

# From Media History to *Zeitkritik*

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## Abstract

Wolfgang Ernst, Professor of Media Theories at the Humboldt University in Berlin, has become known through his work on media archaeology. Hence the inclusion of this translation represents an alternative take on cultural techniques. It places the legacy of cultural studies, or *Kulturwissenschaften*, in an interesting tension with the different epistemological demands that technical media impose. After Vico and Dilthey, argues Ernst, we need to investigate the specific modes of knowledge that technical media propose to cultural techniques. Ernst's media archaeology and the slightly different approach to cultural techniques found in some other contributions in this issue can be seen as two of the most intriguing ways in which current German media studies has been developing in relation to Friedrich Kittler's impact. For Ernst, this has resulted in a more technical focus and also in the development of critiques of temporality that go beyond media history. Ernst argues that media temporality is not to be understood only through the cultural history of media technologies, but also how media technologies produce time. Machines have their own specific temporality, *Eigenzeit*. It is in this context that the article discusses the different approaches to cultural techniques, taking into consideration the specific time-critical and epistemic implications of technical media.

## Keywords

cultural history, cultural techniques, epistemology, media, media archaeology, media theory, temporality

The present article does not primarily focus on the alliances and distinctions between cultural theory [*Kulturwissenschaft*] and media studies [*Medienwissenschaft*] as academic disciplines, but rather questions the discursive mode that spans both subjects: the *historical* inquiry into the things that shape culture.<sup>1</sup> Technical media are neither the apex nor the driving force of culture, but rather a constitutive element of its

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history. Consequently, the history of media must be written as a history of cultural techniques. Media are a part of cultural history and culture can be read as a function of media history. Both forms of history share a common focus in the concept of ‘cultural techniques’. Epistemologically speaking, this is a rather harmless claim: after all, the humanities have learned to look at matters historically and render them as history(ies) ever since Vico and Dilthey. As long as there is agreement on this point, defining media history in terms of cultural history and cultural history as a media effect will always be mutually implicit. The question still remains whether there is anything about technical media that eludes the realm of history, its narrative model or even, ultimately, culture itself. To a certain extent, it seems obvious that all media innovations are culturally determined – a premise culminating in the *new historicist* view that affirms both the textuality of history and the historicity of texts. But this chiasmic historical model calls for a supplement: the assumption of an inner logic of media development that literally introduces a third element to the Promethean dichotomy of culture and nature.

Anything and everything associated with the term ‘media’ can, of course, be included in the discursive framework of cultural history. That inclusion, however, would jeopardize the accuracy of a term that refuses to label anything and everything as media, but rather seeks to account for discontinuities, in order to grasp media-epistemological escalations (Bachelard, 1974; Canguilhem, 1979). Michel Serres distinguishes between techniques and technologies – a distinction which also applies to the difference between cultural techniques and media technologies. He contrasts the ‘hard’ machinery of the Industrial Revolution, functioning on the basis of thermodynamics, with the ‘soft’ negentropy of information technology: ‘I therefore reserve the term “technology” for those types of artefacts that negotiate signs – and thus the logos – and contrast them with “techniques”, whose energetic scope is  $10^{16}$  times higher’ (Serres, 2002: 194).

Speaking of the frequent confusion between the stroboscope and the afterimage effect in the transmission of visual perception, Bernhard Siegert stresses ‘how fundamentally the media-theoretical discourse is in need of a media-historical framework of analysis to match media’s inherently high physical and mathematical standards’ (Siegert, 1996: 8). And, indeed, the history of knowledge and technology serves as a necessary test for all media theories. But media archaeology does not merely reconstruct historical media practices; it also reflects on their time-building, chronopoetic processes – thereby raising a challenge to history.

### **Cultural History with Media History – A *Liaison Dangereuse***

The field of *Medienwissenschaft* also fulfils, at many universities, the function of *Kulturwissenschaft*, or else works in close cooperation with it (Dotzler, 2005). This privileged proximity is rooted in the fact that both

disciplines (in contrast, for instance, to what is known as ‘cultural studies’) deal not merely with the discursive software of culture, but also with its material hardware. But while *Kulturwissenschaft* prefers to read media techniques as a function of historical processes, media archaeology takes the opposite perspective: here the model of history itself appears as a function of cultural (symbolic and signal-based) operations.

