["ON ICONICITY"]

ANALOGUE DAYS
Photography without the painterly hand
Historicism and the photographic archive (analogue times)
Photography, memory and the archive: Heidegger´s distrust
Temporal indexicality: The "moving" photographic image
Stilled time: The "moving" photographic image

INTERFACE KNOWLEDGE
For a media-archaeological interface aesthetics of difference
Visual knowledge (CyberAntarctic)
Interfacing time
Digitally interfacing the museum from within: *Metasyn*

THE DIGITAL REGIME
Photographic In/formation
The archival from within photography (the digital regime)
Satellite "imaging"
Between reading and scanning the image: pixel
Images from data

BIT-MAPPING
Physical and logical "space"
Sorting / Searching
Bit-Mapping

THE INSISTENCE OF THE IMAGE ARCHIVE
New "anarchival" options in re-membering digital images
Sorting photography: between image-based sorting of photography and logocentrism (George Legrady)
Sorting images: *Pockets full of Memories* (Legrady)
Temporalizing the archive: From space-based to time-based archives
Flexible access to the chrono-archive

DE-HISTORICIZING ART HISTORY
Experimentation with the art historical archive: histogrammatology
Visual im/mediacy: sorting images

DIGITAL ADDRESSABILITY
"Social" archives in Web 2.0?
From semiotic analysis to cultural analytics of the moving image
Dis/order in photographic archives
The acceleration (temporalization) of the archive
New memory options of image retrieval
Visual im/mediacy: Towards a dynamic technology of photographic (and moving) image retrieval

ARCHIVE, STORAGE, ENTROPY. TEMPOR(E)ALITIES OF PHOTOGRAPHY
Inbetween storage, memory and archive
Archives as non-narrative alternative to historiography
Archival resistance against *streaming data*

The multiple embodiments of the archive
Photography in the archive: between the indexical and the representational
"Cold memory"? Archival times and different tempor(e)alities of photography
Timeless? Entropic *versus* digital photography
Archival nostalgia? The analog photographic print
Historicism and photography
Dis/order in photographic archives
The acceleration (temporalization) of the archive
Image archives on the threshold of their digital approachability

AN ALGORITHMIC APPROACH TO CINEMATOGRAPHICAL IMAGERY
Visual archiving: Sorting and storing images
Moving image retrieval
Excavating the cinematographic archive
Kinetic im/mediacy: towards a dynamic technology of moving image retrieval
A real archive of movements: The *Encyclopaedia Cinematographica*

ANALOGUE DAYS

Photography without the painterly hand

- liberating the hand for more experimental drawing and painting as a non-realist art form; "the instrument chronicles whatever it sees, and certainly would delineate a chimney-pot or a chimney-sweeper with the same impartiality as it would the Apollo of Belvedere" = Henry Fox Talbot, The Pencil of Nature (1844), explanation to plate II *View of the Boulevards at Paris*; idem, Some Account of the Art of Photogenic Drawing, or, The Process by Which Natural Objects May Be Made to Delineate Themselves Without Aid of the Artist's Pencil, in: Photography. Essays and Images: Illustrated Readings in the History of Photography, ed. Beaumont Newhall, New York (The Museum of Modern Art) 1980), 23–31; Richard Beaudoin / Andrew Kania, A Musical Photograph?, in: The Journal of Aesthetics and Art Criticism, vol. xxx (2012), 115-127

- Talbot 1844: "the whole cabinet of a Virtuoso and collector of old China might be depicted on paper in little more time than it would take him to make a written inventory describing it in the usual way. The more strange and fantastic the forms of his old teapots, the more advantage in having their pictures given instead of their descriptions"

- project "Picturing Aura," involves a media archaeology of aura-imaging technologies, optical instruments (Jeremy Stolow, Montreal). Benjamin tracing the photogtraphic aura / spiritistic aura-tracing by photography itself; Wolfgang Hagen on "medium" fixation in early photography, separating photochemical noise from what looked like auratic appearances

Historicism and the photographic archive (analogue times)

- while historical observation (and recording) tends to narrativize events, ultra-

short photographic exposure reveals the accidental.[1] It is the contingent which short-time photography is able to catch with diminuishing time of exposure. The tempo-real can be catched this way which has escaped symbolic notation (historiography) so far

- undoing historicity? photographic memory not immaterial but bound to a chemical storage medium. *Temporal* transcendence of materiality is a faculty of operative media technologies

- photography, understood with Roland Barthes' *La chambre claire* as a photonic emanation of an object, memorizes rays of light reflected by this very object to the viewer in the present - a delayed transfer of what otherwise vanishes into the dark; inscribes physical tempor(e)ality into the image, while computational imagery exorcises time parameter in favor of its mathematical / numerical, therefore: calculabe reverse, spectral frequencies; different from painting as cultural technique, algorithmically generated *imaging* (such as fractals) exclusively emerge within the machine, by-passing human vision: "Raytracing algorithms calculate paths and angles of light beams resulting in the pixel-by-pixel buildup of brilliant hyper realistic pictures; radiosity algorithms calculate diffuse reflections from various objects resulting in a growing luminosity within a given picture"; while mathematics involved in raytracing operates with laws of light reflection and refraction, radiosity based on cosine law formulated by Johann Heinrich Lambert's *Photometria* (1760) = Holl, in: DHQ

- since light emission itself can be photographically sustained in the time channel of tradition, the emphatic temporal distance as described by historiography shrinks to an affective moment of Benjaminesque *Jetztzeit*; the past flashes into the present

- photographic image is characterized by the physical irreversibility of the inscribed photonic moment which authorizes its temporal indexicality; for the same reason any photography is subject to another temporal destiny which is visibly known as chemical entropy.

- temporal index does not root in the imaginary "referent" of the photographic image (Barthes) but in the material irreversibility of the en-lightened photosensitive chemistry (argument Hagen, "Entropie"), fixed only in the moment of delevoping the negative; chemical photography irreversibily degrades in luminance; moment of exposure to light momentarily in-forms the negative in Heider's sense (medium / form, loose / tight coupling), crystallizing silver halegonite

- section of the medical film archive of Charité Hospital, Berlin, generated by a secret medical film project between 1941 and 1945 at the Berlin university hospital Charité, thrown by the SS into lake Stößensee near Berlin when the Red Army approached Berlin; divers detected these films in 1993; just three of several hundred film rolls could be deciphered at all, one of them showing on

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[1] Dolf Sternberger, Über die Kunst der Fotografie, in: Wolfgang Kemp, Theorie der Fotografie, vol. II.: 1912-1945, München (Schirmer/Mosel) 1979, 228-240 (xxx)

the basis of heavily damaged film material a naked man who performs several movements, apparently directed by orders from outside. "More cannot be seen" = Keller 2000

Photography, memory and the archive: Heidegger´s distrust

- "World-withdrawal and world-decay can never be undone. The works are no longer the works they were. It is they themselves, to be sure, that we encounter there, but they themselves are gone by" = Heidegger, Origin, 166

- Barthes' notion of the photographic *punctum* = experience of by-gone presence (*Dagewesenheit*)

- "If for Heidegger the *Gestell* appears as a kind of `photographic negative' of *Ereignis*, Benjamin insists that this negative imprint must be developed" = Rebecca Comay, Framing Redemption: Aura, Origin, Technology in Benjamin and Heidegger, in: Ethics and Danger. Essays on Heidegger and Contintental Thought, Arleen B. Dallery and Charles E. Scott (eds.), Albany (State Univ. of New York Press) 1992, 139-167 (161), referring to M. H., *Vier Seminare*, Frankfurt/M. (Klostermann) 1977, 104)

- "What differentiates images from the `essences' of phenomenology is their historic index [historischer Index]. (Heidegger seeks in vain to rescue history for phenomenology abstractly, through `historicity' [Geschichtlichkeit].) These images must be thoroughly marked off from humanistic categories, such as so-called habitus, style, etc. For the historic index of the images doesn't simply say that they belong to a specific time, it says above all that they only enter into legibility [Lesbarkeit] at a specific time. And indeed this entering into legibility constitutes a specific critical point of the movement inside them. Every present is determined by those images that are synchronic with it: every Now is the Now of a specific recognizability [Erkennbarkeit]" = Gesammelte Schriften vol. 5 (Das Passagen-Werk) N 2a, 6 = p. 577, quoted in: Fynsk, 116; read the "entering into legibility" from the point of view of the Lacanian *réel*, i. e. as a non-discursive practice. No metaphysics, but administration. Next to the work of art transgressing the threshold of the museum/frame comes the museum's institutional practice of inventarizing, labelling and cataloguing of the objects, thereby providing the object with a supplement of information (localization, dating, authorization, authentification) as materialized in labels ("Anhängern"), literal *parerga*. What appears to be an archival texture exterior to the object is already at work there as primary inscription, as deep cut(ting edge)

Temporal indexicality: The "moving" photographic image

- temporal indexicality; inherent limits of photography which technically can always only be a snapshot of time - unless long-time exposure, like in the early days of photography and in Bragaglia's photo-dynamism, as well as in Ètienne-Jules Marey's serial chrono-photographical exposures; cinematography composed of moving stills

- long-time exposure of a cinema film screening results in the screen as white square.[2] Diese Zeitlinse erzeugt eine Unschärfe nicht nur im optischen, sondern auch im temporalen Bereich, eine spezifische Variante der Bergsonschen *durée*. Die temporale Indexikalität, die (allem Augenschein zum Trotz) jede klassische Photographie mehr zu einem Zeitzeichen denn zu einem ikonischen Bild macht, löst sich hier im Zeitintervall selbst auf - ein ästhetisches *reverse engineering* der langen Belichtungszeiten am Ursprung der Photographie.]

- different from kinematography which is not only in time but embodies a temporal extension in itself; inbetween: chronophotography

- long time exposition (the early temporality of the photogenic process) introduces times as (Bergsonean) endurance into the image, somewhat comparable to John Cage's composition of 4'33 minutes silence for piano

Stilled time: The "moving" photographic image

- photographic signal inscription kind of measuring time; temporality of the photograpic plate is latency; momentary flash (or rather long exposure in early pre-kalotypic photography) embodying different temporealities

- temporality which transcends the inherent limits of photography which technically can only be a snapshot of time (unless long-time exposure, like in the early days of photography and in Bragaglia's photo-dynamism), in Ètienne-Jules Marey's serial chrono-photographical exposures; kinematography still composed of intermittance-moved stills

- Ridley Scott's film *Blade Runner* (USA 1982, based on the novel *Do Androids dream of Electric Sheep?* by Philip Dick) is meant to test replicants against humans. In its most advanced version (the "Nexus-6" series), the replicants are infused with memories derived from (other) humans. In the first private scene between Deckard and Rachael, she carries a photograph claiming that this shows her as a young child with her mother. Deckard reflects on the function of such photographies in infusing replicants with memory - not in the sense of simple data storage, but in way closer to G. W. Hegel's differentiation between mechanical memory and internalized remembrance (Deckard, in the German translation, speaks of "Erinnerung"). *Erinnerung* is a quality which differentiates computer memory from human skills of digesting perception into recall. When she wants to know if she is a replicant, Deckard tells her a scene from her most intimate memory to proove that her remembrance is an implantat. Finally, Rachel throws the mother-and-child photography on the table and leaves. A minute later, when Deckard takes a closer look at that photography, shadows slightly move across the surface, subtly implying an animated picture / Burns-Effekt; Claerbout / which is a dynamic index to the temporal real - as if his own "living" memory (the difference between remembrance and technical memory) was stimulated (or he himself was reminded that he might be a replicant himself)

[2] See Matthias Flügge u. a. (ed.), Raum. Orte der Kunst, Nürnberg (Verl. f. mod. Kunst) 2007, 304 ff.; Hiroshi Sugimoto, Time exposed, catalogue Kunsthalle Basel (1995), ed. Thomas Kellein, Stuttgart 1995

- "Cinema, according to Lev Manovich, The language of the New Media, Cambridge, Mass. (MIT Press) 2001, is a discrete medium which slices time into 24 still pictures per second a bit like the <phonetic> alphabet slices sound into twenty something letters

- Man Ray, photography entitled *Essai de simulation du délire cinématographique* (1934)

- In "Director's cut" version of *Blade Runner* film, a different photography turns up, once more supposed to show a childhood memory of the human/replicant, in fact a house garden scene. At one point in the close-up zoom on this photography, the leaves in the garden tree on the supposed memory photography of Rachel's youth slightly move which is a dynamic index to the temporal real / Siegfried Kracauer, *Theory of Film*, exemplifying the scene of rain drops falling on a [Pfütze]

Not only for Blade Runners, but to the film audience as well this leads to irritations of human confidence into the clear distinguishability of artificial and human memory / Turing test

- media-induced irritation at work: both the actors of the Blade Runner and of the Replicants are indifferently humans; second: shivering of the leaves on the photographic still ("still movement") for sure the actual chronophotographic effect of the kinematographical apparatus

- photographic *punctum* corresponds with the temporal *momentum*; difference between the photographic print (or negative) and the videoframe *still*. Is there (a) stilled time in electronics? Videodisc can contain tens of thousands of stills; an electronic "still" (different from a print taken out of a chemical film) never still, always flickers, as a function of the pure time of the cathode tube ray, thus: permenently being re-generated

In media-archaic photography, it took a long time interval for the object to get fixed by interaction of light and the silver grains on the photochemical carrier. For humans and other animals, this meant suspending any movement, almost: fossil like freezing during a portrait session, becoming a statue for a certain interval of exposure. Whoever nowadays, in the age of photographic clicks, undergoes this archaic experience in face of a <Lochkamera>, makes this experience of time itself passing as still - with the curious side-effect that in the background things happen which do not get inscribed like in the famous Daguerrotype of the Boulevard du Temple in Paris which looks empty except one human sitting in a chair to get his shoes polished.

- a digital photography of a media-archaeological artefact and a movie of the same artefact; phenomenologically they look the same, but chrono-ontologically they embody totally different essentialities. A further difference is the filming of photography as opposed to the photographic print itself: The print endures, while is cinematographical recording passes both *in* and *with* time. And let us not forget, in digital video beamer projection, all is a function of data arrays which are being refreshed permanently anyway (temporally equalized):

- acoustic tape delay mechanism

Acoustically, the time which passes becomes perceivable, while the image / object seems to remain still. In acoustic space, "still" has a different meaning.

