from the noise of the rotating cylinder. On the other hand, in 1916, an experimental performance in New York's Carnegie Hall directly compared the living singer's voice to her phonographic recording:

cSONICTIME / "Alone on the vast stage there stood a mahagony phonograph <...>. In the midst of the hushed silence a white-gloved man emerged from the mysterious region behind the draperies, solemly placed a record in the gaping mouth of the machine, wound it up and vanished. Then Mme. Rappold stepped forward, and leaning one arm affectionately on the phonograph began to sing an air from "Tosca." The phonograph also began to sing "Vissi d' Arte, Vissi d'Amore" at the top of its mechanical lungs, with exactly the same accent and intonation, even stopping to take a breath in unison with the prima donna. Occasionally the singer would stop and the phonograph carried on the air alone. When the mechanical voice ended Mme. Rappold sang. The fascination for the audience lay in guessing whether Mme. Rappold or the phonograph was at work, or whether they were singing together."[180]

On occasion of an analogous confrontation between vocal human performance and phonographic technical operativity, in the same year the Boston Journal reports: "It was actually impossible to distinguish the singer's living voice from its re-creation in the instrument."[181]

With the phonograph, all of the sudden, the ephemerality of the human voice and musical sound became disposable in a way Henri Bergson criticized for the phonographic illusion of technically capturing movement. Life, as it were, became artifical. Until phonographic recording, the performance of insubstantial musical works had been experienced as akin to the transience of living beings:

"But ever since Edison heard his phonograph singing 'Mary had a little Lamb' in

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179 Paul Frosh / Amit Pinchevski, Introduction, to: same authors (eds.) 2009: 1-22 (8)

180 "Edison Snares Soul of Music", in: New York Tribune, 29th April, 1916, 3

181 As quoted in: Emely A. Thompson, Machines, Music, and the Quest for Fidelity. Marketing the Edison Phonograph in America 1877-1925, in: The Musical Quartely vol. 79 (1995), 132. See Peter Wicke, Das Sonische in der Musik, in: PopScriptum 10 (2008), *online* http://www2.hu-berlin.de/fpm/popscrip/themen/pst10/index.htm

December 1877, he destabilized this metaphor, challenging the uniqueness of any single duration. [...] By fixing a reality, hitherto subject only to direct experience, Edison's invention also apparently fixed the unfolding of time. [...] Sound could now be captured, commodified, and replayed; the passing of time, therefore, could be objectified, recalled, and re-lived; our existence - allied to that of time - could, with the aid of technology, be re-presented indefinitely. Our presence could thus quite literally be re-membered. If families do indeed listen to their deceased relatives, as Edison suggested, they - like Nipper - feel an eternalized presence; this, however, is nothing but the specter of one's remembrance, the flipside of which is that listeners experience the presence of their own mortality: an apparition inscribed as grooves onto a metallic tomb. "[182]

Acoustic signals, once recordable and thus replayable, transformed from an immediate sonic experience ("musical presence") to technically implicit "sonicity".

As has been iconized by the HMV record label *logo* (derived from Barraud's original painting), the dog Nipper literally listens to "His Master's Voice" on his very coffin.[183] The real stays with the corpse (Lacan). For Adorno Nipper in this painting is "the right emblem for the primordial affect which the gramophone stimulated and which perhaps even gave rise to the gramophone in the first place. What the gramophone listener actually wants to hear is himself, and the artist merely offers hm a substitute for the osn diage of his own person, which he would like to safeguard as a possession. <...> Most of the time records are virtual photographs of their owner <...> - ideologies."[184]

The priordial affect of listening to absent voices from phonograph stems from the technological impetus itself. Adorno here folds the two components of the Narcissus theorem into one: the "acoustic mirror" (failing to recognize the audio-visual rupture inbeteween). But in fact Adorno locates the driving "traumatic" force in the technical invention which led to the phonograph in the im/moretality impulse - just like Sterne's subtitle to *The Audible Past* reads: "Cultural Origins of Sound Reproduction". Only with such sound reproduction becomes the past audible in the sense of a "historic" record (literally). But media-archaeological close inspection reveals that is was phonetic research (Léon-Scott) which led to the Phon(auto)graph. There is an autonomous inner-technical logic(s) which leads to the apparatus; its powerful impact in fact derives from the coupling to a discours (the obsession with im/mortality in the Victorian age). "The inside of sound was transformed so that it might continue to perform a cultural function"[185], namely the desire for immortablity. But this confuses the scientific interest in phonography with a cultural discourse.

