TECHNOLOGICAL VOICING OF TRAUMATIC MEMORY AND SONIC MEDIA TESTIMONY

[Related to lectures presented at workshop *Techno-Trauma. From Analog to Digital*, Humboldt University Berlin, April 2014, and to subsequent workhop at Hebrew University, Jerusalem, May 2015]

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Introduction

Audiovisual signal recording has resulted in new kinds of awareness and practices of temporalities. From the phenomenological perspective, signal replay in photography, phonography, cinematography, videography, the magnetic tape, and finally digital recording affects the human and even animal sense of time. Spefifically the phonographic irritation has been iconized by the HMV record label *logo* (derived from Barraud's original painting) where the dog Nipper literally listens to "His Master's Voice".

In telephone directories of post-war West Germany, a special icon after the numerical address signified the possible interaction of an answering machine as a warning against the subsequent irritation of the present call.

This situation has been described by Walter Benjamin (referring to cinema) more acutely as a "chock" for sensation. Although for generations media records as text, sound or images have become accommodated in every day consumption, this intrusion into the sense of presence has not yet been cognitively digested and continues to irritate what might be called the "unconscious" of cultural time - in an explicit analogy to Walter Benjamin's neologism of an "optical unconscious" (inspired by Sigmund Freud's psychoanalysis), describing evidence which is not accessible to human senses but to the camera only - as revealed in slow motion and fast forward display.

Such media-induced temporal interruptions and incisions are traumatic tempo*realities* - pluralising the tightly coupled time triad of past-present-future into a whole cosm of micro-temporal figures of delay, anticipation and intra-temporal (time-critical) moments. These temporealities share central features with what in recent academic memory studies has become known as the unhistoricizable of traumatic remembrance. Next to "the distinctive role of

media in mediating collective trauma"[1], there is trauma induced by media technologies themselves.

Let us therefore turn from the phenomenological to the media-archaeological perspective and concentrate on the time-critical element within and induced by technical media.

An escalation of this situation is so-called *media witnessing* where crisis is not experienced as an exceptional eventality any more like historical revolutions or natural desasters in the past but "as a generalized and routine background condition - a persistent crisis-readiness" (Frosh / Pinchevski). In a more techno-radical reading, this background is no diffuse condition of contemporary society as described by sociology but is rooted in the time-critical conditions of such media technologies.

Media memory of traumatic experience, in academic research, is primarily being discussed in the contect of visual devices such as the Holocaust witnesses video recordings; the following analysis rather concentrates on the audio-specific qualities of traumatic memories and its chrono-psychic implications. Whereas *aura* as defined by Walter Benjamin
depends on the impression of being uniquely "here and now", technological temp*oral*ity and specifically its sonic articulations culminate in the archetype of a deferred and delayed presence, the electrified voice and its media-temp*aural*ity. Instead of "oral history", we might rather say: aural presence of the past.

Media-specific traumatic aurality will be discussed in case studies of "broken presence": the Christmas 1942 *Ringsendung* broadcast from war fronts by German national radio; phonographic pre-storage driven by a pre-emtive "future in the past"; magnetic voice recordings immediately from (and beyond) concentration camps; and finally disembodied voices "from analog to digital".

Broken presence: "Ringsendung" x-mas 1942

Phonographed voices do not simply articulate the original body but embody the co-articulation of the transmission technology itself. In the recording of the radio Christmas-greetings from several points of the war front, broadcasted by the German Großdeutscher Rundfunk on December 24, 1942[2], the human voice is traumatically distorted by electro-magnetic transmission itself.

The booklet of the Compact Disc edition of this recording reminds that such recordings are essential for the testimony of 20th century history. "Without them mentalities and tunings [*Stimmungen*] of that epoque can hardly be

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[1] 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 (267)

[2] See Dominik Schrage, "Singt alle mit uns gemeinsam in dieser Minute". Sound als Politik in der Weihnachtsringsendung 1942, in: Daniel Gethmann / Markus Stauff (eds.), Politiken der Medien, Berlin (diaphanes) 2005, 267–285

communicated."[3] But such tunings are not only cultural but directly results from the technical mode of AM transmission itself to which the present listener gets "attuned" (expressed in Martin Heidegger's sense).

Signal recording is not a witnessing of "Geschichte" which only takes place in historiographic narrative. Instead, it is an auto-referentialty of the transmission technology itself. The original (or even studio-manipulated) signal distortions are an index of authenticity of live radio transmission across long distances over the Short Wave military channels, a short-cut between soldiers at the war front and their families at home which can only take place in the technological radio-sphere. While this was meant to have a calming effect of synchronicity between relatives in Christmas time, sensation at home was at the same time irritated by the technical reminder of the spatial gap, the "shock of absence" audibly incorporated within the apparent temporal immediacy (Jan-Claas van Treeck). The liveness of the joint singing of "Stille Nacht, heilige Nacht" is spectral - both in its phenomenological sense (ghosts, the undead), but as well literally: the electromagnetic spectrum of the radio signal. The Freudean unconscious "It" expresses itself on the media-archaeological level, as a traumatic *momentum*.

The acoustic reverberations which take place, just like the spectral distortions and filters, provde the "live" transmission with a micro-temporal irritation. The present here is already distanced to itself, while at the same time letting a most intimate signifier of the German soul (the song *Stille Nacht*) shine through.