- time which passes vs. endurance. As digital image projected by a beamer, the seemingly photographic image reveals its processual character; it has to be re-generated out of computer storage permanently / dynamically. There is no "still image" in analoge video space and digital representation

- asymmetry within the so-called audio-visual media disclosed in the filmic genre of "still movies": long shots with quasi-photographic endurance. One can cut out a single frame in a film, copy it and produce a long (seemingly) immobile sequence (in fact, the medium - be it mechanically the cinematograph, be it electronically the video monitor - moves constantly), but the accompanying audio track, cut out of one frame, in fact is a sample in its technical sense (the sampling theorem) which - being reproduced, would rather results in a single signal of sinuisoid quality. An image (f. e. a portrait) can be visually preserved in the "photo film", but not a spoken word.[3]

- online-Journal *History of Photography*:
http://www.informaworld.com/smpp/title~content=t714595773
Heft "Photography and Movement", Editorial: Ingrid Hölzl
Online publication date: 20 January 2011

INTERFACE KNOWLEDGE

For a media-archaeological interface aesthetics of difference

- visual computer interface does *not* hide its computational essence; whatever appears on monitor, actually *is* a directe enunciation / function of algorithms and codes, just different mapping (electronic transduction / symbolic transcoding)

- whenever an alphanumeric symbol on the keyboard as part of a string (a word, a sentence, a text, a formula, a graphic notation) is pressed, the single character is transformed into an electro-physically coded signal. A transformation (or even "transsubstantiation") takes place, loosing "meaning", gaining "indexicality"

- "[...] most approaches to 'new media' emphasize one side of the screen or the other; to exaggerate slightly, the screen divides new media studies into visual culture studies and media archaeology. Visual culture studies stem from the Anglo-speaking academy and generally treats the interface, or representations of the interface, as the media (or filmic/televisual/priint representations of this interface). The second approach, media archaeology, although inspired by Marshall McLuhan and Michel Foucault, is mainly Germanic. Taking as its ground zero McLuhan´s mantras of "the medium is the message" and "the

[3] See Gusztáv Hámos / Katja Pratschke / Thomas Tode (ed.), Viva Fotofilm. bewegt/unbewegt, Marburg (Schüren) 2010

content of a medium is always another medium", it concentrates on the machine and often ignores the screen´s content. Archaeological studies critique visual culture studies´ conflation of interface with medium, representation with actuality; visual culture studies critique the archaeologists´ technological determinism and blindness to content and the media industry." = typescript Wendy Chun, Communication in the age of fiber optics

- "In HI-VISUAL, objects which the system deals with such as data and program are represented in terms of icons. Programming is carried out simply by arranging icons on the two-dimensional display screen and specifying flow of data"[4]; the icon bears resemblance with the coding as a kind of visual short-cut of algorithmic lines

- Williams tube, not only visualizing but actually physically performing the storage / time-delay functions

- "interface" knowledge transforms from intransitive (see Latin *transitivus* = "transitive, passing over") to transitive communication - communication with no interface any more, like the former signal recording and transduction for re-play

Visual knowledge (CyberAntarctic)

- observer moves data clouds: "We do not have an interface anymore, a mechanical interface, in the real world, we have interfaces in the network, the dynamic network"[5]

- telematic communication generates depersonalized forms of interfacing; the interface looks back (Iris scan, eye-tracking). In media culture, term „interface“ suggest an inbetween of machine and human as communication partners; "Turing test" still required an interface between man and machine, a teletaper (as proposed by Turing), since direct coupling between man and machine is (still) not yet possible.[6] But what if the computer monitor does not simply translate information from computer hard- and software to human visibility, but is the message of its internatal data processing? Early C64 computer game images have been direct *outsourcing* of the RAM

Interfacing time

- interfacing *time-based* knowledge - the interval; by quantification, time becomes divisible into computational bits

- Dan Graham´s video-installation *Present - Continuous - Past(s)* (1974),

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[4] Tadao Ichikawa / Masahito Hirakawa, Visual Programming - Toward Realization User-Friendly Programming Environments [*Proceedings 2nd Fall Joint Computer Conference, 1987, 129-137], in: Glinert (ed.) 1990, 59-67 (59)

[5] Christian Huebler, in: Paolo Atzori, Discovering CyberAntarctic: A Conversation with Knowbotics Research <13-3-96>, online http://www.ctheory.net/text_file.asp?pick=80

[6] Alan M. Turing, Computing Machinery and Intelligence, xxx

interfaces media time and human presence by delay

- temporal interfacing: Bill Viola´s video-installation *Heaven and Earth* (1992), two monitors mirror each other, one (with a baby´s face) mirroring the other (a old, dying woman´s face) = Belting 1995: 97, Fig.: 96

- compiler of higher programming language = software itself, functioning as *internal interface* already, allowing for a communication between symbolic source code and machine language

- computer monitor "transforms internal electromagnetic states via data buses, oscilloscope, fluorescent material etc., to electro-magnetic states in the visual range of wavelengths. A purist may write down a [partial] differential equation of the whole thing on a microscopic level where the notion of an interface seems to become rather arbitrary." = Diebner[7]

- in imperative computing languages, "[a]lgorithms are metaphorically dumb and blind because they cannot adapt interactively while they compute"[8] - *versus* "life coding", allowing for dynamic operative human-machine interface

- HTML as interface between legible text and markup tags; formalistic *versus* the temporal interface

- interface is a “'zone of indecision’ between the inside and outside” (Gérard Genette); doorways = binary relays

- interfaces have their own *internal* reality as processual algorithms

- re-arrange order: not "HMC" but Machine-Human-Communication (van Treeck)

- skeuomorphisms = derivative object that retains ornamental design cues from structures that were essential functions of the original; complete surface emulation = "semulation" (van Treeck); surface / subface = "Unterfläche" (Frieder Nake); task of media archaeology: to un-mask, de-interfacing

Digitally interfacing the museum from within: *Metasyn*

- *Metasyn* = "an interactive visualization that gives visitors an insight into the collection of the Museum of Contemporary Art in Roskilde, Denmark. The content of the visualiaztion is based on the museum's database and the analogue video and sound sequences that have been digitzed to date. The physical interface constist of a six-meter-wide, slightly concave screen and a handheld poiting device that rests on a cylindrical mount. On the screen, more than 1,000 physical objects from the ocllection and more than 2,000 digitized sequences originating from those objects are represented as icons in three-dimenskional space. Using the pointing device, visitors can look around and

[7] "Preface", in: Hans Diebner, Timothy Druckrey and Peter Weibel (ed.), Sciences of the Interface. Proceedings of the International Symposium

[8] Peter Wegner (Brown University), Why interaction is more powerful than algorithms, in: Communications of the ACM, vol. 40, no. 5 (May 1997), 80-91 (82)

nagivate quickly through the collection" = Carl Emil Carlsen, Metasyn, in: Re.Action. The Digital Archive Experience, ed. by Morten Sondergaard, Aalborg (Aalborg UP) 2009, 89-97 (89)

- chronological hanging of pictures and placing of monuments in cultural museums, such as started past 1830 in the Alten Museum in Berlin (in sight of Hegel's former house) is philosophically reflected in the final passages of Hegel's *Phenomenology of Mind*.[9] It is the historical (progressive, evolutionary) order of traditional museum object placement which is being de-constructed by the recombinant computing power of the virtual, that is: algorithm-based museum, resulting in a kind of dynamic, never-final archive:

"Digital archiving could break up the alliance that the museum has maintainted with history or even historicism since 1800. The chronological sequence, as the emptiest of all kinds or order in which stored things are to be put, could be replaced by an order of co-presence once their combinatory connections were located."[10]

- "should digital archives give the museum combinatory power" = Kittler 1996: 74

- see *Rijksstudio* = developed by the Media Lab at the Rijksmuseum Amsterdam tpo become one's own virtual curator[11]; and Tate Britain, initiative *Tate Collective*, funded by the xxx Foundation: In a middle gallery room, experimental space for virtual sorting of images, experimenting with other forms of hanging alternative to e. g. St. Petersburg hang; connecting to youth experience in current media culture: web photo, text and video microblogging platform like www.tumblr.com

- „The Virtual Curator (Beardon & Worden) is an authoring environment, currently under development, which enables the user to work within the metaphor of the museum; developed as software in the Rediffusion Simulation Research Centre, University of Brighton

- "The user has access to a museum store of objects that are unclassified. They are able to classify the objects and sort them into groups. <...> The software <...> focuses on the process of history making and offers the user an active role. <...> <...> Using the metaphor of the museum in this context means that the institution of the museum is seen as a site where authenticity, ownership, classification and contextualisation are treated as problematic, ambiguous and paradoxical. <...> There is no primary and secondary classification of objects. This a point of departure from existing virtual museums where the objects of display are described as primary and `contextual´ material as secondary. Through the Virtual Curator the museum as an instituton is questioned by giving more power to the user. [...] Visual language then becomes more than illustration. On a theoretical level this has meant rejecting photorealism which

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[9] Kittler 1996: 68, referring to: Georg Wilhelm Friedrich Hegel, Phänomenologie des Geistes, ed. by Johannes Hoffmeister, Hamburg 1952, 563 f.

[10] Kittler 1996: 75

[11] https://www.rijksmuseum.nl/en/rijksstudio

implies control and closure and, instead , finding other means of making statements. Collage/montage offers a way of ordering and communicating where the illusion is qualified and the constructed nature of the image is recognised“ ; Andy Warhol proclaimed: *The best museum is a department store*[12]; trading of commercial commodities has even developed the concept of „chaotic storage“ which corresponds with the function of Random Access Memory within computing

THE DIGITAL REGIME

Photographic in/formation

- two complementary approaches to the conservation of analogue memory carriers. The one cares for preserving the physical, especially chemical and electro-magnetic properties of the concrete media body - since all media technologies are hardware in the first place. The other, sometimes opposing approach is to preserve media-based memory as information, up to the extreme point of view that the material body might be abolished after its essential transformation into its pure binary information units.

- to which degree archival authority of a record still depends on its material physical embodiment; importance by which carrier one generation passes on its information to the next: "We no longer collect the carriers, clay tablets, books or floppies, just the information"[13]

- two photographs: chapel of St. George near Dobralak in the Rhodope mountains of Bulgaria (near Plovdiv). One photograph from Mai 2004 shows the unrestored chapel, the other (August 2010) its renewed state. *Geschichtlichkeit* versus *Historie* (with Martin Heidegger)? But the medium of photography is indifferent against the tempor(e)ality of its referent; its historicity lies in the entropy of its own physical state. Against this, digital photography is a-temporal, carrying the temporal trace not in its information (which is its binary essence), but in the hard- und software into which this information is embedded - thus linking to the scriptural, alphabet-based, that is: coded systems of symbolic records.

- Foucauldean sense of *archive* turns out in digital, that is: computational photography: "[I]n our time, history is that which transforms documents into monuments. In that area where, in the past, history deciphered the traces left by men, it now deploys a mass of elements that have to be grouped, made relevant, placed in relation to one another to form totalities. There was a time when archaeology, as a discipline devoted to silent monuments, inert traces, objects without context, and things left by the past, aspired to the condition of history, and attained meaning only through the restitution of a historical discourse; it might be said, to play on words a little, that in our time history aspires to the condition of archaeology, to the intrinsic description of the

[12] Intro zur Aufsatzsammlung: Leegte / Emptiness, in: Mediamatic 3#4 (Juli 1989), 195

[13] Tjebbe van Tijen, We no longer collect the Carrier but the Information, interviewed by Geert Lovink, in: MediaMatic 8#1 (translation: Jim Boekbinder)

monument = Michel Foucault, Archaeology of Knowledge, transl. A. M. Sheridan Smith [*1972], London / New York (Routledge Classics) 2002, "Introduction", 3-19 (7f)

- "Evidently a different nature opens itself to the camera than opens to the naked eye."[14] Significantly in the English translation Benjamin's term "technische Reproduzierbarkeit" turns into "mechanical reproduction", thus unwillingly reminding of the difference which opens with digital reproduction: a mathematization of the photographic process, a different archive. Media archaeology is about the mathematical / symbolic logic as well, not just about engineering in the traditional sense any more. The mechanical (and then techno-mathematical) gaze opens an archive by making visible to humans what otherwise escapes the human optical sense: photo-micrography and the dynamical time axis manipulation by photography (chronophotography, slowing down and fast forwarding of motion).[15] The archive of different temporalities opens, "declassifying" time-deferred worlds: an world of what has been hidden (*secretum*) while existing nonetheless - photo-*aletheia*. Technical *poiesis* in the sense of ancient Greek *techné* as re-definied by Martin Heidegger. Both artistic and technical creations are modes of bringing forth, interrelated within the machine.[16]

- in *The Gutenberg Galaxy* McLuhan links the triumph of Renaissance perspective to the rise of print culture, which correlates the mathematization of the image (previous to digitalization) with symbolical / combinatorial machines (the *abecedarium* of the printing press)

- once signals mechanically engraved (phonograph) or magnetically embedded (magnetophon, videotape) on material carrier have been transformed into digital, immaterial information, can be (virtually lossless) "migrated" from one storage computing system to another

- archival endurance not monumental fixation any more (*stasis*), but by dynamic refreshing

The archival from within photography (the digital regime)

- with mathematization of matter into informational bits, its entropic temporeality transforms: "Time no longer has physical meaning."[17] Skadden's

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[14] Walter Benjamin, The Work of Art in the Age of Mechanical Reproduction [1936], in: Hanna Arendt (ed. and introduction), Illuminations, London (Fontana Press) 1973, 238

[15] See Emely Godbey, The cinema of (un)attractions: microscopic objects on screen, in: John Fullerton / Jan Olsson (eds.), Allegories of Communication. Intermedial concern from cinema to the digital, Rom (John Libbey) 2004, 277-298

[16] Martin Heidegger, Poetry, Language, Thought, trans. Albert Hofstadter, New York (Harper and Row) 1975, 64. See Malin Wahlberg, A Relative Timetable. Picturing time in the era of new media, in: John Fullerton / Jan Olsson (eds.) 2004: 93-103 (101 f.)

[17] Elizabeth Skadden, Collapsing New Buildings, Master Thesis, Rhode Island

installation *Steenbeck Loop* reminds of a time figure which literally adheres to the materiality of celluloid film: "I made 16mm films and became anamored with its ability to express time with a physical presence. Film is measured in feet; it gives time a measure of distance" = ibid.; Steenbeck film editing desk allows for cuttering but is time-consuming, requiring rewinding of the spool. In digital editing (AVID), cutting becomes non-linear, allowing for instant addressing of the image data memory

- analogue photography by its very materiality inscribes traces of time, whereas in digital photography, the temporal index becomes a stamp, a date without physical evidence of aging

- notion of "digital photography" = metaphorical, since its digitality can (in HD resolution) not be perceived by human eyes; a former single physical medium like the photographic image as print does not exist behind the surface of computer interfaces but as a data format, an array of bytes which are adressed and processed algorithmically

- digital photograph preserves the iconic quality while loosing the indexical trace; indexicality itself of a different kind. While the analogue photographic print keeps a physical trace of the past / passed light signal, recording the light intensities, the digital pixel keeps a schematic, mathematically abtracted relation to their generating (and then sampled) analogue signals - *diagrammatic indexicality*; digital image: raw pixel data as nondiscursive units; behind: binaries. "[W]hile the pixel can be conceptualized as the technical basis for the meaning contained in the image, from a still lower level, the pixel *is* the meaning contained within the lower level system" = Rory Solomon, Last In, First Out. Network Archaeology of/as the Stack, http://amodern.net/article/last-in-first-out

- Foucault's "archive" is a diagram (Deleuze); computational networks embody an operative machine, still topological (graphs, nodes) but with the additional dimension of temporal processes

- with electronic television, the human eye synthesizes the "flying spot" into an image. "A machine can capture the same image, without any consciousness or experience of the form"[18]; televisual image "has to be established and sustained onscreen moment by moment. With transmission, images and sets of images pass the time and fill out the current: in this sense television is always "live". <...> scanning cannot deliver an image all at once - its composition is always in process, and a "stable" frame can be instantaneously switched midway through"; different from digital image: "Although pixels can retain luminosity long enough to await the next scanning cycle and thereby approximate the succession of discrete filmic images, the fact that no image is ever constituted entirely in a single instant grants television a range of technical options for framing and editing, including incision and torque of the

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School of Design, <year?>, 66

[18] Harun Farocki, Reality Would Have to Begin, transl. Marek Wieczorek / Thomas Keenan / Thomas Y. Levin, in: Documents 1/2 (Fall / Winter 1992), 136-146 (142), here referring to: Vilém Flusser, Für eine Philosophie der Fotographie, Göttingen (European Photography) 1984

image´s surface" = Richard Dienst, Still Life in Real Time. Theory after Television, Durham / London (Duke UP) 1994, 20 f.