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182 David Trippett, Composing Time. Zeno's Arrow, Hindemith's *Erinnerung*, and Satie's *Instantanéism*, in: Journal of Musicology 24 (2007), 522-580 (538)

183 See as well "Prayers of a Phonographic Doll", online: http://forums.ssrc.org/ndsp/2014/01/29/prayers-of-a-phonographic-doll (accessed August 2014)

184 Theodor W. Adorno, as quoted in the extracts from Sterne 2003 in: Smith (ed.) 2004: 306

185 Sterne 2003, as reproduced in Smith (ed.) 2004: 306

While historiography refers to times past which are by definition absent, audio-visual signal recording in fact creates repeatable presence. While symbolical historiography semiotically refers to an external temporal referent, signal recording keeps presence in latency which is a different category of technical and psychic time. While the status of the witness in terms of historical research is clear, media audiences are not simply recipients of someone else's testimony[186] but by the very electro-magnetic nature of live transmission (and its recording) actually become witnesses in repeatable event space. The non-decidability for human spectators between "live" and recorded sound & image leads to a kind of temporal Turing test (not of "intelligence", but of the "time sense"): Recorded past or actual present? This is not derived from a traumatic experience, but leads to a traumatic irritation of the human sense and metaphysics of "presence".

The role of the IBM computer in the *Jeopardy* quiz and in the film *Desk Set* reminds of the classic "Turing test" (now famous from the movie *The Imitation Game*). Traumatic affects or schocks induced by technology itself differ from trauma studies which are related to historical events. The human/machine difference worked well as long as Descartes could separate body-automata from the soul, but got more irritating when it came to experiments in artificial intelligence.

Audio recording on magnetic tape allows on the signal level what Turing designed for symbolic operations on paper: "Like the phonograph, audiotape was a technology of inscription, but with the crucial difference that it permitted erasure and rewriting."[187] In 1962 William Burroughs published *The Ticket That Exploded* describing visionary technologies inspired by magnetic recording.[188] "[I]t was a startling discovery to learn that one's voice could be taken out of the body and put into a machine, where it could be manipulated to say something that the speaker had never heard before."[189] As assumed by Arnold Gehlen[190], this is exactly what defines the human different from other animals that he/she is orignary lacking completion, that is: always already coupled to symbolic or other forms of supplementation, therefore: always already non-human as well.

The vocal apparatus actually produces subvocalization during silent reading - the implicit phonograph.[191] This subvocalization is not only essential to the

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186 See Paul Frosh, Telling Presences. Witnessing, Mass Media, and the Imagined Lives of Strangers, in: Frosh / Pinchevski (eds.) 2009: 49-72

187 N. Katherine Hayles, How We Became Posthuman. Virtual Bodies in Cybernetics, Literature, And Informatics, Chicago / London (University of Chicago Press) 1999, 209

188 William Burroughs, The Ticket That Exploded, New York (Grove Press) 1967, chapters 9 and 10; see as well same author, Electronic Revolution, Bonn (Expanded Media Editions) 1970

189 Hayles 1999: 207

190 Arnold Gehlen, Die Seele im technischen Zeitalter. Sozialpsychologische Probleme in der industriellen Gesellschaft, Reinbek b. Hamburg 1957, esp. 7 f.

191 See Garret Stewart, Reading Voices: Literature and the

production of literary language but is a reverse engineering of the origin of the phonetic alphabet itself which introduced discrete vowel letters for recording the musicality of Homer's oral poetry.[192]

Poulsen's patent description of the Telegraphone[193] points out that signal recording differs from alphabetic writing in being a different, non-symbolic inscription: graphical sound. Once vocal sound is no longer symbolically situated in the vowel characters of the alphabet but as signals in the machine, it can no longer be represented within the world of the text. The technological qualities of audiotape that changed the relation of voice and body: "Telephone and radio broke the link between presence and voice by making it possible to transport voice over distance"[194] - a perceptual shock disrupting occidental logocentrism.

cARCTIMEOSLOKEY2 / As long as archival records consist of coded symbols in alphabetic writing, a cognitive distance - in spite of the auratic qualities of handwritten manuscripts or autographs - can be more or less kept, since an act of decoding has to take place which involves the cognitive apparatus. But once photography and phonography, the first apparative media in its modern sense, became subject of the archive, the sense-affective, presence-generating power[195] of signal-based media cuts short the distance which is a prerequisite for *historical* analysis, in favor of mnemonic immediacy - the electric shock.