Amit Pinchevski and Tamar Liebes define radio wave transmission as "signals from afar that make intimate contact". While this applies to electronic communication media in general, "radio constitutes a distinctive configuration of presence-at-a-distance through the separation of body and voice and the reconstruction of a disembodied voice. [...] the body cannot endure transmission, whereas the voice can."[4]

This split between an original sound source and its electroacoustical recording results in what R. Murray Schafer called "schizophonia"[5] - a dissonance between the affective and the cognitive awareness of sonic time signals.

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[3] "Ohne sie können Mentalitäten und Stimmungen dieser Epoche nur schwer vermittelt werden". Booklet to the Compact Disc published by Institut für Zeitgeschichte (Munich / Berlin) 2003, *Dokumentation Obersalzberg. Tondokumente. Täter Gegner Opfer*, ed. by Albert A. Feiber / Volker Dahm

[4] 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 (271)

[5] "Schizophonia is a term coined by R. Murray Schafer to describe the splitting of an original sound and its electroacoustic reproduction." en.wikipedia.org/wiki/Schizophonia#cite_note-1, accessed December 23, 2013, referring to: R. Murray Schafer, The New Soundscape: A handbook for the modern music teacher, BMI Canada, 1969

In electro-magnetic "acoustic space" (McLuhan[6]), a different tempor(e)ality reigns which allows for a rather "symphonic" resonance between past and the present which - what ever the semantic content - is the media-archaeological message of the technological condition for such radio transmission and reception itself: the "resonant circuit" in electronics (German *Schwingkreis*).

Even generations later the impact of such acoustic transmission of an event can still be "re-presenced" (Vivian Sobchack) in auditory perception which is the human surrogate time sense. The impact of the acoustic "real" does not only "affirm the effect of the original event"[7], but irritates and micro-traumatically undermines the symbolic time order of historical distance.

Future in the past: Storage driven by a virtual trauma

Phonographic recording and subsequent transcription of oral poetry has been undertaken for philological purposes like *guslari* epic songs in former Yugoslavia by Milman Parry and Albert Lord 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".

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.

In fact, the "cultural" reverse of the trauma linked with real genocides (notably the Armenian case or the Holocaust) is the persistent fearful anticipation of the future extinction of ethnic articulations of which the emerging audio-visual recording media like phonotgraphy, phonography, and cinematography are *both a symptom and an answer* since early 20th century.

Inbetween is the use of material (museum), signal-based (audio-visual recording) and symbolic (alphabetical) records to replace a living cultural memory by manipulatable storage, is was the case for the present with the *Theresienstadt* ghetto film from 1944/45 and the Central Jewish Museum project in Prague under German occupation 1940-43 to create a *futurum exactum*[8]

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[6] See Carpenter, Edmund, and Marshall McLuhan, Acoustic space. In: Explorations in communication, edited by Edmund Carpenter and Marshall McLuhan. Boston (Beacon) 1960
[7] Pinchevski / Liebes 2010: 274

[- just like Albrecht Meydenbauers German Monument Archive (Deutsches Denkmälerarchiv), based around 1900 on photogrammetric measuring of historic architectural heritage, anticipated future destruction of the originals caused by possible wars already.]

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

This temporal figuration which became even much more time-critical in the subsequent World War II when electronic 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 - like nowadays the predictive analytics algorithms exercised by the NSA in the survey of current telecommunication data. This is no archive from the past but actually an archive of the future.

Just like the phonographic archives established in Vienna and in Berlin around 1900, the photographic expeditions undertaken by Albert Kahn for his *Archives de la Planéte* in the 1930 and further projects, 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. Appararently 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.[9]

This is not collective memory but a collection of recordings in technical storage - meant as memory of an anticipated *futurum exactum*, driven by a virtual trauma.[10]

"The archival potential of such <sc. 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. <...>

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[8] See W. E., Symbolischer Tausch und der Tod (die Unmöglichkeit des Museum): das nationalsozialistische Projekt eines jüdischen Zentralmuseums in Prag, in: Geschichtswerkstatt 24 (July 1991), 45-56

[9] See Hans Ulrich Gumbrecht, Latency (forthcoming)

[10] The reverse is the current "Retromania" (Simon Reynolds) im popular music which compensates for the absence of utopean or avantgardist perspectives in current musical culture - a thought expressed by Jan Rohlf for the 2014 theme of CTM - Festival for Adventurous Music and Art "DIS CONTINUITY", Berlin (January / February, 2014)

["[M]any 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"[11] - in facts its sonic *aura*. The technical recording (that is, the media-archaeological ear) preserves acoustic signals which might have already been obscured by symbolically coded cultural memory. Even if "[t]here is no guarantee that one can ever bridge the gaps between cultures" - and temporal distance between sonic articulations -, "the perspective of time and familiarity can certainly clear a way some of the veils that obscure a culture from us"[12] - revealing the sonicity of the cultural unconscious.]

Voice recordings from (beyond) the concentration camps

Storage media create a technical memory which differs from the dynamics of collective memory which linguistically emanates from social communication. But once biased by electric current again, the volatile magnetic remanence and the induced electric flux are as close as possible to what Maurice Halbwachs described as the mobile character of social memory. Especially when it comes to witnessing traumatic experience, a double structure arises:

On the level of direct evidence, media *record*, thus: technically *witness* traumatic experience; on the other hand there is a deeper, hidden traumatic irritation of a continuously present, that is: non-historicisable past which is a function of signal recording media themselves[13]

- as has been in a less deadly context been demonstrated in Dan Graham's classic video installation *Present- Continuous - Past* (1974).