- Photographic signal recording discrete (silver grain crystals) but stochatically distributed; no coded "elements", therefore no "inscription" in the alphabetic sense of writing; an analogue measuring of time, opposed to the familiar symbolic registration of past events in alphabetic writing. The non-linearity of photo-archival memory separated this aggregation from the smooth continuity effects of historiographical narrative

- digital media: the symbolical order and the signal-based "real", miraculously converge; computer, by digital signal processing (DSP), is capable now of emulating all "analog" happenings in the real physical world (which before only the "analog media" like gramophone and video could perform) by means of algorithmically processing the strictest of all symbolic, in fact: alphabetic regimes, which is the binary code; ultimate algorithmic temporalization of photographic memory

Satellite "imaging"

- Lisa Parks, Cultures in Orbit: Satellites and the Televisual (Duke University Press 2003)

- project Experiments in Satellite Media Arts (ESMA), from June 18 - July 1 at migrating art & science lab MAKROLAB, curated by Marko Peljhan and stationed in rural Scotland from May through July 2002, "[...] downloading and manipulating satellite images, raw satellite television feeds, and electronic/digital sounds in an effort to generate a series of "orbital animations" that represent and comment upon contemporary global conditions" = http://www.artscatalyst.org/htm/makrolab.htm

- satellite "image" does not exist in the iconic sense any more, rather dissolves into various practices of sensing, sampling, computing, cache storing, transmitting to ground stations; only there the data stream is processed into image format (directed to human perception), altered, combined, colorized, "and stored/archived or put into circulation" = E-mail Lisa Parks, 4th December 2000

- media-archaeological vision of the "scanner" aesthetics of technically reading images (with the satellite camera being the archaeologist, like for Cleopatra´s underwater traces)

- technical *archive* (in Foucault's sense of that which defines what can be seen at all) is neither masculine in the traditional way nor feminine in a post-structural way, but unfolds an area of techno-machinic neutrality like mathematics before

- Galilei´s use of the telescope: see what no human eye could have seen before, and at the same time; the autority of such telescropic images questioned the human ways of authentification. Looking into the sky, the telescope made him see things otherwise unimaginable; at the same time,

Galilei already envisioned the reverse point to view, how the earth might look from the moon´s perspective (his book *Siderus nuncius* from 1610)

- satellites "extend" - or rather genuinely new form of *imaging* - epistemologies of the visible and the real because they have been used to produce/expose "excavate" (media-archaeologically) matter that was never imagined before as part of a field of vision including phenomena in deep space, layers of the earth's surface, weather patterns. Satellite sights radically disembodied vision like radio / television previously; closer to abstract expressionist paintings of Mark Rothko than to photographic realism; technical process of signal transduction (analog) and signal sampling (digital) that occurs with the flow/transfer and encoding/decoding of electronic im/pulsees; rather translating than simply transferring signals from one site to another = notes on Lisa Parks, lecture *Mixed Signals: Media Infrastructures and Cultural Geographies* (Vortrag Einstein-Forum, 20th June, 2xxx

- Horst Völz' development of an digital image data intermediary tape recorder in outer space (the Phobos mission)

Between reading and scanning the image: pixel

- Angela Bulloch refers to a sequence from Michelangelo Antonioni´s film *Blow Up* (1966) where the protagonist, a photographer, hiding behind a tree, unintentionally seems to have recorded a murder when later developing the negative. But in trying to identify the spot, the closer the camera looks, the less is the apparent murder an evidence. The artist extends this process of identification by yet another magnification, enlarging the digital scan of this scene in great blocks of its single pixels and thus exploding the image within a sequential modular system of her purpose-build so-called *pixel boxes*, where one pixel is represented in a 50 x 50 cm monitor which are attached to complex RGB lighting systems which can be generated and programmed with any digital information; installation BLOW_UP T.V. of Angela Bulloch in the gallery Schipper & Krome, Berlin, September to November 2000; desillusioning the image betrayal of the human eye, reavealing the discrete scanner-gaze of the computer which is media-archivological, looking at the discrete units of the archival regime, not looking just for letters any more. The pixel modules also point at the fact that digital images are hyper-indexically composed by pure information, as opposed to the referential image like the classical photography which still suggest a pre-discursive real

- once digitized, images can be visually calculated and internally navigated. After all, why should we always try to force the semantic criteria of human image understanding upon the computer? On the contrary, the entirely different criteria of image similarity in computing may leed to unexpected insights in visual culture. Beyond meta-dating, no longer force a foreign medium (texts) upon images, but approach in their own mediality

- some perceptual processes operate upon data on the screen in a direct, „bottom-up“ manner "by examining the data in very brief periods of time (utilizing little or no associated memory) and organizing it automatically into such features as edge, color, depth, motion, aural pitch <...>. Bottom-up

perception is serial and „data-driven“, and produces only short-range effects" = ibid., 37

- electronic tunnel microsope does not actually transfer images of the atomic surface of matter, but analyses its object by matching data statistically and reprsenting these calculations as images - just like bats don´t perceive space iconically, but by echo orientation in space[19]

- pixel = the smallest conceivable picture element, which makes sense in a semantic way only when appearing within a group. When the square of light made by a single pixel is 50 x 50 cm, the distance between the viewer and the group of pixels must be large in order to discern the image. "I want control over every pixel" (Andreas Menn); option for search enginges: visual search with precise targeting, down to each pixel in an image

- David Gordon, *24 hours Psycho*: media-archaeologically undermining the story by slowing it down; Angela Bulloch, Pixel Works, dissolving a cinematographic frame, after digital sampling, into macro-pixels

Images from data

- media archaeology observes images not iconologically, but with the "cold gaze": as lots of data (once scanned into digital space), thus calculable (rather than akphrastical narrative). "Evidently a different nature opens itself to the camera than opens to the naked eye."[20]; Ernst Jünger, *Der gefährliche Augenblick*

- media archaeology akin to the gaze of the optical scanner; "culture-free images" (Claus Pias); close to radar which is rather a "system of measurement rather than communication"[21]. Radar = analogue imaging technique rendering on-screen the surrounding area of an antenna, while on the level of signal transfer it operates with discrete impulse- and duplex technology. Thus the radar image is rather analytical (a measuring device) than a medium of representation, of projection (like mass media)

- gaze of the camera (Dziga Vertov, "Kinoglaz") or the monitoring system (instead of the panoptical regime: data patterns, clustering, punched cards; poster DEHOMAG Hollerith; "sehende Maschinen"

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[19] See E. Gal, Geschichten vom Finden, in: Schattenlinien No. 4/5, vol. 2, issue 2 & 3 (1991), 3-35 (6)

[20] Walter Benjamin, The Work of Art in the Age of Mechanical Reproduction [1936], in: Hanna Arendt (ed. and introduction), Illuminations, London (Fontana Press) 1973, 238

[21] Woodward 1950: 108, as quoted in: US Signal Corps; 1957: 175, as quoted in: Friedrich Wilhelm Hagemeyer, Die Entstehung von Informationskonzepten in der Nachrichtentechnik. Eine Fallstudie zur Theoriebildung in der Technik in industrie- und Kriegsforschung, PhD thesis Berlin (Freie Universität, FB Philosophie u. Sozialwissenschaften) 19xx, 341

BIT-MAPPING

Physical and logical "space"

- "cyberspace" not cartographic but mathematic, thus *n*-dimensional; each 3-D-navigation on interfaces reduces the n-dimensional potentiality to spatial metaphors. Maps always took place on flat surfaces, depending on their material support for inscription; the crucial quality of digital calculation; mapping metaphor seductive but misleading when it comes to computing; trajectory of a ballistic missile not a function of space any more but of numerical tables; a missile corrects her trajectory "on the fly", by instant numerical feed-back

- 3D computer graphics at first glance corresponds with Panofsky's concept of Renaissance "systematic" space which exists prior to the objects. Indeed, the Cartesian coordinate system is hardwired into computer graphics software and often into the hardware itself. When a designer launches a modeling program, he is typically presented with an empty space defined by a perspectival grid, the space that will be gradually filled by the objects. If the built-in message of a music synthesizer is a sine wave, the built-in world of computer graphics is an empty Renaissance space, the coordinate system itself

- still based on referentiality, maps represent real or imagined territories; *Aspen Movie Map* developed by the MIT Architecture Machine Group headed by Nicholas Negroponte in 1978 still based on input taken by photographies of places in real Aspen, Colorado; the resulting interface thus is a metaphor (or rather simulation) of moving in real space. In Geoffrey Shaw´s interactive *Legible city* installation from 1989, urban architecture consists of letters; here, the Gutenberg Galaxy (McLuhan) returns from within the alphanumerical code, a re-entry on the user interface level. The spatial imperative is hardware architecture; alternative model has been developed by Knowbotic Research, for a Tokyo re-building quarter, ideas of "non-located online" - a cloudy challenge to the mapping paradigm

- against the theatrical paradigm of "computers as theatre" (Brenda Laurel), Manovich names "die Unterschiede zwischen dem isotropen Raum und dem der menschlichen Anthropologie" <89>

- "cyberspace" purely relational; Martin Dodge / Rob Kitchin in *mapping cyberspace* (London / New York: Routledge) 2001, 69 f.; essential for Cartesian grids: mnemotechnical images as technology of knowledge order and memory common in antiquity and the Renaissance are being replaced by numbers on the vertical and horizontal axis - un-iconic; "mapping" therefore taken in its mathematical, topological sense, in order not to confuse imaginary (iconic) with symbolic (indexical) operations in cybernetic aggregates and physical networks. Only computing can actually perform trajectories in *n*-dimensional calculation; really relevant maps have always been hidden, kept secret like the programs hidden behind cyber-spatial interface metaphors of "navigation"; new horizons for search operations in the Media Arts Net: Not just linking images and texts by alphabetical tagging, subjecting images and sound to words and external meta-data once more (the classification paradigm), but addressing

digital images down to the single pixel from within, in their own medium, allowing for random search (apparent disorder as alternative economy of information = the unexpected) - literally "bit-mapping", mapping (by) bits

- essential feature of networked computing = dynamic operativity; spatial order biased by "mapping time", that is: mapping temporal, processual operations

- very term territory serves as a referent fo any map; Latin term "imperium" originally did not mean an empire, a territory, but rather the extension, the reach of commanding powers, depending technically on the ways aand channels of communication, streets, postal systems; still neglects the time-critical von-Neumann-computer architecture, dissimulating its operative character in favor of images, maps

- Michel Foucault, "Other Spaces": 19th century dominated by concern with time; 20th century concerned with space. 21th century concerned with topologies: mathematics, coupled with the materiality of cabels, circuits, processors

- data visualization corresponds with the sublime: making visible the unvisible (Lev Manovich); the "mathematical sublime" (Immanuel Kant)

- installation *Polar* by Carsten Nicolai / Marko Peljhan for the Canon ARTLAB (Tokyo) in 1991, referring to the changing process of inivisible information = internet; idea from the novel *Solaris* by Stanislav Lem (1972): the "Ocean", a sea-like substance of an unknown planet Solaris reflecting human thoughts

- not just visualization of data or metaphorization. (Benôit) Mandelbrot Fractals not conceived on mathematical grounds; the insight into the correspondence between marco- and microscopic processes originated on the interface figurative level, on-screen; aesthetics as insight; Heinz-Otto Peitgen / Peter Richter, The Beauty of Fractals - Images of Complex Dynamical Systems; visual display of quantitative or quantifiably information a by-product of Cartesian modernity (Tufte)

Sorting / Searching

- search engines as agents of mapping (the generative knowledge machine); not subject sound / images (not even text, considered a stochastic character string) to logo-centristic meta-dating

- use is now being made of graphical searching devices on maps. <...> Churches may have the same symnol on maps, but they look different on the ground. The favoured approach here is to "teach" the computer to recognize a type of object <Davies 1990: 154>; instead of encyclopedic order: audio-visual search for linkage at random / by similarity, by digital association, connectivism; "iconoclastic" option; types of iconicity: image-like (iconic in its literal sense, graphical similarity); diagrammatic (structural homology, isomophic one-to-one mapping); semantic

- term "semantics" central for Humanities; in information science became a tool

to enable automated processing of information not "interpretable" by software agents, beyond the simple listing of controlled vocabulary like in Weizenbaum's ELIZA bot). "Ontology engineering aims at making explicit the knowledge contained within software applications" = ibid.; John Davies (ed.), Semantic Web Technologies. Trends and Research in Ontology-based Systems, Wiley 2006

- mapping = setting objects into relations; French physiocrat François Quesnay provided the first such map in 1758 *Tableau Économique*

- hashing (= distributes / gestreutes storage)

Bit-mapping

- image files contain basically a *bit map* = a long string of bytes, each of which describes an individual pixel of the image

- better: "infra-dating"; extracting data from within the image, the sound file; find all edges in a bit-mapped image

- navigation implies the sea: which defies cartography, no territory; rather random; navigation in the Internet / chronometer

- graph = lot of knots plus lines:

net with one centra; loop (each knot linked with two others); tree (hierarchical, thus vulnerable / encyclopedic hierarchy); mesh (each know linked with at least two, mostly more, or each with each linked)

- "According to Ted Nelson time is an important property of links. <...> Information concerning time stamp is a crucial for possible reposition of objects on a digital map and their integration with dynamically changing environment" = Jakub Klust, Linking Mind-maps and Digital Maps with Hypertext, Roskilde University Master Thesis (Autumn 2012) [URL: xxx], 67, referring to: Theodor Holm Nelson. Xanalogical structure, needed now more than ever: parallel documents, deep links to content, deep versioning, and deep re-use. ACM Comput. Surv., 31(4es), December 1999

- data traffic in WWW in discrete packets between server / router locations; no linear transfer, but time-discrete, micro-archival caching at various points; "being-to-death" (Heidegger): packets with stepped TTL (Time To Live) settings . To produce a map of data traffic, tracerouter tool sends out a series of packets with increasing TTL values = Wendy Chun, *Fiber Optics*; cyber"space" principally un-mappable cartographically for its dynamic existence

- "Hypoicons may be roughly divided according to the mode of Firstness of which they partake. Those which partake of simple qualities, or First Firstnesses, are images; those which represent the relations, mainly dyadic, or so regarded, of the parts of one thing by analogous relations in their own parts, are diagrams; those which represent the representative character of a representamen by representing a parallelism in something else, are

metaphors." ('Syllabus', CP 2.277, c. 1902) = The Commens Dictionary of Peirce´s Terms. Peirce's Terminology in His Own Words, eds. Mats Bergman & Sami Paavola, http://www.helsinki.fi/science/commens/dictionary.html

- elementary functions which are the condition of possibilities for the computer to start operating at atll (the BIOS for the Operating System) "are burned into silicon and thus form part of the hardware" <Kittler, There is no Software>, the autobooting mechanism

- electronic, digital media: mapping movement dynamically, "on the fly" = new quality; classical maps could neither be interactive not time-critical; feedback

- mapping = reduction of data complexity; neg-entropical (that is: a cultural technology); "transformation of matter from entropy to information, from a million sleeping transistors into differences between electronic potentials" = Kittler, "No Software"

- representations of the Internet as communication tool (logical nodes) and mapping of Internet showing physical nodes (cables etc.); Internet engineers focus more on logical connections than in questions of human communication; a map of such connections is n o t a spatial notion; difference between cultural technique of "mapping" which refers to maps / cartography; as opposed to techno-logical and mathematical use of the term: "mapping one content on another" (German *abbilden*)