"Presence" generation nowadays oscillates between the analog and the digital, between "live" transmission and "real-time" processing.

"One can no longer distinguish, visually or aurally, between that which is reproduced and its reproduction <...> not even discern *that* or *when* reproduction or repetition, in the manifest sense of recording or replaying, is taking place. We must be informed whether or not what we are seeing is "live". <...> we cannot distinguish through our senses alone between what we take to be simply "alive" and what as reproduction, separted from its origin, is structurally posthumous [...]"[196]

- a chrono-traumatic irritation indeed, resulting in a cognitive-affective dissonance between what is conceived as "historical" and perceived as "present".

Phonotext. Berkeley (Univ. of California Press) 1990, as referred to in Hayles 1999, 207

192 See W. E. / Friedrich Kittler (eds.), Der Ursprung des Vokalalphabets aus dem Geist der Poesie, München (Fink) 2007

193 Valdemar Poulsen, Method of Recording and Reproducing Sounds of Signals, reprinted in: Marvin Camras, Magnetic Tape Recording, New York (Van Nostrand Reinhold Company) 1985, 11-17

194 Hayles 1999: 208

195 See Hans Ulrich Gumbrecht, Production of Presence. What Meaning Cannot Convey, Stanford University Press 2004

196 Samuel M. Weber, Mass Mediauras: Essays on Art, Technics and Media, Publications of the Power Institute, Sydney, Stanford UP 1996, 121

Sonic shock: Telephone call and answering machine

With Valemar Poulsen's presentation of the wire recorder at the Paris World Exhibition 1900, the telephone line which functioned as the (subjectively experienced) immediate transmission of telegraphic and tele-phonic communication turned out to be a storage medium for delayed re-play. From that resulted an irritation in the trust of presence in electric tele-communication.

Confronted with the telephone, Benjamin felt unsheltered in being exposed to the voice.[197]

The immediacy of the telephone voice can not be equalled by image-based telephony, as became apparent with the *Picturephone* propagated by Bell System in the 1960s and earlier experiments with cable-based *Bildtelephonie* in 1930s Germany[198] until the failure of Panasonic V*ideophone* (experimentally used for the Van Gogh-TV Kassel Documenta installation *virtural plaza*).

"Could there be a fundamental barrier to the acceptability of telephones with moving pictures?"[199]

Analog telephony *is* indecical, an acoustic touch, "audio-tactile" in McLuhan's sense, since such electro-acoustic transduction keeps the integrity of the physical signal even in "transformation" of mechaincal into electric waves - while the electronic image reproduces light waves which are immaterial electro-magnetic waves itself.

Even techonologically reproduces voices from microphone / speaker "are or appear - against the dominant positions in theories of voice, media and tehatre - by no means disembodied"[200]. Technically inbetween sound and sonicity, the "disembodied" radio voice is an interlacing of both physical voice transduction and immaterial electromagnetic ("wireless") transmission. Technical signal transmission here becomes a semiotic act: "A signal is an utterance of a discursive symbol or sign, deliberately placed by the utterer within what he believes to be the field of sensuous attention of another person [...]."[201] Still, the ear as such is "unsheltered against sonic violence.[202] Violent noise -

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197 Walter Benjamin, Berliner Kindheit um Neunzehnhundert, in: same author, Gesammelte Schriften, vol. IV, ed. Tillman Rexroth, Frankfurt/M. 1972, 235-304 (243)

198 See Isabell Otto, Happy Birthday from Skype. Zur Darstellung von Temporalität in einer Online-Werbekampagne, in: Zeitschrift für Medienwissenschaft vol. 9, no. 2 / 2013, 53-65 (59 f.)

199 A. V. Lewis / G. Cosier, Wither Video? Pictorial Culture and telepresence, in: Graham Walker / Phil Sheppard (ed.), Telepresence, Boston et al. (Springer Science * Business Media) 1999, 99-141 (101)

200 Doris Kolesch, Touched by Voice, lecture at the conference *Resonances* (MPI Bildungsforschung, Berlin, November 2013), *abstract*

201 C. J. Ducasse, Symbols, Signs and Signals, in: The Journal of Symbolic Logic, Bd. 4 (1939), 44

202 Jacques Lacan, Die vier Grundbegriffe der Psychoanalyse, Olten

sonicistic disturbance - is even the condition for the generation of oscillations which therefore can never be completely harmonic: An external disruption has to start the periodic event ("transients" as micro-traumatic eventality which is subliminally perceived by the ear nevertheless).