Let us pay attention to the recording of voices of displaced surviving prisoners from former Concentration Camps immediately after WWII on wire recorder - a machine used by Albert Lord as well when re-recording oral poetry from (partly) the same *guslari* singers decades after their first recording by Milman Parry's on aluminium discs.[14] Psychologist David P. Boder from Illinois Institute of Technology travelled to Europe in 1946 equipped with such a wire recorder. While Boder himself published the interviews in his *I Did Not Interview the Dead* (1949), the destiny of the wire spools themselves has been traced in Rosen's monography *The Wonder of Their Voices*.[15] The real wonder, though, is the bodiless, time-shifted repeatability of voices through techno-logy (signal recording of the *logos*), since this time-shift is governed by technological rather than "collective memory" (dis-)continuities. A set of copies of Boder's spools

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[11]   Barry Truax, Acoustic Communication, Norwood, N. J. (Ablex) 1984, 118
[12]   Truax ibid.
[13]   This is one of the guiding theses in the research project *Archiving Presence* between Media Studies at Humboldt University, Berlin (W. E.) and Communication Studies at Hebrew University in Jerusalem (Amit Pinchevski) 2013-2015
[14]   See Drubek 2013: 250
[15]   Pinchevski 2012: 145, note 6

arrived at the Library of Congress in Washington in the 1960s, about 20 years later - a period of latency both in the electro-magnetic essence and in the sense of historical time. The responsible sound engineer John Howell had to struggle with playback machines apt for spools of different sizes. He had to "recondition" it technically.[16] Where such a replay apparatus is missing, the signal carriers remain in latency. They are there, but do not "speak".[17]

The logic of memory maintenance and transmission of such records at first glance looks contingent but in fact "beneath the surface" - which is the media-archaeological level - "there was some rhyme and reason"[18] - the laws of techno-logic timing. The "technical" difference between signal memory (audio recordings) and symbolic memory (textual transcription), in Boder's case especially, is crucial for the re-discovery and the techincal recovery of Boder's interviews. "Boder's written work lived a life separate from the recordings that gave birth to them." Chronicling the destiny of the Boder materials "dramatizes how archival divisions splintered unified work into discrete components. Scholarship has likewise followed the shifting winds of technology; what is" - literally electro-magnetic - "current is what defines the field."[19] In Kittler's sense this means: Media determine the situation of collective memory.[20]

The case of the Boder interview argues the need to retain a *technical* knowledge of origins in the media-archaeological sense as a means to define what is significant, that is: what can be recognized as *signals* literally. "Otherwise, the wonder of their voice may never be heard."[21] But against being affectively being absorbed by the wonderous acoustic testimony, the media-archaeologial ear keeps distance. Distancing through technology is indicated in John Hersey's epic novel *The Wall*: "[...] if for Boder the wire recorder aided in a quest for versimilitude, in the case of Hersey is helped to liberate him from it."[22] There is an inherent paradox and a traumatic irritation for humanities in the fact that the most immediate reminder of a crime against humanity is itself of a complectely non-human nature: wire recording. In her book *How We Became Posthuman*, Katherine Hayles writes about Boder's association with the Illinois Institute of Technology where Camras propagated and improved the wire recording technology.[23] Camras obviously played a role in moving Boder to undertake what others did in more conventional ways of alphabetic recording.

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[16] See Alan Rosen, The Wonder of Their Voices. The 1946 Holocaust Interviews of David Boder, Oxford 2010, 168, and 280, note 55

[17] See the different wire recorder spool sizes as demonstrated in: Video Interchange (May 26, 2008) = http://www.videointerchange.com/wire_recorder1.htm

[18] Rosen 2010: 167

[19] Rosen 2010: 174

[20] See the "Preface" to Friedrich Kittler, Grammophone - Film - Typewriter [German Original 1986], Stanford 1999

[21] Rosen 2010: 174

[22] See the sub-chapter "Filtered from Documents: The Wire Recorder and John Hersey's *The Wall*", in: Rosen 2010: 171-174 (171)

[23] Katherine Hayles, How We Became Posthuman. Virtual Bodies in Cybernetics, Literature, and Informatics, Chicago: University of Chicago Press, 1999. See David Morton, Armour Reseach Foundation and the Wire Recorder: How Academic Entrepreneurs Fail, in: Technology and Culture, vol. 39 (1998), 213-244

The 90 hours of Boder's vocal recordings can now be heard on the "Voices of the Holocaust" website.[24] Such recordings are not simply voices from the past but voices from survivors among the community of the otherwise dead: reverse "collective memory", traumatic suspense resisting historic memorization.

A further wire tape from Boder's recordings has recently been discovered at the Cummings Center for the History of Psychology, University of Akron, Ohio, as a side-effect of Jon Endres' digitization project: "The discovery of this single canister holding a lost recording means that these songs can be heard again, they can be studied, and they can inform us in a new way about the experiences, the joys, and the frustrations of these displaced persons", and: "It felt like I was helping in some way to bring these voices to the present, voices that had become somewhat lost to the historical record."[25] But actually the songs could not be heard again without an intermediary interpreter, the wire recorder itself, to disclose the signals in non-historical latency to human understanding. The Cummings Center Blog is subtitled "exploring what it means to be human", and one response in the Blog answers *Such strong voices. Consider that these singers had just watched their loved ones destroyed.*[26] But it takes operative electronics as active media archaeologist of transmission of cultural tradition. "It took me a few days to get comfortable enough with the medium to put the Henonville Songs on to digitize – these are very fragile and I did not want to risk destroying history – but when I did I was blown away" (Endres) - techno-traumatically.