THE INSISTENCE OF THE IMAGE ARCHIVE

New "anarchival" options in re-membering digital images

- flash animation on the website of Berlin conference in 2002 *Searching Images* ("Suchbilder"). By means of the wayback machine which takes regular snapshots of Internet web sites, this web site can be traced back at *archive.org*. The text and the image of the website are being kept, while the moving elements within escape the archivizing mechanism; www.suchbilder.de; progressive sorting of distributed pixels according to colour similarity; the algorithms of similarity-based image retrieval; W. E. / Stefan Heidenreich / Ute Holl, Editorial. Wege zu einem visuell adressierbaren Bildarchiv, in: Suchbilder. Visuelle Kultur zwischen Algorithmen und Archiven, ed. same authors, Berlin (Kulturverlag Kadmos) 2003, 9-15

- kind of "anarchival impulse"[22] engenders photography collections in terms of mathematical stochastics once images exist have been translated into the digital regime. In virtual memory space, new options of sorting images arise, different from categorical logocentrism and indexing by metadata, in fact: arrangements which arise from within the digital image itself ("imaged-based image retrieval); different from textual logocentrism and the regime of

[22] See the international workshop *The Anarchival Impulse in the Uses of the Image in Contemporary Art*, Museum of Contemporary Art, Barcelona, October 24th, 2012

metadata: image-based image retrieval (stochastic rather than categorical)

- progressive neg-entropic sorting of distributed pixels according to colour similarity; an anarchival or rather para-archival impulse can be identified in the algorithms of similarity-based image retrieval

- instanciation of dynamic image retrieval = IBM search enginge called "Query by Image content". QBIC = retrieval system for computer-based search for non-semantic aspects of a digital image (a mathematical operation), but can be supplemented by human help (tagging) for the semantic, iconological aspects[23]

- experimental algorithmics (see Active Archives project, Constant, Brussels) different from the well-organized institutional archive. Quantized (digitized) images can be transformed into a vast image bank which, once unified as data-set, can be subjected to image-based search operations such as matching of similarities, object feature detection, statistical colour value comparison etc. New kinds of search engines not only answer the needs of knowledge retrieval but develop into a creative art of revealing implicit data-"intelligence"

- media arts as avant-guarde in experimenting with new forms of access to image down to its single pixels. The strict basis for such experiments still is algorithmic knowledge; nothing "anarchic" in the digital *Forschungskunst*

- image-based search for images takes information itself as criterium in the order of images; loss of material authenticity in technomathematical reproduction in return leads to arriving at another level of abstraction; its mathematical intelligence is based on technically standardised, unified alphabets; nothing really anarchic in the digital world, since the alphanumeric regime is always symbolic order

Sorting photography: between image-based sorting of photography and logocentrism (George Legrady)

- Heinrich Wölfflin's *Kunstgeschichtliche Grundbegriffe* (1915) aimed at formal criteria for sorting art historical images according to criteria like "open" vs. "closed" form; today, this vision can be realized by automatic image-based image grouping. Such a clustering sucessively liberates image configurations from word-based *tagging*. Even commercial digital images sorting software for private photographies sometimes offers the display of histograms (diagrams displaying the statistical distribution of colour in images); this is a perfect training in image-immanent navigation of the visual archive.

- tagging and meta-dating of images a supplementary, belated symbolical operation applied to images. Automated sorting of images to a large degree still depends on such annotation: "Computers can help us. But only after we help them first by feeding images descriptions."[24] Since once an image has

[23] See Myron Flickner et al., Query by Image and Video Content. The QBIC System, in: Mark T. Maybury (eds.), Intelligent multimedia information retrieval, Menlo Park, CA (American Association for Artificial Intelligence) 1997, 7-21
[24] Lev Manovich, "Metadating" the Image, in: same et al. (eds), Making Art of

been turned from a physical carrier into information by the act of digital scanning, is transforms into a mathematical representation devoid of semantics. The computer has to be trained in order to gain icono-logical knowledge; to teach the computer human "thinking" has been the dead end of Artificial Intelligence. But let us turn this argument upside down. The apparent computational lack, the "semantic gap" which separates the Turing machine from human understanding, can be interpreted as its virtue, since it opens an aesthetics of parametrical sorting and archiving - opening unforeseen spaces of visuality.[25]

- in optical scanning, computer does not recognize an "image" in its cultural (thus human) sense, but rather its elementary parameters: statistical colour distribution, edges, lines, shapes et cetera. Stochastic rather then library-oriented, classification-based sorting of images thus becomes feasable. At the same time, digitization of images results in an ultimate addressability of each single picture element, the so-called pixel. Adressability is a central characteristic of the archival operation[26]; thus we can say that by digitization the image becomes essentially archival.

- cinematographic movies which - as we know - consist of sequences of discrete photographic frames - can thus be transformed into a vast searchable data-set.

- correctness of computer memory is its essential lack when compared to human remembrance operations[27] which rather distort memories; according to the inventor of the graphical user interface in computing, Licklider (1960), the human is a "fuzzy, noisy device", but in turn gifted with the capability of parallel signal and data processing. From that results a different attitude towards image collections:

- fuzzy computer-sorting makes comparisons of similar (but not identical) images on the basis of new protocols; alternative to "alphanumeric labelling and keywording of pictures <...> aided by re-born analogue machines"[28]; closing the "semantic gap" between the anarchivic element within humans and computing; not training computers to behave counter-logically

- operation of the brain "physically quite analogous to optical processing" itself = P. J. van Heerden, The foundation of empirical knowledge, Wassenaar 1968,

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Databases, Rotterdam 2003, 3

[25] Gottfried Boehm, Jenseits der Sprache? Anmerkung zur Logik der Bilder, in: Hubert Burda / Christa Maar (eds.), Iconic Turn. Die neue Macht der Bilder, Cologne 2000, 45

[26] See Claus Pias, Maschinen/lesbar. Darstellung und Deutung mit Computern, in: Matthias Bruhn (ed.), Darstellung und Deutung. Abbilder der Kunstgeschichte, Weimar 2000, 129

[27] See Draaisma 1995: 166

[28]Duncan Davies, Diana Bathurst u. Robin Bathurst, The Telling Image. The Changing Balance between Pictures and Words in a Technological Age, Oxford (Clandendon) 1990, 64 f.

- *Pockets Full of Memories*, an online and museum installation by George Legrady in which the audience *creates* a collection by contributing a digitally scanned image of an objekt in their possession during the visit

- http://www.pockektsfullofmemories.net; http://www.medienkunstnetz.de/werke/pockets-full-of-memory

- dynamic sorting engine of Legrady's installation based on a self-organizing map, the Kohonen algorithm[29]; SOM "captures some of the fundamental processing principles of the brain, especially of the experimentally found ordered maps in the cortex"[30]

- In terms of informational communication theory the *self-organizing map* is "an adaptive semantic memory model <...>. It is dynamic, associative and consists <...> adaptive prototypes."

- "Memory is transitory."[31] Bush in 1945 formulated his design of a Memory Extender (MEMEX), a memory machine which is not oriented at the artificial taxonomy of libraries but at the human brain functions which operates less logically but associative

- self-Organizing Map translates the key-words (semantic information) and object description and turns them into numbers; this is how the mathematically determined organization happens. "Many of the other metadata also influence the location, for instance, the date, possibly the object's origins" = e-mail Legrady, July 29, 2010

- Legrady's installation has been a mixture of both human (semantic tagging) and inhuman (algorithmic) sorting of images. In his more recent, technologically up-dated version called *Cell Tango*, Legrady (together with Angus Forbes) displays a projection of constantly changing cellphone photos. The phots are first sent by individuals (to pix@celltango.org), and then projected rhythmically over a large, black screen in a variety of patterns. Fresh snapshops swiftly adjust to that mosaic according for formal criteria (image-based matching) and according to their tags (meta-data), mingling with photos taken from Flickr, the photo-sharing web portal. In one of the four modalities of the installation, "Cell_Bin", the most recent images are placed on the black

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[29] See Andreas Teckentrup, Einsatzmöglichkeiten selbstorganisierender neuronaler Netze in der Wirkstofforschung, Diss. Essen 2000; *online* http://www2.chemie.uni-erlangen.de/services/dissonline/data/dissertation/Andreas_Teckentrup/html/teckentrup00.html (accessed August 20, 2012)

[30] Timo Honkela and Juha Winter, Simulating Language Learning in Community of Agents Using Self-Organizing Maps, Helsinki University of Technology, Publications in Computer and Information Science, Report A71, December 15, 2003

[31] Vannevar Bush, As We May Think [*1945], online http://www.isg.sfz.ca/~ duchier/misc/vbush/vbush-all.shtml, 6

screen first, and an algorithms randomly distributes them. The space left inbetween is successively filled by smaller incoming photographies. This loosely coupled patterns evolve dynamically. In this form of media art, algorithmic information is the artist's main medium.[32]

Sorting images: *Pockets full of Memories* (Legrady)

- in George Legrady's installation *Pockets full of Memories* at the Paris Centre Pompidou in 2001, visitors invited to first scan personal items and then ascribing values to then by means of a computer touchscreen with a pre-set questionnaire. The resulting values as database then led to the algorithmic placing of scanned objects on the large two-dimensional map.[33] On this visible surface, the "imaginary museum" therefore did not place incoming objects in a pre-existing spatial order but was in constant motion. The real archive, though, hides within the order of the Kohonen self-organizing map algorithm. Against the metaphorical map visible as interface, a different map (as archival diagram) is at work here. What might look like randomness in the dynamic re-placement of visible objects therefore "is not without structure"[34]

- "Rijksstudio" Amsterdam: user becomes "curator" of the images dta bank of Rijksmuseum

- in trading economy, concept of „chaotic storage“: "Die Waren werden nicht mehr nach Warengruppen sortiert, sondern wandern dahin, wo gerade ein Lagerplatz frei ist. Sie sind also unsortiert oder folgen dynamischen Suchkriterien wie der Zugriffszeit. Das entspricht dem Vorbild eines RAM-Speichers <...>: fest Speicheradresse, variabler Speicherinhalt. Die traditionellen Lager waren Festwertspeicher."[35]

Today, the books of the National Library of Norway are stored that way and accessed by a speedy robot in a three-dimensional Cartesian grid of book-boxes in shelves.

- alternative forms of database that create interesting relations between digital archival records: ImageSorter (genuinely sound- and image-based: color gradient similarities of images)

- sound and images traditionally tagged by textual metadata (the archival

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[32] An argument of George Fifield (Boston Cyberarts Inc.), "Can you see me now?", in: The Boston Globe; online: http://www.wellesley.edu/DavisMuseum/exhibitions/exhibitions_celltango.html; accessed August 2010

[33] See Sven Spieker, On the Question of Archives and Entropy in Contemporary Art (Legrady, Muntadas), in: Krzysztof Pijarski (ed.), The Archive as Project. The Poetics and Politics of the (photo) Archive, Warschau 2011, 114-126

[34] Spieker 2011: 117

[35] Bernhard Vief, Digitales Geld, in: Florian Rötzer (ed.), Digitaler Schein. Ästhetik der elektronischen Medien, Frankfurt7M. (Suhrkamp) 1991, 117-146 (143, note 11)

inventory); organization of the archive as a database. This belongs to the symbolic order of what is properly called the archive. An alternative is the approach which does not produce metadata for the ordering of such records but sorts them from within which is the signal-based approach. Once can either tag an image by, e. g., the painter's name, or one can treat the same image as complex signal which allows for sorting it according to entropy, colour values or shape detection within; HA Wannhoff

The metadata approach belongs to the familiar archival symbolic regime, whereas the signal approach is truly oriented at the materiality of sound and images. Of course this all becomes more complicated when images are not recorded, e. g., as analog photography or electronic video signals but digitally sampled. This results in a symbolic regime in an even more fundamental sense and re-introduces the archival order. But this fundamental archive of digital sound and images is strictly techno-mathematical and numerical, not metadata in the traditional sense which subjected sound and images to logocentristic key-terms expressed alphabetically.

- self-organizing map (SOM) as core concept of the Kohonen algorithm a mode for similatity-based "signal" approach. George Legrady, in his installation Pockets full of Memories (extended to social web by his up-dated version Cell Tango) combined both approaches: The algorithmic sorting of objects in the media-archaeological way (as self-organizing map) on the one hand, and the subjective, personal tagging of objects by the individual participants (the human approach, focused on emotional semantics)

Temporalizing the archive: From space-based to time-based archives

- photographies "on the line", most literally = the cinematographic stripe and reel of celluloid; Aby Warburg's *Mnemosyne* panels functioning "like screens on which the phenomena produced in succession by the cinema are reproduced simultaneously" = Michaud (2004), S. 262; see Philippe-Alain Michaud, Aby Warburg et l’image en mouvement, Paris 1998; basic unit of his picture tables was still the photographic frame. With digital sampling of images, all of the sudden photograph can be literally addressed down to the single pixel.

- digitizing photo-chemical images = transformation of the material storage into electromagnetic ephemerality and latency. The gain of flexibily and computability, is paid for with a dramatic loss of durability.

- digital photography is no material light inscription any more, but its numerical information - as becomes evident when the "core dump" mode is chosen for its representation on display

- in trans-photographical data spaces the message of the medium is the alpha-numerical code; profound mathematization (instead of iconization)

Flexible access to the chrono-archive

- epistmeological notion of "archive" as expressed by Foucault: Which rules govern what kind of photographic memory can be expressed and remembered (that is: stored) at all? It is not only human archivists any more, but in a higher degree than ever it is technologies upon which the readability of such documents depends. The archival record has become techno-mathematical sublime in electromagnetic latency - being there, but not accessible to human senses any more.

- dynamic access needs = flexible tool which allows for the coexistence of different orders without destroying the existing database structure

- digital storage of large amounts of photographic objects results in new types of transmission, compression and retrieval which are based on differentiation like the send-on-Delta sampling which only registers decisive alterations to sequences of similar images. Dynamic access now replaces the static classification of the traditional logo-centristic catalogue, just like statistical probabilities have replaced particular knowledge in information theory, and pattern recognition replaces individual identification

- chrono-photography performed the time-discreete recording of life itself - but the essence of technical cinematography hidden to human perception

DE-HISTORICIZING ART HISTORY

Experiments with the art historical archive: Histogrammatology

- *Active Archive* project of artistic research group Constant applies algorithmic processing of digital scans of the huge photographic archive of the Norwegean avantgarde author Ansgar Jorn; in 1965 Asger closed down his Scandinavian Institute of Comparative Vandalism (SISV), reborn algorithmically: http://sissv.activearchives.org/w/Histograms_in_the_distance; see http://sissv.activearchives.org/w/Quick_guide_to_the_experiments

- "These digital images are made of pixels rich in color informations, but how can one 'order' by color? What is a significant color information? Contrarily to human intuition, for a computer, a white image is an image saturated with red, blue and green. <...> Ordering is then not only following the raw values coming from the digital objects but already transforming them in dialog with a certain understanding of human perception."[36]

- Is there a non-ocular aesthetic essence of images which can only be *arti*culated by computational (informational) aesthetics? Looking at images the way a scanner does; experimentation with histograms for exploring the digital photo-archive

- Bill Viola's video installation with 20 minutes of just visual noise. But this highly improbable flimmering of electrons on the screen, according to the

[36] http://guttormsgaard.activearchives.org, "eleven orderings: guttorm guttormsgaard"

mathematical theory of communication as developed by Claude Shannon in 1948 as the basis of all our today media communication systems, contains the highest degree of possible surprise; that is why Viola calls his piece *Information*

- Latin *scandere* 'to scan verse'; technical scanner a technological "device trying to mark off verses in digital images, fueling its algorithms with matrices of pixels rather than the metric feet"[37]

- Bill Viola's definition of the electronic video image as "The Sound of One-line-scanning"[38]; a specific temp*aura*lity; Benjamin defines the *aura* as peculiar interlacing of time and space: "Ein sonderbares Gespinst von Raum und Zeit: einmalige Erscheinung einer Ferne, so nahe sie sein mag"[39]

- Photography, literally understood (Herschel / Roland Barthes, *La chambre claire*) as a photonic emanation of an object) "memorizes" rays of light to the viewer in the present - a delayed transfer of what otherwise would have vanished into the dark. This inscribes physical tempor(e)ality into the image. In addition, chrono-photography then performed the temporal archivization of life itself - but the archival essence of technical cinematography is mostly hidden to human perception

Visual im/mediacy: Sorting images

At the intersection between analogue image archives, digital image search machines and academic image theories a rupture of visual culture (technology) takes place. It is now possible to navigate through large amounts of images beyond verbal tagging - by im-mediate access to images, unfiltered by words: *searching images* in the active sense.