"The CD player was the first medium with which most people made first personal experience with the new concept of the 'digital' in everyday."[203]

"Warm" sound from analog sound recording media in contrast to the "cold" sound from digital carriers? The difference is between "signalling presence" (analog phonography, signal-based) *versus* "archiving presence" (sampled audio signals, requiring algorithmic processing before transduced back into the analog speaker).

In the opera composed and orchestrated by Philip Glass / Robert Wilson / Lucinda Childs *Einstein on the Beach*, a choir sings numbers and solfege syllables. Einstein's voice here is not simply phonographically disembodied, but digitally transformed into acoustic clusters.[204]

SONIC "RE-PRESENCING" AND TECHNOLOGICAL VOICING OF THE PAST

[From the phenomenological perspective, photography, phonography, cinematography, videography, the magnetic tape, and finally digital recording affect the human sense of time. Although apparently accommodated in every day consumption, this intrusion of the technically recorded past into the present has not yet been cognitively digested and continues to irritate the "cultural unconscious".[205] Media-induced irritations of the sense of the present happen in irruptive ways; such incisions of time are traumatic tempo*realities* - pluralizing the tightly coupled time triad of past-present-future into a plurality of micro-temporal figures of delay, anticipation and intra-temporal (time-critical) moments. These temporealities share central features with what in academic memory studies has become known as the unhistoricizable of traumatic remembrance. Next to "the distinctive role of media in mediating collective trauma"[206], there is a traumatic irritation both of presence and the

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1978, 178

203 Axel Volmar, lecture: "Enjoying CD Without Guilt: Negotiating 'Digital Sound' in High-End Audio Culture, 1982-1986", conference *Resonances. Music, Affect, and the City*, Max-Planck-Institut für Bildungsforschung (in cooperation with the Sawyer Seminar, Harvard University), 7 / 8 November, 2013

204 As discussed by Zeynep Bulut (King's College, London), lecture: Anonymous Voice, Sound, and Indifference, at conference *Resonances* (2013)

205 This term is an explicit analogy to Benjamin's neologism of an "optical unconscious" which was inspired by Sigmund Freud's psychoanalysis, describing temporal evidence which is not accessible to human senses immediately but with the camera only - in slow motion and fast forward display.

206 Amit Pinchevski and Tamar Liebes, Severed Voices: Radio and the

present induced by media technologies themselves.]

Sono-chronic tunneling of historical distance

The inverse meaning of the term "contemporary" is the *entanglement* of times which have been traditionally clearly separated on the time line.[207] The reverse of the delayed present is the specifically media-induced "re-presencing" of the past: technological ways of re-generating and re-storing present moments.

In Marcel Proust's *Recherche*, involuntary memory stems from material objects like the Madeleine cookie. In Walter Benjamin's paraphrase, the past here is "unmistakably present in some material object or in the sensation which such an object arouses in us"[208]. But there is another present in the past which does not adhere to the material artefact in *stasis* but emanates from a processual unfolding: like images re-played in electro-magnetic induction from magnetic video tape. There is a wave / matter - dualism in affective re-presencing, oscillating between "presence in default" and "in default of presence".

Electronic storage media for audio-visual re-play generate a presence of the past by actually addressing the perceptual nerves within the human in signals, not by symbols (such as historiographical texts) which require de-coding and address the cognitive mind (where historical modelling takes place). Tele-communication is mostly associated with the bridging of spatial distance by communication media (Shannon), but actually it extends to temporal distance as well when by signal-recording media the temporal gap is being un-done in favor of immediacy in the moment of re-play.

There are technical conditions "under which the absent past can be said to have 'presence' in the present" indeed.[209] The affective present-in-absence is central to technological media especially in the sonosphere. The absence here is the phenomenal dissimulation of the technological apparatus of signal (re-)production in favor of a "Sirenic" presence - Sirenic in the sense of human-like presence generated by machines.