Several samples from the Henonville Songs spool are provided on the Cummings Center Blog: "Please give them a listen, they've been waiting a long time" (Endres). This hermeneutically presupposes a memory imperative to posterity which is not inherent in the technical signals themselves. Most personal responses to the blog post announcement of the finding get lost in sentimental hallucinations of the voice of the dead, ignoring the fact that digitization website has already transsubstantiated the techno-real of analog recordings into binary information which invites for a different form of intelligence. Algorithmic experimentation with such digitized audio evidence rather leads to non-hermeneutic discovery of hidden knowledge, like a spectral analysis of the timbres of the testimony voices, articulating a different, even counter-message than the verbal (or score) transcription of evidence.[27]

Disembodied voices from analog to digital analytics

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.

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[24] http://voices.iit.edu; see FN 4 in Drubek 2013: 250

[25] https://centerhistorypsychology.wordpress.com/2016/09/02/dr-boder-and-the-missing-songs (accessed 8th February, 2017)

[26] Claudia Miriam Reed, February 7, 2017

[27] On such "active archive" experimentation with algorithms, see the research art group Constant (Brussels).

There is a specific sonic momentum of temporal indexicality, as expressed in the CD Booklet: The recordings are in manifold ways more authentic ("authentischer") than more recent statements of witnesses which have been transformed by new experiences and mental processing - signal-witnessing. The recordings of the Jewish cellist Anita Lasker and Lotte Grunow are preserved in the Phonothek of Deutsches Rundfunkarchiv in Wiesbaden.[28] The booklet of its edition on Compact Disc tries to catch the medium specificity of such *signal memory*; referring to tape system-internal recordings "which illustrate the 'spirit' and character of the regime much more impressively than any printed text might ever achive"[29] - or archive.]

On track 21 concentration camp survivor Lotte Grunow expresses her dispair with trying to organize her fresh memories into narratable form: "Da weiß man nicht, wo man anfangen soll" ("One does not know where to begin"). This rupture is the traumatic moment. At several instants of the recording, her voice seems to hesitate or to double for a micro-phonetic moment. Is this an index of *read* text, of traumatic speech iteration, or a technical effect of digital buffering of the audio file itself? In the latter case, the apparent traumatic shock turns out to be a function of technology itself.

A techno-sonic analysis of such recorded voices allows for the memorization of such traumatically experienced presence in revealing subtle nuances of voicing (somewhat deconstructing the message of the official "acousmatic" commentator voice from the *off*[30]).

Instead of traditional alphabetical transcription, linguistic analysis software like Praat allows for (and incites) new kinds of rather signal- than archive-b(i)ased mobilization of recorded memory: phonetic speech analysis, active archaeology of past sounds. In such algorithmic analysis, audio recordings from the the past are not just archival objects any more, but become items in an experimental laboratory of "archived presence". Semantic emphasis can be identified as a function of tonal pitch in the recorded voice, just as Max Planck - in a recording from 1939 in the Lautarchiv collection "Stimmen berühmter Persönlichkeiten"[31]

raises (in German: "erhebt") his voice with the very German word "erhebt" itself, and lowers it with rhetorical skill at the end of his phrase in the last word "Gelehrten" (scholars). The techno-mathematical analysis of intonation, performed by Nikita Braguinski with the software Sonic Visualizer, reveals Planck's application of quasi-musical phrasing and thereby bridges the gap between semantics and affect.

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[28] 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
[29] "<...> die <...> 'Geist' und Charakter des Regimes sehr viel eindringlicher veranschaulichen, als dies ein gedruckter Text je könnte"
[30] See Michel Chion, Audio-vision. Sound on screen, New York (Columbia University Press) 1990
[31] See Web site of the Lautarchiv = B8-29 Max Planck

Let us apply such sonic analytics to sonic records from traumatic past as well. Recent experiments with the "archival" *a priori* of digital audio memory organization have resulted in more dynamical tools of inquiry: search algorithms which are closer to the mechanism of human remembrance which is always in motion itself.

This allows e. g. for automatically tagging both intentional and non-intentional (even traumatic) "silence" in audio files - inaudible sound where nothing but time (and the recording medium) speaks, as provided by the "Analysis"-toolbar of the audio software Audacity under the explicit term of "Silence Finder".

This tool might be applied to the magnetic tapes from the historic Frankfurt Auschwitz trial.

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 the clear observational distinction between presence and past which is emphasized by systems theory (Spencer-Brown / Luhmann).

The notion of "crisis" is linked to the very time-criticality of real-time signal processing technologies of today like *online* and *streaming* media. Whereas analog live electronics in its potential transmissibility of almost all events still adhered to the linear temporal unfolding of events as represented in historiography, the almost immediate, non-linear accessability of Internet websites is more akin to what physicists call a 'wormhole' - a shortcut connecting distant points in space and time"[32]. This tunneling of temporal distance (to refer to the quantum-mechanical terminology) undermines the dominance of historical discourse in negotiting emphatic time experience.