- Descartes killed the *ars memoriae* by subjecting the image to the numerical code (Frances Yates, Art of Memory). "Digitzation" took place with analytic geometry already

- physical world items, once sampled into digital information units (bits), can be *telegraphised* - the Nipkow disc television image paradigm; applied to genome sequence and the body: Norbert Wiener, God & Golem, Inc.: A Comment on Cetain Points Where Cybernetics Impinges on Religion [1986], Cambridge, MA (MIT Press) 1986, 36

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[37] http://sissv.activearchives.org/w/To_scan_and_skim, accessed 11th December 2014

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

[39] In: Walter Benjamin, Kleine Geschichte der Photographie, in: ders., Gesammelte Schriften, edited by Rolf Tiedemann / Hermann Schweppenhäuser, Frankfurt/M. (Suhrkamp) 2nd ed. 1989, 368-385 (378)

- In digital culture the essence of the image itself dissolves into alphanumerical data - the ultimate victory of the archaeological alphabet (which, in early Greece, has been used for verbal, geometrical *and* mathematical operations equally.

Vilém Flusser's definition of the technical image: "Technobilder beruhen auf Texten, sie sind post-historisch."[40]

- this is not an "end" to art history in the linear sense (this would still re-affirm the historical narrative), but a structural *end* as fulfillment in the media-archaeological sense

- it is the computer which "deciphers" images as data-sets. When visual content of museums - once it has been digitized like in Picture Disk editions of art historical works - becomes alpha-numerically addressable, new options of mobilizing the inherent information by intelligent algorithms is possible.

- addressing and sorting audio-visual media content by non-scriptural means; with the arrival of fast-processing computers, this option be met by digitizing analogue source material. The result is not necessarily better sound or image quality but, rather, the unforeseen ability to address not just sound recordings by chunks and images by frames, but every single acoustic or picture element. Images and sounds thus become calculable and capable of being subjected to pattern-recognition algorithms. Such procedures will not only media-archaeologically excavate but as well generate unexpected optical statements and perspectives from the audio-visual archive that can, for the first time, organize itself not just according to meta-data but according to its proper criteria - media memory from within its own logic (endogenic). Only what is being algorithmically „excavated“ by the computer (such as the media archaeology of analog sound recordings which had become inaccessible) is a genuine technological retro-action

- the digitalization of image archives actually liberates the photographic memory from being subjected to external, metadata-based alphabetic search operations at all, opening the possibility for image query by images themselves (similarity-based image retrieval)

- light and sound frequencies belong to the regime of the real; according to Jacques Lacan, the real always returns to its place. This quality is transformed by the mathematization of the analog signal into the symbolical (algorithmic) regime

- storage of picture content in computer memory rather adopts the "St. Petersburg hanging" according to spatial economy of formats rather than according to subjects or as historical unfolding in period rooms.

- ahistorically, the non-iconological and non-historicist "Petersburg hanging" of

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[40] Flusser Archiv, University of the Arts, Berlin, typescript "Von der Zeile ins Bild (zurueck)", 3. See Vilém Flusser, Into the Universe of Technical images [1985], Minneapolis (Univ. of Minnesota Press) 2011

pictures according to their formats returns with algorithmic sorting of digital images; cultivate the informative dis-ordering of art history; SOM Legrady, *Pockets full of Memories*

DIGITAL ADDRESSABILITY

"Social" archives in Web 2.0?

- with(in) the World Wide Web, emphasis shifts from the storage imperative (in occidental culture) towards on-going transmission and circulation

- photography portal Flickr rather a repository than an archive (in proper terms).[41] "The digital archive is by nature a database."[42] So-called *social media* platforms like Facebook, Youtube or Wikipedia represent rather searchable data banks than archives in its proper sense. Flickr rather a random collection than a well-structured archive, since it is user-generated, a generative archive. Its order depends on the accidental meta-dating (tagging) by the content-providers, not on any archival logic. Its archival logistics is rather the underlying algorithmic structure of image database management. Archives of photographic images themselves get in motion[43]

- most image contents can still not be algorithmically searched and accessed. The uncalculable is the real challenge to the "digital archive". Most photographic collections in the Web are rather libraries and not itself an archive. Rick Prelinger defines the Internet Archive in San Francisco itself as a "nonprofit digital library"; preservation is neither its mission nor its practice.[44] It is open access which distinguishes such a library (or *musée imaginaire*) from the archive which tends to keep secrecy by definition - like the *protected mode* within microprocessors.[45]

From semiotic analysis to "cultural analytics" of the moving image

- In so-called digital humanities, the archaeologists of knowledge are not exclusively human scholars any more but algorithmic media as well; connected with a subtle shift from cultural (mostly semiotic) analysis of photography to

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41 For a discussion of this point of view see Frank Kessler / Mirko Tobias Schaefer, Navigating YouTube: Constituting a Hybrid Information Management System, in: Snickars / Vonderau (eds.) 2009: 275-291 (277)

42 Pelle Snickars, The Archival Cloud, in: ders. / Vonderau (eds.) 2009: 292-313 (304)

43 See Ekekhard Knörer, Trainingseffekte. Arbeiten mit YouTube und UbuWeb, in: Zeitschrift für Medienwissenschaft vol. 5, no. 2 / 2011, 163-166

44 Rick Prelinger, The Appearance of Archives, in: Pelle Snickars / Patrick Vonderau (eds.), The YouTube Rader, Stockholm (National Library of Sweden) 2009, 268–274 (268)

45 See Thomas Little, Das PC-Buch: die Hardware und ihre Programmierung, Munich (System Verlag) 1990, 97-107; further Friedrich Kittler, Protected Mode, in: Manfred Faßler / Wulf Halbach (eds.), Inszenierungen von Information. Motive elektronischer Ordnung, Gießen 1992, 82-92

"Cultural Analytics" (in terms of Lev Manovich), that is: computer-based matching

- Matthias Wannhoff, "Finden, was wir nicht suchen können." Ein Versuch in algorithmischer Spielfilmanalyse mittels Cultural Analytics (summer 2012), http://www.medientheorien.hu-berlin.de, section "Hausarbeiten online": statistical (rather than semantic) analysis of huge amounts of grabbed single photographies (of which one special form is films as dissected into single frames) with digital image processing such as pattern analysis and subsequent two-dimensional re-visualisation of such algorithmically calculated data by computer graphics. A new kind of iconology arises, based on logical operations rather than content analysis; method Axel Roch, video *Visualisierung von Texten durch Bilder*

- dominant criteria for the sorting of digital or digitzed (sampled) photographies come from within their media essentiality, that is: digital pixel values such as color: "Hue describes the color type, or tone, of the color (and very often is expressed by the „color name“), saturation provides a measure of its purity (or how much it has been diluted in white), and lightness refers to the intensity of light reflected from objects" = Oge Marques, Practical Image and Video Processing Using MATLAB, Hoboken (Wiley) 2011, 398

- describe images with images; Lev Manovich, How to Compare One Million Images?, in: Understanding Digital Humanities, edited by David M. Berry, Basingstoke (Palgrave Macmillan) 2012, 249-278 (263)

- Software Studies Initiative at the University of California in San Diego developed a couple of tools, available online; terms derived from statistical mechanics and physical thermodynamics enter which have been adopted for the mathematical theory of information by Claude Shannon et al.: "Hohe Entropie entspricht einer ‚zufälligen' (= wahrscheinlichen), niedrige Entropie einer hoch organisierten (= unwahrscheinlichen) Anordnung"

[notes on paper Matthias Wannhoff, presented 1st November 2013, University Library, Amsterdam]

- Cinematics = Software for *Schnittanalyse*; not film frames as basic unit of analysis; *editing* based on gaps between the images

- line diagram can be transformed in ImagePlot; allows for direct addressing of single frames; cp. Roch, "Texte als Bilder als Signale"

- ImagePlot is diagrammatic in Peirce's sense: activated in moment of observation which brings temporality in image analysis

- Pixel-by-pixel analysis re-chronophotographises film

- How “self-evident” are the graphs produced by the image processing software ImageJ? How does this “reading” of a graph relate to approaches aready established in “non-digital” humanities (hermeneutics, ekphrasis, semiotics)?

- *Mapping time in the moving image*; average shot length still regarded

dominant parameter in quantifying moving images, see approach developed by film scholar Yuri Tsivian, CineMetrics; data desired by this approach can hardly be gathered automatically by a computer but inevitably requires manual annotation; theoretical deficiency. "Does a frame-per-frame approach to visual data (as doable and automatable through Cultural Analytics) not take the material much more seriously than the abstract counting of spaces (= cuts) between images?"

Dis/order in photographic archives

- with intelligent analytics (algorithms), the photographic (ex-)archive, once sampled into computational numerics, becomes poietical itself, generating new patterns of making use of stored visual evidence

- a reverse proportional memory economy at work with photographic archives. Physical storage of the photographic print provides, when being taken care of by professional conservation, a relatively stabile enduring memory, but more difficult to access. Once being digitized, the electronic image is open to almost real time access and new search options like similarity-based image retrieval; at the same time, the "virtual" essence of the electronic image becomes more fragile and subject to alteration than ever

- traditional architecture (*Tektonik*) of the archive based on classificating records by inventories; in the digital media rather sorting records in fluctuation, that is: dynamic order; this is an "archive" no more, but algorithmically ruled processuality. In such a new order, images can not only be retrieved as contained in their frames, but even by their atomic elements, pixelwise. Thus even what has not been meta-dated at all by human indexing can be automatically retrieved, opening new options of visual memory (be it in photography, be it in film).[46] Such a distribution of image elements does not belong to the library or the traditional archive any more, but builds up a new, mathematized generative principle, thus: an archive in the Foucauldean and Shannonean sense, being based on information itself. This new panopticism is being applied by commercial and military agencies already. New software like Microsoft's *Photo DNA* which allows for the automated idenficiation of - for example - child pornography on websites already indicates by its name that the basis of biological and technomathematical life forms start to converge

- instead of thinking the archive in terms of symbolic order by classification, we have to think entropically, that is: allowing for a certain amount of signal disorder, which contains, according to communication theory, a higher measure of (possible) information

- rather stochastic "excavation" of knowledge; traditional archaeological "cluster analysis" of burial grounds

The acceleration (temporalization) of the archive

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[46] Harun Farocki, Arbeiter verlassen die Fabrik, in: Meteor – Texte zum Laufbild, No. 1 (December 1995), 49-55 (50)

- digital art challenges "the conditions of archiving in our current regime of telecommunications"[47]; photography from the beginning has not just been about permanent fixation of images but as well about immediate transmission; Alexander Bain already in 1844 invented a system for image telegraphy. With photography, the image not only became durable but as well in an antithetical way evanescent - a tendency enhanced by the very nature of the electronic image (*fluxus* in every sense), and in the age of digital media the image becomes coded information in a channel.

- an electronic switch-principle for visual memory for explaining image generation in the brain (esp. in the cortex region): "Auto-associative networks, now under theoretical study by computer scientists, have properties that are comparable with visual memories. You have to imagine a matrix of parallel-switched neurons whose synoptic links react on themselves in loops with the aim of being able to store a great deal of content at the same time <...>" = Schulz ibid., 27

- unlike traditional encyclopedias, *online* encyclopedia Wikipedia updated in its knowledge almost by the minute. The radical temporalization of knowledge space transforms the "archive" dramatically, with the new "Web 3" economy being the realtime net

- whole Google architecture is reminiscent of an archive. But this is not the classical archive any more, but a processual one, with the Page Rank algorithm re-generating the ranking of retrieved information according to statistical and referential (URL links) values and weighting (the genotypical level). It is still a rule governed, programmed system which organizes information so that it may be retrieved, but different to the traditional archive this archival "inventory" is updated - and indeed reconfigured - at an incredible speed: always another archive (on the phenotypical side)

- "Typically the dynamic dimension of the web is largely beyond the scope of search engines. They survey static web pages, relegating real time dynamics to the so called deep web (Halavais 2009, 16). Thus archives still exist, helping you find your way around the anarchive of the net" = Jakobsen 2010: xxx

New memory options of image retrieval

- Aby Warburg's noteworthy *Mnemosyne Atlas*; method of tracing the tentatively "unconscious" cultural memory of visual gestures (derived from antiquity and re-activated in the Italian Renaissance) performed on a technical recording medium basis, which is: black & white photographies of works of art which could be associatively arranged and re-configured on a black board at Warburg's Kulturwissenschaftliches Institut in Hamburg.

Whereas the scholarly publication of Warburg's *Mnemosyne Atlas* inevitable

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[47] Charlie Gere, New Media Art and the Gallery in the Digital Age; http://www.tate.org.uk/research/tateresearch/tatepapers/04autumn/gere.htm (Herbst 2004)

freezes such dynamic reconfigurations in momentary snapshots, its digital publication allows for combinatorial access to the single elements of such visual tables; van Huisstede 1995: 158: "Wenn es jemals ein Projekt gegeben hat, das in einem elektronischen Medium wie der CD-ROM angemessen zu präsentierten wäre, dann ist es der Mnemosyne-Atlas"

- human and / or cultural memory does not access images like a visual search machine. It is inevitably rooted in iconological and semantic vectors which in their culturally contextual fuzziness can not be performed by a machine which can only operate with exact data. Even similarity-based retrieval algorithms like the Kohonen Self-Organizing Map (Legrady) would necessarily miss the cultural order of images. Is this quality of Turing machines a defciency to be eliminated by "cognitive" or "neuronal" computing or rather an alternative to be cultivated to enrich the notion of cultural memory by non-human points of view?

- "sorting pixels by colours", a dynamical Flash-animation in operative framing of the former conference *Suchbilder* www.suchbilder.de

Visual im/mediacy: Towards a dynamic technology of photographic (and moving) image retrieval

- possible, in the age of high-performance computing, to navigate through large amounts of moving images beyond verbal language; there is something like an im-mediate access to archived dance, unfiltered by words or metadata. Expressing digital pictures by numbers undermines the old dichotomy between image and meta-data; there is rather an implosion of images and numbers in digital time

- most extraction in analogue photo archives by grip on the single print, the storage medium only, not accessing its smallest elements

- can a digital image still be called a photographic image? What is a photography: a set of data, a format, an „epistemic thing“ (Jörg Rheinberger)? And at what moment does it become an image? By human perception only, or independent from human awareness already within its medium? Without human interpretation of certain visual patterns, the image would just be a cluster of data. Optical signals become information „in the eye of the beholder“ only. The computer can deal with the symbolical analysis of physical data only, not with the imaginary.

- Foucault's archaeological and archivological analyses autopoietically refer to the alphabet-based world of textual libraries. But "discourse analysis cannot be applied to sound archives or towers of film rolls."[48] What digital space allows for instead is the option of navigating images in their own medium - without changing from visual to verbal language at all. Different from printed letters in a book, the symbols in digital technoscapes are arranged and distributed algorithmically.