Rigorous attention to material signals and machines escapes the risk of falling into a romantic orientation here.[210] The perceptual, phenomenomal impression of immediacy of the past when listening to the recorded human voice is a

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Mediation of Trauma in the Eichmann Trial , in: Public Culture 22:2 (2010), 265-291 (267)

207 See Daniel Rosenberg / Anthony Grafton, Cartographies of Time, New York (Princeton Architectual Press) 2010

208 Walter Benjamin, On Some Motifs in Baudelaire, in: same author, Illuminations, New York (Schocken) 1969, 158

209 Vivian Sobchack, Afterword. Media Archaeology and Re-presencing the Past, in: Erkki Huhtamo / Jussi Parikka (eds), Media Archaeology. Approaches, Applications, and Implications, Berkeley / Los Angeles / London (University of California Press) 2011, 323-333 (323)

210 Goddard 2014, p. 13

function of a concealed technology; the acousmatically hidden sound source has become techno-*logos* in the phonographic apparatus - which, in times before "hight fidelity" sound, has been still very present, both materially and in its self-co-expression as noise.

All temporality experienced by humans is in a constant present, as expressed in Henri Bergson's famous "memory cone"[211] where past perception is always compressed within perception of the present. "For beings living in the Now [...] not even past and future exist if not re- or pre-presented, respectively."[212] But while phenomenology makes use of such neuro-cognitive modelling (Husserl's "time diagrams" of perception of the present inbetween *retention* and *protention*), media archaeology tries to precisely identify the rather different operations of micro-technical signal transduction. All of the sudden, the top of the Bergsonean cone returns in the pick-up of a gramophone needle.

Sonic memory is arbitrary triggered by technological re-play such as a music record at the press of a button. Is what happens then "the re-living of an event that has already happened in linear time rather than an event as if it were happening now in repetitive or cyclical time"[213]? Does technology, even if invisible as it acousmatically is perceived, make a difference to the quality of "presence" perceived? The con-temporary condition is technological.

Different from reading textual records from the past which need to be cognitively decoded (alphabetic symbols and words), with every listening to an ancient recording a gap between time-affect and historical cognition opens. Ears can perceive nothing but acoustic presence, while the historical imagination induced by linear writing takes place in the mind exclusively. The media-archaeological sense of *arché* tries to dislocate this acoustic imaginary.

There is a specific difference between the photographic *punctum* as described by Roland Barthes for visual short-cuts of temporal distance and phonographic *re-presencing* of the transitory impressions of sound art. The articulations of sound art are time-objects in themselves.

The physical presence of any acoustic situation (which is the "real" of vocal frequencies) short-circuits the "historical" distance, when e. g. the myth of the ancient Siren singing is tested against the signals of a sound-generating medium (the technical *aerophone*) on the spot of the Homeric Siren scene, the Li Galli islands close to the Amalfi coast in Italy.[214] Emphatic historical past and techno-cultural present fold into one con-temporary condition.

Especially voice recording enables direct contact that is separated when history

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211 Special thanks to a critical reader of this text, Marcus Bastos

212 Georg Franck, Zeit und Geschichte / Time and History, in: Beiträge der österreichischen Wittgenstein Gesellschaft, vol. XIII, ed. Friedrich Stadler / Michael Stöltzner, Vienna 2005

213 Ben Anderson, Recorded music and practices of remembering, in: Social and Cultural Geography, vol. 5, No. 1, March 2004, 3-19 (17)

214 See W. E., Towards a Media-Archaeology of Sirenic Articulation. Listening with media-archaeological ears, in: The Nordic Journal of Aesthetics, No. 48 (2014), 7-17

time is stretched out on a continuous line[215] - a temporal "fold" (Leibniz) enabled by technology.

On the micro-physical level of technologies (transducing analog signals and processing digital data), there is a direct time-critical link between the (tempo-)real and the symbolic at the complete expense of the imaginary called "history".

The tempor(e)al interlacing between archiving the present and re-presencing the archival past becomes precarious when the focus is on traumatic memory. While a lot of such studies in concentrate on Holocaust and extreme war time experience in terms of historical eventality, the media-archaeological analysis more radically assumes that a traumatic irritation which is communicated by recordings of witnesses, like Claude Lanzman's notorious documentary *Shoah* where the viewer is affected or even "co-traumatized" (Jan-Claas van Treeck), already (*en arché*) stems from the technological setting itself which continuously challenges and irritates the human sense of presence as it was familiar in traditional textual, pre-signal recording culture.