Media technologies starting with photography have been associated with attempts to communicate with the dead. "By extending indefinitely the gap between the body and its traces, by exceeding the ontological opposition between presence and absence, media technologies conjure up a 'spectral logic'."[33]

Derrida defines his sensation of the *anima* 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"[34]

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[32]   Frosh / Pinchevski 2009: 303

[33]   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

[34]   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 Paddy Scannell, Television and the Meaning of Life, Cambridge (Polity) 2014, 126

- in spite of the Barthean *punctum*. Visual presence is based on electro-magnetic wave signal transmission ("radio"-like): almost immediate, whereas acoustic sensation is based on slow run-tíme in mechanical matter:

"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."[35]

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.

Signal recording performs the *in*distinction between message and noise, referential recording and the articulation of the recording device itself - while binary data - though technically still being embodied in electrophysics and driven by current energy - *per definitionem* in communication theory abstract from the material implementation.

Different from reading historiographical writing, the audio channell has an almost ahistorical power of presence, even if cognitively the recording from the past is immediately contextualized as historical. The recording of the acoustically or optically "real" physical signal is opposed to symbolic notation by the alphabet not only in a technical but also in an epistemological way: the difference between physical signal as indexical and the arbitrary cultural symbol. With computing, though, this dialectic opposition becomes synthesized, since Digital Signal Processing (notably sampling of audio events) is a function of discrete symbolization, a re-entry of the "alphabet" in numerical and logical form.

If according to Walter Ong the electronic revolution in mass media communication devices like radio and television has led to a "secondary orality", communication based on the symbolic machine (computing) has led to a (hidden) secondary alphabetic revolution, with bits and bytes inheriting the typeset, but different from the printing culture in a dynamic way.

The voice turns silent and still articulates - in implicity mathematical sonicity which is the ultimate shock to occidental logocentrism.

Sonic media testimony and the audio-visual gap: *Theresienstadt*

The time figure of "archiving the present" *in realtime* and the techno-archival drive to encapsulate audio-visual evidence by preemptive technical recording consciously or unconsciously counter-balances feared or planned cultural and even human extinction - just like in World Ware II anti-aircraft artillery calculated the immediate future of the enemy aircraft behaviour in order to anticipate its lethal action - counter-calculating the present. The use of material (museum), signal-based (audio-visual recording) and symbolic (alphabetical) records hereby replaces a living cultural memory by manipulatable storage, is was the case for the present with the *Theresienstadt* ghetto film from 1944/45 and the Central Jewish Museum project in Prague under German occupation

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[35]   Derrida 2001: 71

1940-43 to create a *futurum exactum*[36] - both commissioned by the German SS.

In the case of the voices of German Jews recorded for that film under the contemporary title *Theresienstadt. Ein Dokumentarfilm aus dem jüdischen Siedlungsgebiet* (1944/45)[37], the voice recordings are an indexical trace of a traumatic experience preserved even against the covering ideological German commentator voice.

After the voices of the Jewish prisoners had been used for this sound film, "most of them were eventually killed, as they were witnesses of the filming"; they were either murdered or left Theresienstadt for Auschwitz almost immediately after the shooting of the film in the so-called *Herbsttransporte* of 1944. "This makes the voices in this film a rare document from the camps still waiting to he heard: the recordings from the Thresienstadt film are yet undeciphered audio 'kassibers'"[38], writes Natascha Drubek. And Drubek further: "The film presents a challenge, confronting us as an audiovisual document of a 'presence' which begs for deciphering, as it is referring to the invisible and inaudible 'absence'. Analyzing the film we become aware that even the exploited voices carry 'kassibers'."[39] Yet the term *kassiber* ("from the Yiddish word *kesive* which means writ, letter"[40]) which refers to the symbolic (i. e. historiographical) regime misses the memory specificity of electronic signal recording.

"Every recording device is partial and defective", writes Geoffrey Hartman, director of the Yale Fortunoff Video Archive for Holocaust Testimonies, on the conflict between preserving what he calls the "personal story" and the role of audiovisual documentation: "Questionaires are coldly informative and rarely convey the feeling of the life actually lived. Audiotape does better, but the voice it transmits is strangely disembodied, and audio tape collections tend to become inert unless transcribed."[41] But this inertia is exactly what classical psycho-analysis (Freud) calls "latency".

Black Boxes of sonic memory

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[36] See W. E., Symbolischer Tausch und der Tod (die Unmöglichkeit des Museum): das nationalsozialistische Projekt eines jüdischen Zentralmuseums in Prag, in: Geschichtswerkstatt 24 (July 1991), 45-56

[37] See Natascha Drubek, The Exploited Recordings. Czech and German Voices in the Film "Theresienstadt. Ein Dokumentarfilm aus dem jüdischen Siedlungsgebiet" (1944/45), in: Zakharine / Meise (eds) 2013, 249-273

[38] Natascha Drubek 2013: 254

[39] Drubek 2013: 269

[40] Drubek 2013: 252

[41] Geoffrey Hartman, Preserving the Personal Story. The Role of Video Documentation, in: The Holocaust Forty Years After, ed. Marcia Littell / Richard Libowitz / E. B. Rosen, Lewiston, ME: Edwin Mellen, 1989, 54 = quote Rosen 2010: 151

In May 2011 two aeroplane Black Boxes could finally be saved from the submarine ground of the Atlantic - the data recorder *plus* the voice recorder keeping not only the last words of the pilots in the cockpit but as well the background noises which might retrospectively signal the unfolding desaster. The wave forms and sonagrams both voice signal and all kind of noise, mixed, often undistinguishable. Both devices proved to be miraculously intact two years after the 2009 crash of the Airbus of Air France. Both data recorders consist of memory chips which keep their magnetic charge, different from the mechanically vulnerable turning cylinders, discs or tape or wire spools of previous recording media. Whereas mechanical records still provide the culturally familiar form of physical impression (writing), electro-magnetic latency is a different, sublime, uncanny form of insivible, non-haptic memory. Listening to the recovered voice recorder from the cockpit after a plane crash is traumatic immediacy, rather re-enactment than protocol. The voices and sounds emanating from such a black box are radically bodiless, being in a different temporality than the familiar historiographical time.