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[48] Friedrich Kittler, Gramophone - Film - Typrewriter, Palo Alto, Cal. (Stanford UP) 1999, 5

- humans irresistably interface to photographic images in an iconologic way; search for visual knowledge instead uncovered from within the visual endo-data: entering the image itself (data-immersion), which is the media-archaeological gaze that can be performed by machines of image processing bettern than by human perception. Such *informatized* organization of visual knowledge generates diagrams (which is as well the Deleuzean intepretation of the Foucaultdean *archive*) - infomapping. Our visual culture is still dominated by semiotically iconic, photographic-like images; the twenty first century though allows for genuinely computer-generated visual information, closer to diagrams than to "images", which will eventually take their place and enable unprecedented types of "visual" representations

- computer-based retrieval can find all edges in a bit-mapped image. Such a „digital image“ is an image no more; what looks like images, is rather a mathematical function of data distributions

ARCHIVE, STORAGE, ENTROPY. TEMPOR(E)ALITIES OF PHOTOGRAPHY

Inbetween storage, memory and archive

- storage is the gesture of setting apart from immediate (con-temporary) consumption of matter, energy or information for later re-use; progressive digitalization of records and online-accessability

- temporalization, that is: acceleration of access and mutability of online image collections might be counterbalanced by archival restistance against against *streaming data* on the material and structural level. But the archival record can not restist against time, even if in storage it seems time-susended

- photography refers to tempor(e)alities on various levels, ranging from the inherent entropy of the photo print up to the *punctum* as phenomenological affect

- Corbis Corporation's image "archive" located in the Iron Mountain, Pennsylvania[49]; keeps the physical photographies and negatives of which it commercializes their digital distribution and rights. In the cold technical language of computing *memory* nothing but a metaphor for a kind of storage which is not about remembrance but simply a function of addresses, of loading and intermediary storage, since the original photograph can only accessed digitally any more. Albert Kahn (in the case of his *Archives des la Planète*) "[...] probably did not foresee that the material recorded with the new media of his time – autochromes and films – would become accessible in another medium only. Since most of the shots in the archive only exist in one screening print due to their lack of exhibition, and since the autochromes could only be reproduced through re-photographing, the material has been almost entirely inaccessible until today. The archival imperative of digitization has made the documents accessible only as a world in bits. The FAKIR database, available on the

[49] See See Jorinde Seijdel, Cold Storage, in: Open 2004, Heft 7 "(No)Memory", 66-77

premises of the Albert Kahn Museum, and its small web version Mappemonde <...>."[50] But in less user-interface oriented perspective, the digitized images allow to nagivate their informational content from within, by intelligent algorithms in terms of Digital Humanities research. The power of cultural memory now takes place technologically. Opening new options of dynamical (re-)search, the algo-rhythmicized photo-archive becomes "poetic" in the sense of knowledge-generation itself. Disorder is not just a threat to photographic archives but a chance for a different aesthetics of memory. Once photographies from the past have been digitized, creative new ways of sorting and retrieving images are possible, with algorithm-based criteria such as similarity, pattern recognition, object extraction, shape distribution. Not just being subjected to logocentristic metadata, true content-based image retrieval makes use of the photo-data *from within*, endo-informationally

Archives as non-narrative alternative to historiography

- tradition of early 20th century avant-garde which "questioned all models of memory (especially narrative ones), favouring openly dynamic, discontinuous forms contiguous with the modern means of technological reproduction <...>, especially photography and film”[5]

- algorithmic logistics of image orders undercuts the iconologic narrative by discrete counting (alphanumeric metadata). Here, the tight coupling of symbolical evidence ("history") is being replaced by a loose ("mediatic" in terms of Fritz Heider) archival coupling:

"Although individual sequences of pictures were often organized according to a narrative logic, one sees clearly that the overall structure was informed not by a narrative paradigma, but by the paradigm of the archive. After all, the sequence could be rearranged; its temporality was indeterminate, its narrative relatively weak. The pleasures of this discourse were grounded not in narrative necessarily, but in archival play" = Sekula 1985: 58

Latency as resistance against *streaming data*

- traditional archive = both spatial and temporal separatedness (set apart) from the actual present, a kind of con-temporary latency. Such a deferred / delayed present

- transitional records; the chemical nature of photography (the temporal gap between expusure and development); "negative" first: latency provides a temporal shelter (Hegelian *Enthobenheit*) against immediate consumation, a chronotemporal an-economy (de-coupled) and a guarantee against permanent transformation: keeping the *monument* (in Foucault's sense)

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[50] Trond Lundemo, Mapping the World: Les Archives de la Planète and the Mobilization of Memory, in: Ina Blom, Trond Lundemo, and Eivind Røssaak (eds.), Memory in Motion. Archives, Technology, and the Social, Amsterdam (AUP) 2017, 213-236 (226)

- better speak of libraries of photography, of "Phototheque"? The archival keeps unique, singular records - like Daguerreotypes. The library keeps multiple, mass-reproduced printed documents - like Talbotype.

- with digitalization of analogue photographic prints or negatives, the original does not become redundant but is the only way to unhold authentification evidence. Once turned into numerical information, the (former) photographic image looses its touch with irriversible physical inscription, the temporal mark

- undoing historicity, there is media-material transcendence in photography. In medieval Europe, light in cathedrals meant to transcend the material boundaries of architecture. With photographic emanations, light itself becomes a "historiograpical" index (or even media-phenomenologically transcends history by its affect of immediacy on the human temporal sense: preserving the past as present). But still this is not immaterial but bound to a chemical storage medium. *Temporal* transcendence of materiality is a faculty of operative media technologies

The multiple embodiments of the archive

- new kind of archive which emerged within the Internet: its protocols (Galloway); old archive becomes a mere simulacrum ("content") in the digital world and dissolved into dynamic re-ordering; a new "permanent" (or at least stable) *archive* of rules has emerged

- on symbolic level of digitized record management a permanent re-ordering possible in *n*-dimensional space, without changing the conservational actual order to the material records

- parallel to rigid meta-dating (the archival thesaurus and classification), an ever transforming set of adressing records is possible once records exist in digital, that is: mathematicized space: not fixed meta-data there, but permanent metamorphosis

Photography in the archive: between the indexical and the representational

- photography interpreted as an archive itself: "Bertillon sought to embed the photograph in the archive. Galton sought to embed the archive in the photograph"[51]

- between "temporalities" and "tempo-realities". The temporalities of archives refer to the inherent temporal essence (the *Eigenzeit*) of archives as memory institution and storage media, wherease the tempo-realities refer to the function of the archive both *in* historical time and *as* condition (Kantean *a priori*) of historiography

[51] Allan Sekula, The Body and the Archive, in: October 39 (1986), 3-64 (55)

- three conflicting time regimes ("tempor(e)alities") in the archive: on the one hand, it is meant to suspend time to transfer information for future memory (negentropic time); on the other hand, it is subject to time at work (entropic processes, material decay); thirdly, the speed of access, migration, short-time memorial functions of the archive increases. Is photography an archival medium at all? Is photography collective or archival by its very nature?

- Henry Fox Talbot in *The Pencil of Nature* explaining plate III (a photography of „Articles of China“): "The whole cabinet of a Virtuoso and collector of old China might be depicted on paper in little more time than it would take him to make a written inventory describing it in the usual way. The more strange and fantastic the forms of his old teapots, the more advantage in having their pictures given instead of their descriptions."

- photography subjected to the bibliographic rather than the archival order. The open policy of collection (library, museum, data bank) is confused with the strict rule-governed system of the archive, even Alan Sekula in his archivology of photography: "Roughly between 1880 and 1910, the archive became the dominant institutional basis for photographic meaning" <Sekula 1986: 56?>. The bibliographic paradigm ruling photograpic memory organization soon became clear. What looks like the "archive" in a metaphorical sense, turns out to be the order of the library:

"At a variety of separate but related congresses on the internationalization and standardization of photographic and bibliographic methods, held between 1895 and 1910, it was recommended that photographs be catalogued topically according to the decimal system invented by the American librarian Melvil Dewey in 1876. The lingering prestige of optical empiricism was sufficiently strong" = Sekula 1986: 56?

- different from the phonograph which is a storage medium as well, photography does not depend on an operative apparatus to articulate its content but can be processed by human perception immediately (without interference of a technical medium of re-generating the registered signals)

- since end of 19th century a new type of records emerged: the recording of the (physically) real (indexical photography, phonography and kinematography). But these are non-archival media insofar as they do not operate on the symbolic level like the alphabetically coded traditional historical record.

- how the authority of information can be established or preserved in a new medium; digital photograph or any other document can be "altered" without (almost) leaving a trace of such manipulation; digital "forensics" (Kirschenbaum)

- with digital photography, the alphabetic re-turns in a new sense: as the regime of the alphanumeric code. The completely coded image replaces signals by arbitrary symbols which can be processed (that is, computed) algorithmically.

- photographic "archive" not the photochemical evidence but the metadata,

thus: the *paratext* (Gerard Genette), linking the analogue signals to the symbolic regime (writing codes) which is the basis of the historiographical operation. From that archival authority (contextual "situative" authenticity) the photograph derives its authenticity. "The dominant culture of photography did rely heavily on the archival model for its legitimacy. The shadowy presence of the archive authenticated the truth claims made for individual photographs, especially within the emerging mass media" = Sekula 1985: 57.

"Cold memory"? Archival times and different tempor(e)alities of of photography

- "archival time" of photography differs from the temporality of other analog storage media (phonography and kinematography); electronic media (audio and ivideo tape recording) are different in every aspect. The (almost) immediate (not in the Newtonean, but Maxwellean sense) transmission of light ("live" transmission in "Hertzean" media which are based on electro-magnetic waves) is the reversal of what the permanent registering of light (waves) on photographically sensitive emulsions (the photographic negative) embody.

- Roland Barthes: against discourse analytic deconstruction of photographic knowledge (*studium*), the photographic *punctum* insists. This *punctum* is not just of a metaphysical or affective nature, but names as well very literally the tracing of light rays. The photographic record is the negentropical inscription of one moment of light into a carrier medium. The analogue physicality of the photographic print (and its kinematographic twin) thus secures its status as historical record, different from electronic media whose essence is "live" transmission. An electronic image comes into being only by technological performance.

- "live" transmission = the characteristic of electronic (mass) media (radio, television) and at first sight looks like the very oppositive of what the almost immobile archival keeping of records over time ("tradition") is. But storage and immediate data processing are not ontologically different but differ only in scale. Let us compare the photographic moment, i. e. the fixation of a moment in time, to the immediate transmission of an electonic image in television or video: In the first case the photonic event is chemically made to have a lasting effect, whereas in the latter case it vanishes from the phosphor screen of the monitor in a fraction of a second. But even this fraction is an interval, a Delta*t*. Delta$t \rightarrow 0$. The media archaeology of photography itself reveals how the long-time, almost painterly exposure of early Daguerreotypes and Talbotypes by progressing mechanical and chemical means shrinked up to the notable photographic "click" or "shot"

- while media-archaeological reading of the archive is distancing and biased by the technomathematical analysis (the techno-*studium*), not mistaking storage for memory or even further remembrance, the phenomenological reading of the archive corresponds with the *punctum* when miracolously something like a flash crossing and short-circuiting the temporal gap between the record from the past and its present reading happens

- It an anarchival moment (that which escapes the symbolic order of archive-

based historiography) which is the signature of photographic time, as described by Walter Benjamin as a vertable media-archaeological quality. Photography occasionally provides for an almost Proustean *mémoire involontaire* which escapes all ideological manipulation, an accidental flash of the real.

- It is in photography itself - its temporal *momentum* - that the auratic moment (in Benjamin's sense) resides

- camera gives access to differend kind of nature than is usually disclosed to the human eye; thus it opens a different kind of archive of the present. Benjamins called this the "optical unconscious" <Benjamin 2002: 303> which turns out to be technological in the sense of Sigmund Freud's (and Jacques Lacan's) notion of the psychic apparatus.

[Keine Noosphäre im Sinne Teilhard de Chardins: "Es ist ja eine andere Natur, welche zur Kamera als welche zum Auge spricht; anders vor allem so, daß an die Stelle eines vom Menschen mit Bewußtsein durchwirkten Raums ein unbewußt durchwirkter tritt" <Benjamin ebd.>. Von diesem "Optisch-Unbewußten" <Benjamin 2002: 303> erfährt der Betrachter erst durch die Photographie.]

Photographies can not by themselves differentiate between the significant and the asignificant in their referents ["die Unfähigkeit fotografischer Bilder, zwischen Wesentlichem und Unwesentlichem unterscheiden zu können"[52]]

- non-hermeneutic essence is the media-archaeological virtue (not deficite) of photography as media technology, as coined in Charles Sander Peirce's semiotic as *index*. This is closer to the signal than to the sign (in terms of the "referent"), and rather a contingent, pre-symbolic, thus: an-archival trace.

- according to Ernst Jünger, media technology dematerialized modern warfare and transformed vision into a material force and weaponry; camera lens as capable of freezing the moment of danger which enframed traumatic shock in a manageable virtual format. For Jünger, optical technology creates an aesthetic of detachment as its mode of perception; the photograph and chronophotographical aesthetics "[...] has something of a telescopic quality: one can tell that the object photographed was seen by an insensitive and invulnerable eye. The eye registers equally well a bullet in midair or the moments in which a man is torn apart by an explosion"[53]

- Henry Fox Talbot explicit in the introductory words to *The Pencil of Nature*, stressing that the photographic plates therein „have been formed or depicted by optical and chemical means alone, and without the aid of any one acquainted with the art of drawing“, and media-archaeolgically radicalized the rupture with the poetics and rhetoric of mimesis, semantics and hermeneutics

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[52] Volker Wortmann, Was wissen Bilder schon über die Welt, die sie bedeuten sollen?, in: Authentizität. Diskussion eines ästhetischen Begriffs, Munich (Fink) 2006, 163-184 (180)

[53] Ernst Jünger, Photography and the second consciousness, excerpt from: same author, On Pain, in: Photography in the Modern Era: European Documents and Critical Writings, 1913 / 1940, ed. C. Philips, New York (Aperture) 1989, 207-210 (208)

of images is being defined: "The picture, divested of the ideas which accompany it, and considered only in its ultimate nature is but a succession, or variety of stronger lights thrown upon one part of the paper, and of deeper shadows on another."[54]

- field of (new) media theory is split between two very different approaches to this photographic being: "Media archaeologists describe the non-discursive practices of the techno-cultural archive, while media phenomenologists "analyze how phenomena in various media appear to the human cognitive apparatus, that is, to the mind and senses"[55]

Timeless? Entropic *versus* digital photography

- "archival" seduction of historical imagination by photography, the referential illusion of the past moment "as it actually was" (Ranke); media-archaeological gaze tries to resist, by looking at the tempo-reality of the medium itself

- two photographs: The chapel of St. George near Dobralak in the Rhodope mountains of Bulgaria (near Plovdiv). One photograph from Mai 2004 shows the unrestored chapel, the other (August 2010) its renewed state. *Geschichtlichkeit* versus *Historie* (with Martin Heidegger)? But the medium of photography is indifferent against the tempor(e)ality of its referent; its historicity lies in the entropy of its own physical state. Against this, digital photography is a-temporal, carrying the temporal trace not in its information (which is its binary essence), but in the hard- und software into which this information is embedded - thus linking to the scriptural, alphabet-based, that is: coded systems of symbolic records

- Archives emerged with the symbolical code of writing. The symbolical code can be transmitted (now "migrated") with a high degree of fidelity in copying, regardless the material support. Thus the symbolic code (like the genetic code), esp. in the alphabet, is mostly invariant towards historical, i. e. entropical time. Digital data, which is: "information", *per definitionem* (Norbert Wiener) are neither matter nor energy[56]

- authenticity in photography does not depend on the external archival frame of reference but its photographic indexicality

- tempor(e)alities of the archive: it looks like a time machine. Can photography provide us with a direct contact with a reality of the past? In a physical sense, this is true for chemistry-based photography indeed, as expressed in a writing on conservation of photography in museums: "fragile links of silver to the

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[54] London 1844; Reprint New York: DaCapo Press 1969, no page

[55] 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 (141), referring to Wendy Hui Kyon Chun, in: Chun & Keenan 2006, xxx, 3 f.