Future in the past: Storage driven by a virtual trauma

Some phonographic recording and subsequent transcription of oral memory cultures has been undertaken for philological purposes like the recording of *guslari* epic songs in former Yugoslavia by Milman Parry and Albert Lord have been made primarily for the purpose of academic analysis, to answer by anachronistic analogy the "Homeric" question of how extended oral poetry works in a culture without writing. But in early twentieth century a couple of comparable projects in ethno-musicology such as performed by the Berlin Lautarchiv (resulting from prisoner recordings in World War One) are a technological function of traumatic anxiety about the disappearance of indigenous cultures, resulting in techno-archiving practices in the temporal mode of "future in the past". There is an anticipatory "Future in the past": archival storage driven by a virtual trauma of extinction. The monumental ethno-musical recording projects by the Phonogram Archive in Vienna and the Berlin Phonogram Archive (since 1900) were driven by the phantasm to counter-balance the anticipated future modernization or even extinction of existant sound cultures with technical audio-signal registration - a true techno-traumatic impulse.

Mary Ann Doane expresses the aim of this media-archivographical drive: "[...] to retrieve everything possible, driven by a temporal imperative (before it is 'too late') and the anticipation of a future interpretation [...]."[216]

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215 Geoffrey Winthrop-Young, Siren Recursions, forthcoming in: Kittler Now, ed. Stephen Sale / Laura Salisbury. Cambridge (Polity Press), note 5; http://phenomenologymindsmedia.files.wordpress.com/2011/05/winthrop-young-siren-recursions.pdf

216 Doane 2002: 222 (as quoted in Hadjioannou 2012: 174)

Just like Alan Lomax' notorious recording of American folk songs had been commissioned by the Music Division of the Library on Congress, the same institution commissioned Paul Bowles (an American resident in Algier) to record native Maroccean folk songs and rhythms on magnetic tape (financed by a Rockefeller Fondation Grant) in 1959. Bowles' initiative was driven by the fear that recently independent Marocco was about to destroy that native folk music culture in an effort of national modernization.

The pre-emptive media archive embodies a time-reversed trauma, known from grammar as "future in the past" *(futurum* exactum), arising from the technological condition of photography, cinematography and phonography itself: the concept that a cultural articulation might *possibly* be extinguished and thus in anticipatory ways needs technical pre-recording.

This temporal figuration in culture runs parallel to the even more time-critical operations in World War II electronics when analog, then digital computers performed predictive calculation of enemy moves in real time, applied to anti-aircraft defence, by literally *calculating* future in the past. Nowadays, such predictive analytics algorithms is exercised for profiling of potential terrorist attacks by the NSA in the survey of current telecommunication data. This is no archive from the past any more but actually an archive of the future, taking place in the contemporary.

The present can be delayed as after-effects as well as in anticipation. Just like the ethno-musical phonographic archives established in Vienna and in Berlin around 1900, and the photographic expeditions undertaken by Albert Kahn for his Parisean *Archives de la Planéte* in the 1930, Bowles' Marroccean folk song recordings was driven by a kind of anticipatory trauma that the indigene culture he referred to was about to be extinguished. Apparently he never listened himself to the tapes he feverishly recorded; almost forgotten they time-invariantly rested in magnetic (rather than cultural) latency until they were discovered for re-play.[217]

Such technical storage is not collective memory but a collection of recordings meant as memory of an anticipated *futurum exactum*, driven by a virtual trauma of extinction. The archival potential of phonographic recordings

"came at a time when many indigenous cultures were already severely threatened, or had already disappeared, ironically as a result of the same Western industrialization that produces the technology used for the documentation. [...] the fact remains that the technology provided a literal documentation that surpassed the results of even the most sensitive transcriber. <...> many ethnomusicologists were so conditioned by Western muscial practice that they intepreted what they heard and transcibred it according to Western musical notation, ignoring the microtonal variations that can still be heard on original recordings. Therefore, such objective documentation can be said <...> to preserve the aural artifacts of a culture"[218] - in facts its sonic temp*aura*lity. The technical recording (that is, the media-archaeological ear) preserves acoustic signals which might have already been

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217 See Hans Ulrich Gumbrecht, Latency (forthcoming)

218 Barry Truax, Acoustic Communication, Norwood, N. J. (Ablex) 1984, 118

obscured by symbolically coded cultural memory.