Radiophonic testimony

The technical wonders of "archiving presence" is bound to a audiovisual specificity: "Video is important because the voice as such, without a visible source, remains ghostly. That is, when you take away the visual, when you just hear the voice, the effect is that of disembodied sound, as if from the dead, from an absence."[42] The traumatic irritation of presence therefore is of media-specific quality (continuous audio signal recording vs. discrete image recording by frames).

As has been argued by Pinchevski and Liebes, the live radio transmissions of the Eichmann trial in 1961 "became inseparable from the memory of the trial itself <...>."[43] What is the distinctive, specific role of *technical* media in "mediating" collective trauma? "It is as if the logic of radio dictated a necessary trade-off: for trauma to gain voice, the body — the locus of trauma — had to be discarded. By removing survivors' voices from their bodies, radio effectively redefined the conditions by which trauma could find public articulation. The radiophonic separation between body and voice <...> afforded survivors passage from silence to speech <...>."[44] In terms of the electro-magnetic event, the co-witnessing affect of radio voice transmission is preserved in its recording on magnetic tape. The authenticity of the media event is preserved. From that technological condition arises a unique option for time-reversed re-presencing traumatic testimony. While the affect of traumatic testimony disappears when recorded in alphabetic historiography, it is preserved in signal transmission.

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[42] Geoffrey Hartman, "The Ethics of Witness", in: Lost in the Archives, ed. Rebecca Comay (Cambridge, MA: Alphabet City, 2002), 494, quoted in Rosen 2010: 277, note 14
[43] 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 (267)
[44] Pinchevski / Liebes 2010: 278

Case study: Media-archaeological voice analysis (Hitler, Himmler)

A kind of acoustic memory shock has been the unexpected turning-up of a *mémoire involontaire*, a magnetic recording of Hitler's voice on a AEG tape, recorded by microphones once installed in the train waggon which carried Hitler and the Finnish General Field Marshall Carl Gustaf Emil Mannerheim on occasion of Hitler's visit in 1942, on occasion of Mannerheim's 75th birthday, at a train station near the airport of Immola in Finland. Eleven minutes were secretly recorded by Thor Damen, a sound engineer of the Finnish Broadcasting Company (Yleisradio) on June 4.

While Hitler rarely allowed himself to be photographed, filmed or phono-recorded in private situations, all of the sudden, the secret media archive lets him speak in a private tone. "The voice on the tape is low-pitched and somewhat hoarse, with sentences rambling, and breaking off repeatedly into pauses for thought."[45]

This invites for spectrographic signal analysis. There are archival pauses in the historical sense (the event) and as techno-archival event as well:

"The recording was suddenly cut off. Hitler's security men spotted the cords coming out of the window. They raised a fuss, threatening Damen with a gesture suggesting cutting off the throat. According to Vihonen, the security men demanded that the tape be immediately destroyed, but Yleisradio was allowed to keep the reel, after promising to keep it in a sealed container. One of the tapes ended up in the hands of the head of the state censors' office Kustaa Vilkuna, and he later gave it to Yleisradio in 1957. The second tape was kept by Damen himself, who died in 1965. It was found in 1992 by his son Henrik Damen, hidden away in his father's garage."

A copy of the tape was sent to the Institute of Military History of the German Armed Forces. A study of the tape's authenticity was made in the acoustics laboratory of the German Central Criminal Police. But paradoxically, it is exactly such signal analysis in quest of the authentic voice which reveals the monstrosity (in Fact: the Sirenic sonicity) of the human voice when analyzed (and resynthesized) as a techno-physical event.

The American sound artist Seth Cluett once coined the term "temporal dissonance" for such irritations. "Dissonance" in itself is of a sonic-temporal nature (different from simple "dislocation"). Sonic asynchronicities create irritations in the human sense of time (different pace / temporalities / speed).

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[45]   Kirsikka Moring, Conversation secretly recorded in Finland helped German actor prepare for Hitler role, In: Helsingin Sanomat International Web-Edition, *online* http://www.hs.fi/english/article/1076153999513 (accessed March 19, 2013. First published in print: Helsingin Sanomat, September 15, 2004. For a YouTube-reproduction of the document, see: "Hitler 'Talking' To Finnish Field Marshall Mannerheim" = http://www.youtube.com/watch?v=t_Xf3l7RjBk; accessed March 19, 2013

Stefan Gfrörer from German BKA (Kriminaltechnik) identified Hitler's voice by comparison with officially recorded Hitler public speeches. Forensic technology is truly media-archaeological analysis (in Kirschenbaum's sense).[46]

Not only the human is speaking from tape - it is the recording technology itself as well. Gfrörer "compared the speech to a talk Hitler had just previously held and which was recorded by using exactly the same system as in Finland, and the analysis proved that it was Hitler talking."[47]