[56] See Rudolf Gschwind / Lukas Rotenthaler (interviewed by Ute Holl), Migration der Daten, Analyse der Bilder, Persistente Archive, in: Zeitschrift für Medienwissenschaft 2, 1/2010, 103-111 (104)

sunlight of our past"[57].

- archive's status as mnemonic device is manifold: on the one hand, as a certain technology of representation, on the other hand revealing its relationship with a certain modality of the past that constitutes its material basis

- indexicality of photography is a quality of its media-archaeological existence: physically being an inscription of light conserved chemically. Indexical: the physicality of the storage medium

- when being looked at not media-archaeologically but as part of historical research, the photograph immediately is subjected to contextual knowledge, transformed from media-archaeological monument to discursive document.[58]

- "Evidently a different nature opens itself to the camera than opens to the naked eye."[59]

- in English translation, Benjamin's term "technische Reproduzierbarkeit" turns into "mechanical reproduction", thus unwillingly reminding of the difference which opens with digital reproduction: a mathematization of the photographic process, a different archive. Media archaeology is about the mathematical / symbolic logic as well, not just about engineering in the traditional sense any more.

The mechanical (and then techno-mathematical) gaze opens an archive by making visible to humans what otherwise escapes the human optical sense: photo-micrography and the dynamical time axis manipulation by photography (chronophotography, slowing down and fast forwarding of motion).[60] The archive of different temporalities opens, "declassifying" time-deferred worlds: an world of what has been hidden (*secretum*) while existing nonetheless - photo-*aletheia*. Technical *poiesis* in the sense of ancient Greek *techné* as re-definied by Martin Heidegger; both artistic and technical creations modes of bringing forth, interrelated within the machine[61]

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[57] Carney E. S. Gavin, Photo-archaeology and tomorrow's museums: fragile links of silver to the sunlight of our past, in: Museum (Unesco, Paris), vol. XXXVII, No. 1, 1985, 5-12

[58] An argument in Michel Foucault, Archaeology of Knowledge, transl. A. M. Sheridan Smith [*1972], London / New York (Routledge Classics) 2002, "Introduction", 3-19 (7 f.)

[59] Walter Benjamin, The Work of Art in the Age of Mechanical Reproduction [1936], in: Hanna Arendt (ed. and introduction), Illuminations, London (Fontana Press) 1973, 238

[60] See Emely Godbey, The cinema of (un)attractions: microscopic objects on screen, in: John Fullerton / Jan Olsson (Hg.), Allegories of Communication. Intermedial concern from cinema to the digital, Rom (John Libbey) 2004, 277-298

[61] Martin Heidegger, Poetry, Language, Thought, trans. Albert Hofstadter, New York (Harper and Row) 1975, 64. See Malin Wahlberg, A Relative Timetable. Picturing time in the era of new media, in: John Fullerton / Jan Olsson (Hg.), Allegories of Communication. Intermedial concern from cinema to the digital,

- the archival = detachment: setting apart (Michel de Certeau) records from the immediate operativity called the present. Let us dare to take this detachment as signature of the archival metonymically and transfer it to ways of perception (*aisthesis*) what I call the aesthetics of the archaeological gaze.

- For Ernst Jünger, optical technology creates an aesthetic of detachment, the only mode of perception that can be commensurate to the incursions of technological shock in everyday life. Photographic detachment neutralizes social pain, for the photograph "stands outside the realm of sensibility. It has something of a telescopic quality: one can tell that the object photographed was seen by an insensitive and invulnerable eye. The eye" - different from Zeno's paradox - "registers equally well a bullet in midair or the moments in which a man is torn apart by an explosion" (Jünger 1989: 208)

- *The Gutenberg Galaxy* McLuhan links the triumph of Renaissance perspective to the rise of print culture, which correlates the mathematization of the image (previous to digitalization) with symbolical machines (printing press).

- "PHOTOGRAPHY was the mechanization of the perspective painting and of the arrested eye"; "Telephone, gramophone, and RADIO are the mechanization of post-literate acoustic space"; "We are back in acoustic space".[62] Such sonic space is understood here as the epistemological existence of sound.

- cool visual detachment of the Gutenberg galaxy is opposed to the full sensory involvement of pre-Gutenbergian manuscript cultures. The latter are said to be “intensily audile-tactile compared to print culture; and that means that detached habits of observation are quite uncongenial to manuscript cultures <...>. In place of cool visual detachment the manuscript world puts empathy and participation of all the senses”[63].

Archival nostalgia? The analog photographic print

- Oliver Wendell Holmes 1859 with regards to a photography of the cathedral Nôtre-Dame in Paris: "Form is henceforth divorced from matter. [...] Give us a few negatives of a thing worth seeing, taken from different points of view, and that is all we want of it. Pull it down or burn it up if you please. [...] Matter in large masses must always be fixed and dear; form is cheap and transportable" = Oliver Wendell Holmes, The Stereoscope and the Stereograph, in: Atlantic Monthly (1859) H. 3, 733-748 (747); Jens Schröter, Die Macht der Stillstellung. Zur technologischen Abtastung und Verfolgung am Beispiel der Fotografie und des Computers, in: Andreas Gelhard / Ulf Schmidt / Tanja Schultz (eds.), Stillstellen. Medien - Aufzeichnung - Zeit (Zeiterfahrung und ästhetische Wahrnehmung, vol. 2) 2004, 60-74; symbolic trade-off between recording media and physical matter. "From now on, form is separated from material. In fact, the material in visible objects is no longer of great use, except when being used as a model from which the form is

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Rom (John Libbey) 2004, 93-103 (101f)

[62] McLuhan, "Five Sovereign Fingers Taxed the Breath" (1954)

[63] Marshall McLuhan, The Gutenberg galaxy. The making of typographic man, New York (Routledge) 1962, 28

constituted. [...] the result of this development will be such a massive collection of forms that it will have to be arranged into categories and placed in great libraries" = quoted here from: Wolfgang Kemp, *Theorie der Fotografie I (1839–1912)*, Munich, 1980, 121; *Ge-stell* (Heidegger) of storage of these forms is, in an epoch that has brought about an audio-visual memory, no longer the library. In place of fixed order, sampling allows for the digital storage and manipulation of tones and sounds, images and glimmers

- photography has been time-analogue in terms of optical indexicality; with digital sampling, open for mathematical intelligence. Analogue photography by its very materiality inscribes traces of time, whereas in digital photography, the temporal index becomes a stamp, a date without physical evidence of aging.

- notion of "digital photography" metaphorical when perceived by human eyes; a former single physical medium like the photographic image as print does not exist behind the surface of computer interfaces but as a data format, an array of bytes which are adressed and processed algorithmically

- by November 1946, single bits could be stored (and permenently changes or refreshed) on the screen of a standard radar CRT. With the Williams-Kilburn Cathode Ray Tube memory in early electronic computing, each phosphor charge, on and off, not only represented but embodied a binary "zero" or "one". This is not video art but functional TV. Since the charge would decay within 0,2 seconds, a detector was placed in front of the CRT, obstructing human insight, allowing for an electronic beam again to refresh the charge just in time to keep it.[64] The actual observer, here, is the computer itself. In a canonical artistic engineering demonstration from 1947, the CRT was made to self-express its own number of digit capacity: "2048 DIGIT STORE". For once, the relation between dislay and computer has been not metaphorical but indexical.

- current media art, the "archaeological" use of anachronistic media like 16mm film[65] reads like a retro-effect against digital atemporality - an archaic counter-practice, archival resistance

- digital photograph preserves the iconic quality while loosing the indexical trace. Or rather, indexicality itself here is of a different kind. While the analogue photographic print keeps a physical trace of the past, recording the light intensities, the digital pixels keep a schmatic, mathematically abtracted relation to their generating (and then sampled) analogue signals - a *diagrammatic indexicality*

- Deleuzian terminolgy and re-reading of Foucault, the archive presents a kind of diagram. The multi-media "archive", rather, represents an operative diagramm, a diagrammatic machine, still topological (graphs, nodes) but with the additional dimension of temporal processes

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[64] R. B. E. Napper, in: Rojas / Hashagen (eds.) 2000: 366; Fig. 1

[65] See Malin Wahlberg, A Relative Timetable. Picturing time in the era of new media, in: John Fullerton / Jan Olsson (Hg.), Allegories of Communication. Intermedial concern from cinema to the digital, Rom (John Libbey) 2004, 93-103

- Vilém Flusser: mechanical code (formatting by the apparatus) is obtained that comprehends images. This leads one to activate the code and to create new images out of the code language[66]

Historicism and photography

- photographies from the past: the contingent might, from a later point of view, become more important than the originally intended referent - like the clothing fashion of the people passing in front of the chapel, or the tree for historical climatology. It is the contingent which short-time photography is able to catch with diminuishing time of exposure, flash-like images[67]

- Lessing 1766, notion of the "transitory"; Laocoon; or the limits of poetry and painting, transl. William Ross, London (Ridgway) 1836; chap. III, 28: All representational arts "are necessarily restricted by its material *limits* to a single instant of time." This holds true for traditional art, even more to photography, but the instant, in photography, ranges from the punctual micro-moment to long-time exposure, thus extending the presence

- photography catches interval as temporal mediality ("inbetween"): from long-time exposure (for techno-chemical reasons) to catching a moment, archiving an instant of time, a dramatic, time-critical escalation

- differentiates the punctual temporality of photography from the processual temporality of the electronic image

- technological reproduction media have a presence-generating power over human perception of time, resulting in a cognitive-affective gap within humans between historical contextualisation and temporal appeal: "In <...> sound recording the men and women of the past are present. Marcel Proust makes me think *of* bygone times. When I hear Kirsten Flagstad as Isolde, with the Royal Opera House Orchestra under the leadership of Sir Thomas Beecham, the voice of the opera legend is concretely present to my ears. The intellect tells me that the recording is 72 years old and stems from Covent Garden, but for my senses, she is with me in space, here and now" = Jakobsen 2010: 6

- On 16th August 2010, a postcard found its destination into mail box, sent by a friend from Southern France, Aix les Bains. The postcard reproduces an ancient photograph with yellow-brownish colour: L'entrée du Casinao "Grand Cercle", from the postcard series entitled "Image d'autrefois". What does it mean, this *autrefois*? very term expresses a difference to what is considered as historical time, rather displaying a chronotopical time (Bachtin), or a heterotopical time (Foucault)

- What is the photographic event? Roland Barthes, in *La chambre claire*, defines the *studium* of photography as the cognitive reading of a photography, taking it representational: as part of a given historical context and a given cultural code. But this documentary reading is broken by a medium-specific energy of

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[66] See Vilém Flusser, Für eine Philosophie der Fotographie, Göttingen (European Photography) 1984

[67] Walter Benjamin, <Über den Begriff der Geschichte>, in: ders., GS, xxx

photography: the *punctum*, an affective impuls which "like an arrow" (Barthes) cuts through the contextual, historicizing reading, like a *stigma*. Barthes calls it "a little hole" - as if the Lacanean *real* opens hier, for a moment/um (both a temporal and an epistemic moment, an eventuality of temporal suddenness, closer to the digital impulse)

- cognitive vs. the affective message of a photography in the archive corresponds with two ways of reading it: as archive-related (the media archaeological view), and as related to human interface perception (the phenomenological view)

- while media archaeology, after Foucault, describes the non-discursive practices of the techno-cultural archive, media phenomenologists analyze how phenomena in various media appear to the human cognitive apparatus (mind and senses); Wendy Hui Kyon Chun / Thomas Keenan (eds.), New media/old media. A history and theory reader, New York (Routledge) 2006, 3 f.

- inbetween the "real" and the "imaginary" (historical discourse): the symbolic regime: (photographies as objects in the archival regime / subject to metadating)

- the historical method with its claim that the historian's task is "how it really was" / "how it actually happened" (Leopold von Ranke) co-emerged with early photography (and the period room museum aesthetics): "bloß zeigen, wie es eigentlich gewesen". Tracing shadows (like Etienne de Silhouette did) in a way that follows the physically (or in Lavater´s ambition: physiognomic) given rather than pictorial conventions (like painterly portaits) opens a fundamentally different regime of signal processing. Fidelity of translation ("une tradiction littérale" writes Barante) - culminating in the daguerrotype which "automated" visual translation = Bann 1974: 91, 95 f.

- Bann, *The Clothing of Clio*: technical registering the past belongs to a different semiotic regime than narrative history = Bann 1984: 135. Media-archaeology is (in uncanny alliance with Ranke´s option) on the side of the indexical

- Hayden White´s *Metahistory* ultimately does not lead to "data-banks as symbolical form" (Lev Manovich) but to a plea for narrative emplotment of the past in the self-ironic mode. The aesthetics of computing (rather in a tradition since Roman and medieval annalistic registering of events) differs epistemologically from historical discourse: Hayden White, The Value of Narrativity in the Representation of Reality, in: Critical Inquiry vol. 7, no. 1 (1980), 5-27 since historiography belongs to the symbolical order (operating with alphabetic symbols) while photography belongs to the (physically) real; engraving of light beams onto a chemically sensitive surface (epitomized by television which does not store but immediately transfer light)

- concentrate on the non-discoursive elements in dealing with the past: no the speaker´s agency, but rather the machinic agency; cp. Bann 1995: 80. While Ranke´s historiography tried to efface the speaker´s marks in order to let an objective "pastness of the past" appear <ibid.>, technical media do this. The camera eye deplaces the subjective vision - which allows for a sharpened reading of count Paul Yorck von Wartenburg´s comment on Ranke´s

historiographical aesthetics as "ocular" = letter Paul Yorck von Wartenburg to Wilhelm Dilthey dating from 6th July 1886: "Ranke ist ganz Auge als Historiker, <...> es ist ein Geschichte sehen <...> Ranke ist ein großes Okular", as quoted by Martin Heidegger, *Sein und Zeit*, Tübingen, 1980, 400; artefact of the camera objective enters the stage. When Leopold von Ranke declared his mythic vanishing point of "describing just what actually happened"[68] in history as a neutralization of his subjective stance as author of historiography, this apparently corresponds with the new objectivist aesthetics of photography

- William Henry Fox Talbot, *The Pencil of Nature*, London, 1844, and H. D. Gower / L. Stanley Jast / W. W. Topley, *The Camera as Historian*, London, 1916

- Ranke wrote in the presence of the then "new" media: the panorama (1808 Schinkel displays in Berlin his panorama of Palermo) and diaphanorama (Frank Niklas König); 1822 Louis Jacques Mandé Daguerre opens his first diorama in Paris, while Joseph-Nicéphore Nièpce´s first experiments with photographic representation (dating back to 1822) would hardly have been known to Ranke; inbetween dividing line between techniques of visualizing history scenically and the strictly technical medium of photography

- Ranke's quasi-photorealistic imaginary to let - from historiographic records / symbolic order - the past be represented "as it really happened" = Bann 1978: 265

- with emergence of photography, the theatrical gaze of "staging the past" (to quote another chapter from Bann 1995) is displaced by the cold machinic eye, a technically neutral code instead of a subjective discourse. The vanishing point in perspectival pictures (and successively media like photography and film) since the Renaissance has been a literally *theoretical* formalization, even mathematization of the subjective betrayer (the "I/eye"), an exteriorization of the human eye by technical optics. "As McLuhan and others have suggested, the simultaneous development of perspective theory and printing technology imposed an increasing degree of abstraction upon Western systems of communication, substituting an idealised `vision´ for the close conjunction of visual and haptic skills which characterised <...> the reading of a medieval illuminated manuscript" <Bann 1990: 116>. Finally photography (as notoriously explained by Roland Barthes) annihilates the distance between *Dasein* and *Dagewesensein*, the gap between past and present <Bann 1978: 264> - this has actually been ("ça a été"[69]). At the same time - and here enters Stephen Bann the artist - a photography documents exactly the absence of this particular moment which has passed. Together with Bob Chaplin Stephen Bann created *A Mythic Topography*, a series of prints such as "Jullieberry Downs. The

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[68] "Bloss sagen, wie es eigentlich gewesen": Leopold von Ranke, Preface to his *Geschichten der romanischen und germanischen Völker von 1494 bis 1535* (1824), VI; both the translatability and the implications of this phrase are discussed in: Stephen Bann, The Clothing of Clio. A Study of the Representation of History in Nineteenth-Century Britain and France, Cambridge (Cambridge UP) 1984, 8 ff.