To this day, the field of *Medienwissenschaft* draws on the resources of cultural history, which emerged in the 19th century both as an academic practice and a research *dispositif*. This is precisely why it is vital to analyse the media-based conditions of such a large-scale, worldwide labour of collecting, archiving or museumizing. So, for example, the postal system (transmission) and the archive (storage) became conjoined when Erich Moritz von Hornbostel ordered Edison cylinders with musical recordings from all over the world for his Berlin phonographic archive, with the idea of developing the field of comparative ethnomusicology (Klotz, 1998). The notion of culture that governed the projects involved in collecting knowledge around 1900 had become identical to the storage media it generated. In its materiality, culture thus reveals itself as an object of research for the study of storage and transmission techniques. Chronology, diplomacy, epigraphy, genealogy, heraldry, numismatics, palaeography, sphragistics, historical cartography: these so-called ancillary disciplines of history, which identify and analyse their objects with regard to their usability as cultural data storage devices, acquire the status of media archaeology *avant la lettre* and are intimately connected with the category of *Kulturwissenschaft*. As a result, culture becomes calculable; it is a function of mnemonic strategies and transmission techniques, as well as their respective institutions.

The analysis of media techniques and material culture is a joint endeavour of *Kulturwissenschaft* and *Medienwissenschaft*. Marshall McLuhan famously analysed the psycho-technical effects of media as operators in the cultural matrix. But what happens if such media technologies no longer operate in the familiar context of culture but form a world in their own right? A notable difference between *Kulturwissenschaft*, on the one hand, and *Medienwissenschaft*, on the other, lies in the fact that the former is primarily interested in discourses, while the latter places a much stronger focus on non-discursive aspects. In contrast to the field of *Kulturwissenschaft*, which tends to interpret experimental arrangements as semantic spaces, media archaeology (much like Gaston Bachelard’s epistemology) seeks to maintain spaces of contingency (see also Rheinberger, 2001). The cultural techniques that generate discourses are precisely those that are not already discursive effects. The inquiry into what constitutes ‘existential’ historical differences – so to speak – sets the study of cultural techniques apart from the kind of cultural research that not only carries ‘media’ in its name but also engages with media’s intrinsic perspective and specific inner temporality

[*Eigenzeit*] in a kind of reverse hermeneutical move. On the one hand, this means programmatically positioning media theories within concrete spaces of cultural practices. However, media archaeology is not to be confused with *Kulturwissenschaft*. Writing, reading, counting, networking and representing are symbolic techniques which generate culture as a recurring and normative formation. They transform a priori concepts of space and time into an analysis of concrete spatial and temporal systems. Media archaeology does not conduct this analysis on the level of macro-cultural production, but rather on the level of micro-technical operativity. In contrast to *Kulturwissenschaft*, which starts from grand narratives (histories of culture, science or even knowledge) to arrive at concrete particulars, media archaeology operates on the assumption that technological media systems can be understood primarily and conclusively on the basis of their elementary, sub-semantic procedures. This type of analysis, which understands material, symbolic and signal-based operators as escalations of classical cultural techniques, requires a theory of genuine media-temporal processes.

Traditional media history and cultural history are in agreement on how 'organ projections' and the *extensions of men* (Ernst Kapp, Marshall McLuhan) have developed into culture's servomechanism. Anthropocentricity thereby turns into a perspective which increasingly views man as codified (or even programmed) by cultural techniques and media technology. To paraphrase Günter Anders, media theory actively pursues the 'antiquation' of man by distancing the subject-centred perspective through apparatus-based *theoria*, that is, through the algorithmic processes of technological media themselves. In traditional cultural history, culture appears as a process of progressive semantification, which produces and reproduces resources of meaning, but which also undermines and destroys them. In this sense, it combines media research with cultural semiotics, which understands culture as a form of poetics (Böhme, 2004: 23). Cultural history thus remains on the symbolic and semantic level. In contrast, media archaeology stresses the syntactic aspect: the processing of signals rather than the signs themselves. The so-called *Medienkulturwissenschaft* (a hybrid of media studies and culture studies) develops theoretical models that understand aesthetic and technological changes as semantic shifts. A study of media time [*Medienzeit*] that is grounded in communications theory, on the other hand, intentionally keeps its distance vis-à-vis historical formations of meaning.