Disembodied voices from analog to digital analytics

At the end of World War II, the German Service of the BBC recorded voices of survivors immediately after the liberation of the concentration camp Bergen-Belsen to be broadcasted repeatedly *via* radio. Such recordings are preserved in the Phonothek of Deutsches Rundfunkarchiv in Wiesbaden. There is a momentum of temporal indexicality in such signal-witnessing, as expressed in the CD Booklet of the re-edition of these recordings.[219] The medium specificity embodies the character (or even timbre) of that epoque much more indexically than any printed text might ever achive - or *archive* in alphabetical transcription. Such *signal memory* allows for (and incites) new kinds of rather signal-b(i)ased linguistic analysis software like Praat. Such an analysis is less an emphatic recall of past sounds, but - in a kind of time-lense - a media-active archaeology of the *passing* in the vocal present itself which is not logo-centric any more but unfolds as something which is always already past when articulated.

Media technologies starting with photography have been associated with attempts to communicate with the dead - a "spectral logic" of re-presencing.[220]

Derrida defines his time sensation in voice recording: "I am always overwhelmed when I hear the voice of someone who is dead, as I am not when I see a photograph or an image of the dead person"[221] - in spite of the Barthean *punctum*. "I can be touched, *presently*, by the recorded speech of someone who is dead. I can, *here and now*, be affected <!> by a voice beyond the grave."[222]

But according to an hypothesis developed by John Durham Peters, this double *media* only takes place with analogue media and abruptly ends with digital data processing.

In discussing the essence of the *tone*, G. W. F. Hegel defines it in its temporal essence: "Ein Verschwinden des Daseins, indem es ist"[223]. - a disappearance of

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219 They have been published on Compact Disc by the Institut für Zeitgeschichte (Munich / Berlin) 2003 *Dokumentation Obersalzberg. Tondokumente. Täter Gegner Opfer*, ed. by Albert A. Feiber / Volker Dahm, track 20 and 21

220 See Amit Pinchevski and Tamar Liebes, Severed Voices: Radio and the Mediation of Trauma in the Eichmann Trial, in: Public Culture 22:2 (2010), 265-291 (283, quoting an expression by Jacques Derrida and Bernard Stiegler, Echographies of Television, Cambridge (Polity) 2002, 117)

221 Jacques Derrida, Above all, no journalism, in: H. de Vries / Samuel Weber (eds), Religion and Media, Stanford, CA (Stanford University Press) 2001, 56-94 (71). See Scannell 2014: 126

222 Derrida 2001: 71

223G. W. F. Hegel, Enzyklopädie (1830), § 459 (= Werke, Frankfurt/M. 1970, vol. 10, 271)

being, while it exits.

Whereas the archival record - as linear textuality - is conceptually linked to the historical past, signal recording triggers the temporality of latency - which is *implicit* presence of the past.

The audio engineering software Audacity allows e. g. for automatically tagging both intentional and non-intentional (even traumatic) "silence" in audio files - inaudible sound where time itself speaks, as provided by the "Analysis"-toolbar of the audio software Audacity under the explicit term of "Silence Finder". The "Effects" tool, on the other hand, allows for "removing silence" or to create "echo" from audio signals, which is manipulation of the sonic time event on its minutest level. The "echo" itself embodies the time figure of delayed presence or even "archiving presence": Only recorded presence can be echoed. In reverse, the echo is a temporal mirror of presence itself, thereby undercutting any clear observational distinction between presence and past.

The technological momentum of "Messianic" time: : Digitized video testimony

Geoffrey Hartman's creation of a video archive of testimony by Holocaust survivors at Yale University in 1981 was driven by the impulse to keep that memory con-temporary. There is a medium-specific temporality of both video art[224] and video testimony which affects the human spectator: "A medium of redemption at once private and collective, videotestimony is Jetztzeit caught on tape, complete with all its 'chips of Messianic time.'"[225]

According to Marshall McLuhan's *Understanding Media* (1964), it is the (mass) media content which makes the spectator (or audience) "blind" for its essential technological message. It is the *mediaura* (Samuel Weber) of the video technology itself which evokes the presence effect.