Hitler's personal assistant who had been present during the train journey could not recognize the recorded voice as specifically Hitler's one - a difference between neuronal and electronic memory. The stored recording of Hitler's conversation with Mannerheim during lunch at the train journey breaks of when suddenly music can be heard - the previous recording of the (radio) tape. The authentification of the recorded voice as Hitler's (which is symbolically rendering a name as meta-data to an audio signal) itself is a media-archaeologial act, based not on human memory (Hitler's former assistant) but on stectography, with signal-detecting and signal-analyzing electronics / measuring instruments. What flashes out, is the physically "real" of acoustics. Different from Roland Barthes' definition of the photographic *punctum*, the signal here is a dynamic one, revealing its evidence only when moving forward, a kind of "punctum-in-becoming" like the cathode ray which creates the impression of an electronic image which in fact consists of nothing but Bergsonean time of duration.[48]

This reminds of the gramophone recording of Heinrich Himmler's "secret" speech to SS men on the *Endlösung*; my controversy with the film maker Romoald Karmaker during the Berlin Berlinale screening of his "documentary" film with the speech being alternatively not rendered from the original recording in the Federal (?) Archives but read by the actor Zapatka.

Different Trains: Traumatic memory triggered by the sound archive

In his novel from 1880, *L'Eve Future*, Vielliers de l'Isle-Adam lets the inventor of the phonograph, Thomas Alva Edison, lament on the sonic information which has been lost in world history. But even the phonograph reaches its limits when it comes to record the purely physical noise, since it is technically too noisy itself: "Ansi, j`eusse blâmé, par exemple, le Phonographe de son impuissance à reproduire, en tant que *bruits*, le bruit ... de la Chute de l'Empire romain ... les bruits qui courent ... les silences *éloquents* ... ."[49]

Such noise becomes expressive of traumatic memory in Steve Reich's minimalistic composition *Different Trains* (1988): acoustic memories of train journeys in the past, train speed sounds as sonic commentary of different tempor(e)alities, rivalling with the mixed-in voices of train porters as oral

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[46] See Matthew Kirschenbaum, Mechanism. xxx, xxx 2010
[47] http://www.ww2f.com/topic/1497-the-conversation-between-mannerheim-and-hitler; accessed March 19, 2013
[48] See Bergson, Matter and Memory, on "vibrations", and Maurizio Lazzarato, Videophilosophie, Berlin (b-books) 2002
[49] Édition Lausanne (L'Age d'Homme) 1979, 36

testimonies. Reich collected recordings not only of American trains from the thirties and fourties, but from Europe as well: „There they sound completely different, they have another whistle, really violent" - "*schrecklich*", as verbally expressed by the composer.

Track I "America - Before the War"; Track II "Europe - During the War" (Kronos Quartet); Track III "America - After the War"

Minute sonic differences here account for the discontinuity inbetween historical epoches. But this mode of experiencing the past probably is not historical at all, since it cannot be expressed historiographically (which is limited to symbolic writing). It is, rather, sonography of the real in cultural time: "The real train sounds, that is all."[50]

The composer's basic idea was that speech recordings generate the musical material for musical instruments." In order to combine the taped speech with the string instruments he selected small speech samples that were more or less clearly pitched and then notated them as accurately as possible in musical notation. The strings then literally imiate that speech melody." Even if this manual transcription into the symbolic score seems to represents human interpretation, in fact it already enacts an inhuman approach to the voice which is the technical operation of the the Vocoder (literally: "voice encoder").

"Built at the Bell Telephone Laboratories of American Telephone and Telegraph (AT&T), this machine was intended for communicating multiple messages to be passed down the same telephone wire simultaneously. But the real message of the medium is this: "[...] it indicated that certain aspects of a vocalization could be subtracted without a listener perceiving any change. Speech could be broken into bits, much like 'the subject' — which, Lacan had earlier announced, 'is no one. It is decomposed, in pieces.'"[51]

The excerpts from testimonies of Holocaust survivors come from the several testimony collections and the train sounds from special recordings; Siren and Warning bell sound comes from Elektra Records Sound Effects.In one of the oral testimonies, in the third act, an aged train porter comments: "but today, they're all gone" <p. 12>. The temporality of the transient sonic articulation which is the medium message of the musical composition here coincides with the notion of history as its content.

In Reich's composition for string quartett and magnetic tape, the train sounds serve as non-human testimony of bygone times, returning to Reich's early speech-archaeological pieces like *It's gonna rain* and *Come out*. The sound of trains from the years 1939-42 (the years when Reich himself made train journeys between his parents in separation between New York, Chicago and Los Angeles) makes him comment that in these years in Europa, as a Jew he would probably have been transported in such trains to a concentration camp.

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[50]   Steve Reich, in: xxx
[51]   Mills 2010: 36, quoting Jacques Lacan, The Seminar of Jacques Lacan, Book II: The Ego in Freud's Theory and in the Technique of Psychoanalysis, 1954 – 1955, ed. Jacques-Alain Miller, trans. Sylvana Tomaselli (New York: Norton, 1991), 54

The first act refers to pre-War trains in America, the second for Europe. He went to the Yale Fortunoff archive and took the audio track, searching for the speech melodies of European Holocaust survivors. The he collected trains sounds from the pre-war US and from Europe.

Trauma, according to Sigmund Freud, is such signals against which the human ear has no defence, which breaks into human perception as radical presence even if cognitively it is known that the signal source is archival recording from times past.[52] The symbolic order of historical narrative then is not capable any more to shelter against such temporal affectation.