### **Cultural History with Vico**

Media theory tacitly becomes *Kulturwissenschaft* when it is translated into the discourse of history: in other words, when all temporal signs are translated into the kind of history that Giambattista Vico defined as

the realm of humanity – and thus the realm of culture – in his *Scienza Nuova* (Vico, 1948). According to Vico, all historical products are comprehensible to humans precisely because they were produced by humans. Vico's foundation for all studies of culture was written 'in explicit opposition to modern (natural) science' (Kittler, 2000: 16). The new discipline dealing with the common nature of all people contested René Descartes' attempt to elevate the principles of modern mathematics and science to all-encompassing philosophical principles – the attempt to extract the algorithm of the historical development of culture. Vico critiques a mathematical analysis, which increasingly deprives its objects of their embodied corporeality. Yet disembodiment characterizes the current state of information technology. Following the principle of mechanics according to which the geometrical representation of any phenomenon enables its mechanical reconstruction, mechanical physics is called upon to describe natural phenomena based on their mode of production (Fellmann, 1976: 185). In contrast, Vico (1948: 93) assigns human affairs a greater degree of reality than geometrical points, lines, areas and shapes can represent. According to Vico, we can prove geometry, because we produce it. When we can prove the physical realm, we will produce that as well. The basis of modern media is precisely this kind of mathematics, which already constitutes an epistemological step beyond traditional cultural techniques. The Turing machine thus became the first strictly theory-born medium. Engineered as a von Neumann model, this diagrammatic media theory has advanced to an omnipotent medium. Its logic, however, does not belong to this, that is to say, to the historical world.

The question of cultural history literally brings forth its media-archaeological alternative. According to Vico's *Scienza Nova*, the realm of history is the *autopoiesis* of culture: since the historical world is man-made, its essence can also be found at the level of our own mental transformation. Here, the creator is also the narrator. At first glance, this reads like an argument for rendering media time in terms of cultural history. But upon a closer look, Vico's opposition to Cartesian mathematics no longer applies to those things that can only be *counted*, rather than *recounted*, or those that are themselves limited to the act of counting (the *computer*). The category of cultural techniques bridges this divide. Ernst Kapp's treatise *Grundlinien einer Philosophie der Technik. Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (1877) provides a response to Vico's axiom, by aiming to submit technology to a process of 'reflective analysis'. At first glance, with his notion of 'organ projection' Kapp seems to embrace the perspective of cultural anthropology, and yet he ends up calling the steam engine the 'machine of machines'. This is the point that marks the closing of the technological feedback loop: the autopoietic emancipation of technical media from their direct link to a cultural environment. Max Bense calls this cybernetic revolution 'machine metatechnics' (1998: 429) – something that

detaches itself from cultural history on its own terms. Thus media technology gains autonomy from culture. The technological feedback loop (the cybernetic marriage of machine and mathematics) puts forth a mode of knowledge that is no longer subject-centred and therefore also defies historicization. But knowledge that is no longer subject-centred becomes information. Today, information belongs to the sphere of electronic circulation and the coupling of one piece of information to another no longer relies on the guidance of cultural knowledge (Schulte-Sasse, 1988: 451).

### **Media Time Processes and Their Break from Cultural History**

Media archaeology employs an analysis of media communications that is far removed from cultural semantics and concerns itself not only with cultural techniques, but also particularly with technology and technological mathematics; it therefore places an additional focus on non-cultural input. In a segment titled 'Movement and Time', Gustav Deutsch's film *Film ist* [Film Is] (made in Austria 1998) shows medical X-ray footage of a speaking larynx. In this case, the medium speaks for itself, producing the same effect as the invention of the vocal alphabet in ancient Greece, which not only created the possibility to record – and thus store and transfer – oral poetry as a stream of phonetic utterances, but also allowed objects like drinking vessels and tombstones to speak to the reader in the first person via their inscriptions (Ernst and Kittler, 2006). The scientific observation of a speaking larynx in sets of 12 to 24 X-ray images per second is no longer conditioned by the human eye but by the eye of the camera or even that of the X-ray cathode. Only technical media are capable of manipulating, decelerating and accelerating moments such as this in a time-critical manner.