Already the phonographic record allowed for time axis manipulation against the apparent irreversibility of history. New media are "vehicles that carry our senses and bodies across the space-time continuum [...]."[226]

On the techno-material, media-archaeological level, the entropy of *analog* video testimonies kept within the Fortunoff Video Archive for Holocaust

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224 On the quasi-biological impact of the analog video image, see Ina Blom, The Autobiography of Video. The Life and Times of a Memory Technology, Berlin (Sternberg Pr.) 2016

225 Pinchevski 2012: 153, quoting Walter Benjamin, Theses on the Philosophy of History, in: same author, Illuminations: Essays and Reflections, trans. Harry Zohn, ed. Hannah Arendt (New York, 1969), 263 [New York: Schocken 1987]

226 John Durham Peters, Helmholtz, Edison, and Sound History, in: Lauren Rabinovitz / Abraham Geil (eds.), Memory Bytes. History, Technology, and Digital Culture, Durham / London (Duke University Press) 2004, 177-198 (195)

Testimonies in Yale (three-quarter-inch U-Matic videocassettes) still shares the sense of history: slow degradation, wasting away. This is familiar to the human experience of time as passing, the one-directional time arrow. But digital sampling freezes such a video recording in its actual state, suspending it from "history" as further transformation. There is a remarkable difference between analog video deterioration and digital pixel artifacts (or glitches in the sonic sphere) - a different kind of testimony, to time itself.

A temperature-controlled room in the Yale archives can only slow down, but not arrest the entropy of the magnetic tape. The video testimonies available for viewing at Yale have therefore been VHS copies of the originals. This vulnerability of material signal carriers to physical entropy is counter-acted neg-entropically by digitization (in terms of Shannon entropy) - "[...] a development that reasserts the tension between storage and dissemination at the base of this archive."[227] This leads to a different kind of memory-in-the-present which becomes a function of numerical values - re/counting instead of telling. Once the records have been digitized and can be coupled to *online* media, the former tension between long-time storage and immediate dissemination collapses.

Henri Bergson describes the interlacing of present perception and past recollections as electric circuit.[228] When humans are in the Internet browsing state, memory there is not past, but a spatio-temporal latency.

Digital signal processing allows for new forms of time-axis manipulation, simulation and referential illusions. Already preceded by digital character animation in Hollywood film industry, up to algorithmic re-viving dead actors like Bruce Lee, the 3-D-scanning of Holocaust survivors for interactive re-enactment actually de-hisoricizes the presence of the past.

Once traumatic memory such as Holocaust survivor video testimony can be accessed on YouTube, such a kind of digital library invites users for re-mixing it in parts. Sampling in the engineering sense (digitization) suddenly corresponds with sampling in the cultural, post-modern sense, "falsifying time" (Paul Frosh) by re-integrating traumatic time (absence) into the symbolic order again.[229]

Real-time signal processing technologies in *online* and *streaming* media[230], with its chrono-aesthetics of mathematical Markov processes where the probability of reporting a single data event is modulated by the presence of an immediately earlier one, results in a "priming" process that temporarily

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227 See Amit Pinchevski, The Audiovisual Unconscious. Media and Trauma in the Video Archive for Holocaust Testimonies, in: Critical Inquiry, vol. 39, no. 1 (Autumn 2012), 142-166 (145, note 7)

228 See Gilles Deleuze, Bergson zur Einführung, ed. and transl. Martin Weinmann, Hamburg (Junius) 1989, 87, referring to Bergson's *Matière et Mémoire*

229 An argument derived from the lecture "The Hot and Cold Channels of Co-Trauma" by Jan Claas van Treeck at the Workshop xxx, HU / HU, Jerausalem, xxx 2015

230 See Douglas Rushkoff, Present Shock. When Everything Happens Now, New York (Penguin) 2013

enhances the effective gain of the perceptual "present window" on the timescale of seconds. In probability theory and statistics, a stochastic Markov process "can be thought of as 'memoryless': loosely speaking, a process satisfies the Markov property if one can make predictions for the future of the process based solely on its present state just as well as one could knowing the process's full history. i.e., conditional on the present state of the system, its future and past are independent."[231]

The almost immedate, non-linear accessability of Internet websites is more akin to what physicists call a 'wormhole' - a shortcut connecting distant points in space and time"[232], a tunneling of temporal distance, a making of the past con-temporary.

231 Retrieved from "https://en.wikipedia.org/w/index.php?title=Markov_process&oldid=712058457", referring to the entry "Markov process (mathematics)" in the Britannica Online Encyclopedia. Accessed 25 July, 2016

232 Frosh / Pinchevski 2009: 303