But then, Reich destilled samples from the oral voices and sent these archival signals to a Sampling Keyboard which digitally samples and holds signals from natural sources. It has been the computer which helped him to "organize it all"[53] Reich celebrates such signal processing as a liberation from the restrictions of subject-centered historical narrative; if one submits to such sound processing, human attention is diverted from the "he, she, you" to the "it"[54] - a truly media-archaeological aesthetics, a different, non-hermeneutic kind of "understanding", literally, coupled to another temporal field. The temporality of the "Es" is not historical any more, since computational sound processing de-humanizes such voices.

Sometimes, it happens that life assurances still pay money to the dead; digital administration can not differentiate in adressing names between the living and the dead (esp. when subject to the "millenium bug" dates). On the other side there is digital technology as research tools, such as in the European Holocaust Research Infrastructure (EHRI) which recovers the names of thousands of Jews killed in concentration camps so far unknown - by digitising textual and audiovisual records of various administrative and other archival context.[55]But computing itself resonates with the leased IBM machines which helped to organize the concentration camp administration at these years on the German side.

Negative sound as traumatic interval: silence as form of sonic witnessing

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[52]   "Solche Erregungen von außen, die stark genug sind, den Reizschutz zu durchbrechen, heißen wir *traumatische*.": Sigmund Freud, Gesammelte Werke, edited by A. Freud, E. Bibring, W. Hoffer, E. Kris und O. Isakower, London / Frankfurt (Main) 1999, vol. XIII, 29

[53]   "Vorwärts und zurück. Steve Reich im Gespräch" mit Gisela Gronemeyer, in: MusikTexte 26 (Köln, Oktober 1988), 11-15 (11f)

[54]   "<...> eine Lenkung der Aufmerksamkeit weg vom *Er*, *Sie*, *Du* und *Ich* hinaus zum Es": Steve Reich, Musik als gradueller Prozeß, in H. Danuser, D. Kämper u. P. Terse (eds.), Amerikanische Musik seit Charles Ives. Interpretationen, Quellentexte, Komponistenmonographien (Laaber, 1987), 288-290

[55]   See Gerhard Lauer, Die digitale Vermessung der Kultur. Geisteswissenschaften als Digital Humanities, in: Heinrich Geiselberger / Tobias Moorstedt (Redaktion), Big Data. Das neue Versprechen der Allwissenheit, Berlin (Suhrkamp) 2013, 99-116 (109f)

With sound recording in digital high fidelity (due to lossless signal reproduction according to the Nyquist / Shannon sampling theorem), the traditional tight coupling (at court and in legal discourse) of indexical phonographical real presence and witnessing is being undermined.

Arnold Dreyblatt's "memory opera" performance, reading printed names by actual voices, once reimplemented the symbolical rigid signifiers into real living bodies by human re-presencing (different from re-play by phonographic apparatuses) - like the "sonic memorial" of September 11 attack on World Trade Towers 2001, by US Public Radio.[56]

A Compact Disc by Jonty Semper, edited September 6, 2001 (shortly before the attack on the New York World Trade Towers on September 11, 2001: see "radio memorial") allows for the re-play of the recording of "The one minute silence from the funeral of Diana, Princess of Wales" which on September 6, 1997, was broadcasted *in memoriam* Lady Diana on radio and TV.[57]

But just as for the recorded silences in the video-testimonies at the Yale Fortunoff Archive such silence is no articulation of trauma any more but by the very act of recording already the transformation of real into symbolic silence which thereby becomes accessible to the historiographical imaginary.

Whereas traumatic silence escapes recording, the repeatability of recording itself creates a trauma of another kind by its very technological virtue: an irritation of logocentristic "presence". Silence recorded on magnetic tape though makes silence accessible as processual *durée* (in the Bergsonean sense) by its very necessity of a electro-magnetic and motor driven motion.

"Interruptions may then be taken as such "presence effects" insofar as they constitute the attendant material traces of relation within mediation. <...> the nonhermeneutic <...> punctuates the hermeneutic <...>."[58] The equivalent to spatial, material or visual absence is negative sonicity: silence. In trauma studies, pauses and interruptions in recorded speech count as symptoms - symptoms which can better be identified by ultra-sensible and DSP measuring media than by human psychoanalysts. But from the media-archaeological point of view (the "ears" of the recording apparatus), speech and pauses are equally forms of signals. Frequently interview quotes and diary material are anonymized, and "[a] series of dots ... indicates a pause in speech."[59] The *real* involuntary memory (in Lacan's sense) is *arché*-logique (no speech / *lógos*), but articulation by silence. In algorithmic techno-memory practice, there is a "Silence finder" tool in the audio-editing software Audacity which automatically, that is: algorithmically, taggs intentional and non-intentional pauses in speech or sound files. The present text will dis-continue at that point.

[56] See the audio project *Kenotaphion*; www.kenotaphion.org
[57] See Claudia Benthien, Die *vanitas* der Stimme. Verstummen und Schweigen in bildender Kunst, Literatur, Theater und Ritual, in: Kolesch / Krämer (eds.) 2006: 237-268 (262)
[58] Pinchevski, "Levinas as media theorist"
[59] Ben Anderson, Recorded music and practices of remembering, in: Social and Cultural Geography, vol. 5, No. 1, March 2004, 3-19 (18)