[69] Roland Barthes, *Die helle Kammer*, Frankfurt, 1985, 90; orig. *La chambre claire. Note sur la photographie*, Paris, 1980

Absence of the Past"[70], a diptych displaying the photographic presence of a landscape devoid of evident historical marks but receptive for the injection of historical imagination which can fill that gap - thus the visual evidence is a "cold medium" of the past as opposed to "hot" historiography (according to Marshall McLuhan´s notorious distinction in *Understanding Media*).

- as long as representation of colour not available for photography (until around 1900), the new medium remained rather on the side of archival, text-based and thus black & white - printing page aesthetics of registering the past coldly - as opposed to painterly anmination and historical imagination.

- photography does not recall the past into imaginary memory; its mnemic energy does not reside upon the presence of a spectral referent, but in the physical event: Rays of light, which emanated once from a real object, touch the viewer upon regarding the picture.[71]

- beyond rhetoric of metonymy or synecdoche, the chemical essence of photography indeed registers the physical trace of light beams which one illuminated the photographic plate

- Photography did what Foucault claims in the introduction of his *Archaeology of Knowledge*: suspending the past from historical discourse (which is always anthropomorphic), in order to make source data accessible for different configurations. When literary strategies of historiography are being replaced by "an appropriate technical means for signalling the purity of the historical code" <Bann 1978: 263>, the rhetoric of media (which is a technical figure of *dissimulatio artis*, a dissimulation of the mechanistic) substitutes the former episteme. In the same manner like history in Romanticism became seemingly real "through the fiction of the transparency of historical discourse" <Bann 1978: 263>, the blueprint for media was set.

- historian's ambition to let the archival record speak for itself; visual equivalent in the notion of an unmediated registration of the reality of the past" = Bann 1995: 127 f.; no representation ever un/mediated. Like the rhetorical *dissimulatio artis* in Ranke´s historiography which aims at an apparent self-expression of history, technical media make forget their technical operativity on the machine-to-human interface in order to let the illusion of pure "content" appear; only in a moment of technical break-down the medium becomes visible

- illusion of lifelike presence in the museum, corresponding with the "photo-realistic" idea of an unbiased historiography; referential illusion of a possibility to "live the past" created; Stephen Bann, Living the Past, in: Bann 1995: 130-162 (146)

- photography not only the object of research of media archaeology, itself a media-archaeological way of remembering the past in a way radically

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[70] Referring to Hilaire Belloc, *First and Last*, London (Methuen) *1911, 3rd edition 1924, "The Absence of the Past", 48-52

[71] See Wolfgang Beilenhoff, Licht - Bild - Gedächtnis, in: Anselm Haverkamp / Renate Lachmann (eds.), Gedächtniskunst, Frankfurt/M. (Suhrkamp) 19xxx, 444-473 (447)

alternative to history. All of the sudden, the historians´ desire to preserve the original sources of the past becomes true - for the sacrifice of the discursive

- detached observer is the camera. Past, archive and history fall apart, as different registers and regimes; technical media do not really belong to the semiotic regime at all, rather to signal processing).

- technical difference between the French Daguerrotype and the British Talbotean negative/positive-technique corresponds with two different discursive emphases: "Daguerre (the showman of the diorama) exemplifies the notion of the photograph as `fairy work´, in the sense of projection into an imaginary space <...>. Fox Talbot (at any rate with his initial, `photogenic´ process) emphacises the possibility of `close contact´, of an indexical link between the image and its referent" - in fact a reproduction with a (in itself technically time-crucial) "signature in time" <Bann 1984: 134>. The former antiquarian phantasma - the direct touch with the past via the archaeological fragment"[72] - is being automated

Dis/order in photographic archives

- film directors learned to let images develop a drama within its own medium = "<...> daß die Bilder im eigenen Medium die Handlung weiterentwickeln würden": Béla Balázs, Der sichtbare Mensch, in: Schriften zum Film, Bd. I, Berlin (Henschel) 1982, 63

- once digitized, electronic image is open to almost real time access and new search options like similarity-based image retrieval; at the same time, the "virtual" essence of the electronic image becomes more fragile and subject to alteration than ever

- traditional architecture (*tectonics*) of the archive is based on classificating records by inventories. This is being replaced in the digital media by order from fluctuation, that is: dynamic order. *But this is an "archive" no more*, but algorithmically ruled processuality.

- digitally sampled into the symbolic order, images can not only be retrieved as contained in their frames, but even by their atomic elements, pixelwise. Thus even what has not been meta-dated at all by human indexing can be automatically retrieved, opening new options of visual memory (be it in photography, be it in film).[73] Such a distribution of image elements does not belong to the library or the traditional archive any more, but builds up a new, mathematized generative principle, thus: an archive in the Foucauldean and Shannonean sense, being based on information itself. This new panopticism is being applied by commercial and military agencies already. New software like Microsoft's *Photo DNA* which allows for the automated idenficiation of - for example - child pornography on websites already indicates by its name that the basis of biological and technomathematical life forms start to converge.

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[72] See Stephen Bann, Clio in parts, in: Perspecta. xxx

[73] Harun Farocki, Arbeiter verlassen die Fabrik, in: Meteor – Texte zum Laufbild, Nr. 1 (Dezember 1995), 49-55 (50)

- new electronic media like video appeared like being integratable smoothly into the traditional archival system. But in themselves they already represented a radical alternative to archival order.

- nostalgia for archival order is of course a phantasm surviving from the age of print. The alternative is a media culture dealing with the virtual an-archive of multi-media in a way beyond the conservative desire of reducing it to classificatory order again. Data trash is, positively, the future ground for media-anarchaeological excavations; on recycling: the Redundant Technology Initiative (http://www.lowtech.org) and Mark Napier´s www.potatoland.org

- instead of thinking the archive in terms of order by classification, we have to think entropically, that is: allowing for a certain amount of disorder, which contains, according to communication theory, a higher measure of (possible) information

- in lecture under the title "The Storm-Cloud of the Ninetenth Century" Ruskin in 1884 implicitely replaced the museum like concept of classification by a theory of an archive *in motion*, a kind of steady-state. Instead of the order of things attributed to culture within the well-known Victorian museums, Ruskin founds in the weather a thermodynamic phenomenon which brings forces into play that radically alter ordinary mechanistic representation of nature: *order by fluctuation*, a form of order understood as process rather than state. Entropy - the conceptual enemy to the traditional archive as authority of tradition - thus is not just the negation of order but rather its alternative, "an organizing principle of disorder" that all of the sudden makes sense when observed from on high <Richards 1993: 86f>. Such analysis oscillates between the micro- and the macrophysical level and results in cultural and even political aesthetics. Cloud modelling (developed for weather forecasting) is the name of the challenge to answer this anarchivic dynamics by fast calculation

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The acceleration (temporalization) of the archive

- conditions of archiving challenged by current regime of *online* communication; photography from the beginning not just about permanent fixation of images but as well about immediate transmission; Alexander Bain already in 1844 invented a system for image telegraphy. With photography, the image not only became durable but as well in an antithetical way evanescent - a tendency enhanced by the very nature of the electronic image (*fluxus* in every sense), and in the age of digital media the image becomes coded information in a channel.

- in terms of an auto-associative network, an electronic switch-principle for visual memory is being discussed for explaining image generation in the brain (esp. in the cortex region):

- auto-associative networks, in computer science, with properties comparable with human visual memories. "You have to imagine a matrix of parallel-switched neurons whose synoptic links react on themselves in loops with the aim of being able to store a great deal of content at the same time" = Schulz ibid., 27

Image archives on the threshold of their digital approachability

- visual search engines dealing with "semantic" queries still in their infancy; crawling the web for illegal trade-mark copying. "Search & destroy": Let us not forget that „the similarity-based images retrieval technology is either militarily or commercially, not really culturally driven“ (Lev Manovich). In his film called *Eye / Machine*, the film maker Harun Farocki draws our attention to *operative images*; so-called intelligent weapons become data-driven by matching images, not pre-directed by meta-data any more

- iconological heritage and cultural semantics hinders analysis of imagery; rather Manovich's "visual analytics" (Digital Humanties). "Humans are much better than computers at extracting semantic descriptions from pictures. Computers, however, are better than humans at measuring properties and retaining these in long-term memory. On of the guiding principles used by QBIC is to let computers do what they do best – quantifiable measurements – and let humans do what they do best – attaching semantic meaning" = Myron Flickner et al., Query by Image and Video Content: The QBIC System, in: Maybury 1997: 7-22 (8) - which establishes a feedback-loop between man and machine and stages the difference between analogous and digital data processing, thus not trying to efface, but to creatively enhance the human-computer-difference where they meet on the interface

AN ALGORITHMIC APPROACH TO CINEMATOGRAPHICAL IMAGERY

Visual archiving: Sorting and storing images

- image processing within computers radically differs from the iconological / logocentric semantics of cultural vision

- algorithmically "intuitive archives" (SOM / Legrady); modelling similarity, alternative to meta-data annotation; query by visual example; automatic feature extraction; not replicate human behaviour

- microblogging platform www.tumblr.com for photo, text and video as anarchival order clustering in current media culture: throw images into the computer and see how he, the computer, orders it; adjust humans to understand computer perception

- 24 frames/sec. already realize a definite form of image sequence / sorting; non-narrative "photofilm"

Moving image retrieval

- basic unit of video to be represented or indexed usually assumed to be a single camera shot, consisting of one or more frames generated and recorded contiguously and representing a continuous actionin time and space. Thus, temporal segmentation is the problem of detecting boundaries between consecutive camera shots; definition of a suitable *quantitative* difference metric which represents significant *qualitative* differences between frames = Zhang et al. 1997: 142

- truly "image"-based retrieval of digital image banks = using statistical object modelling techniques (so called Hidden Markov Models, probability scores which are deformation tolerant), i. e. the user searches an image database intuitively by applying simple drawings, sketches

- options (beyond archival meta-data) of re-arrangting "found footage" in algorithmic ways, as opposed to the idiosyncacies of previous filmmakers; technology of the cinematographic apparatus for cutters / the completeley different electronic video image; not taken as simply "zuhanden" in hermeneutic analysis; media archaeology aims at openng machinery as "vorhanden"

- visual archive rather as a CD-ROM which can be read/seen vertically and horizontally, i. e. paradigmatically and syntagmatically, different from the linear reading of analogue film and video

Excavating the cinematographic archive

- the hidden "time" (= cutting) machine of the film event, its montages hidden behind the apparent narrative

- with film, a different aesthetics in the succession of images techically enters, to achieve the illusion of continuity in time and space; actual cuts are dissimulated. Karel Reisz, The Technique of Film Editing, New York 1968; differences in image (frame) sequences can - by cutting - result in coherent units of perception. This allows for searching films according to these rules of organization of images

- digitizing every fifth film frame and letting his program arrange the iconic data bank according to pictorial similarities, identifying and counting with differences of objects (shapes, colors) in digitized images. While the single film frame becomes two-dimensional pixel format, their sequence results in three-dimensional vectors (Knuth 1973); extend Quadtrees unfold to Octrees, from 2^2 to 2^3 branchings per knot (Samet 1990); mathematical transformations (Fourier or Wavelet) rather differentiate than recognize images according to similarities

- digital visual archive is calculable, thus counting images by numbers not only externally (as suggested by Peter Greenaway in his experimental film), but

internally as well. To play a bit with German words: The digital image-based archive will be accessible only in a media culture which is not tempted to defigure archival memory by historical narratives (*Erzählung*), but by counting (on) it (*Zählung*); rhetorical tradition of iconic *ars memoriae* displaced by Cartesian analytic geometry which replaced images by numbers (Frances Yates); addressability not simply of single photographic frames but down to every single pixel in an image (or image sequence) once it is digitized; media archaeology focuses on this decisive rupture in how to approach image - from cultural memory to discrete archive

Kinetic im/mediacy: towards a dynamic technology of moving image retrieval

- expressing pictures by numbers undermines dichotomy between image and meta-data; rather an implosion of images into algorithmic space

- "Digital Computers introduce a consideration not found in kinematic analog computers, namely, the ordering of computation steps in time. In a vague sense, therefore, digital computation is dynamic in character" = Stibitz 1942b, 3 - all the difference between the physical meaning of "energetic" and "kinetic", equalling impulse vs. wave

- kind of second-order visual knowledge, cartography, diagrams - infomapping; visual culture still dominated by semiotically iconic, photographic-like images in the twenty first century; genuinely computer-generated visual information, closer to diagrams than to "images", eventually takes their place and enables unprecedented types of visual representations; Constant Active Archive initatives

- conventional videotape extraction in archives of moving images by the grip not on the single frames (like in post-production editing tools like AVID) or even picture elements, but on the whole tape, the storage medium only - entering the archive, but not accessing its smallest elements (ancient Greek *stocheia*, name for both physical atoms and alphabetic letters or mathematical numbers)

- aesthetics of image-based image retrieval based on visual patterns rather than verbal metaddata, "read" by computer scan / algorithms in a way familiar to pre-modern order of things (Foucault): "as comparative contingencies or juxtapositions, as a system of potential *matches*" = Claire Preston, In the Wilderness of Forms: Ideas and Things in Thomas Browne´s Cabinets of Curiosity, in: Neil Rhodes / Jonathan Sawday (eds.), The Renaissance computer: knowledge technology in the first age of print, London / New York (Routledge) 2000, 170-183 (174 f.)

- www.suchbilder.de: Pixel migration, matching by colour similarity values

A real archive of movements: The *Encyclopaedia Cinematographica*

- *Encyclopaedia Cinematographica* attempted to sample 2-minute sequences of movements (mostly animal motion, occasional ethnologic recording, a few

machines) up to 4000 films, 1952-1994; project ends with availability of mobile videography / camcorder; media-archaeological recursion of Muybridge's *Animal Locomotion* / Marey's chronophotography

- EC archive where the recording itself is the message: literally cinematography; elementary movements (composed of so-called "Kinematograms") gains its coherence not from external (i. e. alphanumeric, metadating) criteria but from a matrix of movements itself

- EC comprises non-animal "dance" as well: inanimate matter (physical material); (mostly) animal locomotion, rare ethnographic dance recording