This also explains the title of the film: it announces the media-archaeological level in the existence of the apparatus, which – to paraphrase Foucault – corresponds to a monumental, discrete aesthetic, distinct from the documentary perspective of cultural history. As functions of a process of transmission, technologically generated signals are the messengers of other things; at the same time, however, every electronic image, every electronically (re)produced sound is always also a monument to itself, to its technology and – even more radically – to the computer program which created it. This amounts to media self-reference. Media technology thus emerges from culture as an autonomous entity – a process that manifests itself via the technical feedback loop (the cybernetic paradigm of machine and mathematics). The development of feedback routes – as James Clerk Maxwell's *On Governors* (1868) had already shown prior to all explicit formulations of cybernetics – increasingly separates media systems from the discursive streams of culture. Thus,

automation is defined precisely by the fact that 'human controls have been disabled' (Szameitat, 1959: 316). When in contrast to Vico's self-referentiality of culture and history the field of electronic media is accessed in terms of the electromagnetic field, this distinction places technological media in opposition to traditional cultural practice. To remain within the terminology of electromagnetism: with media, there is only mutual induction. The discovery of electromagnetism – theoretically posited by Faraday, mathematically calculated by Maxwell and ultimately empirically proven by Hertz – overcame the search for a representation of humanity in nature, and instead defined it as a set of processes that open up a new field between physics and culture. 'We must therefore understand the knowledge of electrical phenomena and their application as an exclusive product of the human intellect' (Liesegang, 1891: X). By using electricity, man has surpassed nature, and not simply performed an act of organ projection. 'Once it is possible to animate an automaton that is better constructed than man himself, the world has reached its ultimate purpose' (1891: X). The media processes that are thereby set in motion no longer exclusively belong to either nature or culture. The Greek term *nómos* already implies a departure from *physis*, from nature itself (Vretska, 2001: 503). Faraday taught us to understand this field as a form of independent reality with an intrinsic dynamic, detached from the corporeal realm (Weizsäcker, 1974: 147). In doing so, he opened up a space for temporal and spatial free play (in the sense of Schiller's '*Spielraum*'). If we are destined to face the advent of techno-mathematics and live by its rules, we will certainly find that it derives not from cultural history, but rather from Riemann spaces, where time and space become conflated. The Michelson-Morley experiment from 1887, which famously failed to prove the existence of 'ether wind', was followed by the provocative Lorentz contraction theorem: instruments of measurement expand or contract along with the ether. Although this explanation is considered obsolete today, it still holds the appeal of an alternate model of conceptualizing non-historical time in what is called culture.

There are numerous pleas for media culture studies and for culturally oriented *Medienwissenschaften*. But this inclusion of media knowledge under a cultural horizon proves to be a Trojan horse. When culture no longer operates with primary natural 'media' (air, water) alone and also posits no imaginary substances ('ether'), but rather – as in the case of electromagnetic carrier waves – forms its own media channels that can be both artistically and artificially *modulated*, the combination of media produced by cultural techniques and human speech acts generates the uncanny, siren-like attraction of media technology. Precisely because 'the Sirens, who were only animals... could sing as men sing, they made the song so strange that they gave birth in anyone who heard it to a suspicion of the inhumanity of every human song' (Blanchot, 2003: 3).

The temporality of media transmissions induces a similar discomfort. We obviously know that Hitchcock's *Psycho* is a historical film document every time it airs. But in the technical moment of transmission, it is actively present (unlike a painting in a museum) as an electromagnetically induced process that shoots through our sense of time like an electric surge. The result is cognitive dissonance: the subliminal perception of the present, but with the cognitive awareness of an alternate perspective, namely that of the past.

What happens when waves are no longer oceanic matter (as in the *Odyssey*), but rather a matter of high-frequency technology? A study launched at Berlin's Humboldt University in April 2004 proposed to examine Homer's siren motif from the perspective of acoustic media archaeology (see Ernst, 2004: 256–66). Only through the technological act of measuring can the sonic element, as the most fleeting of all cultural goods, re-enter cultural memory. But by the same token, historical recollection is de-historicized and the cultural-historical model is replaced with technical parameters of measurement. On the one hand, media archaeology is an ancillary discipline of cultural memory; yet, on the other hand, in terms of its media-epistemological focus, it is a technology capable of training the visual and acoustic senses for non-cultural objects. Technology is thus no longer an organ projection of nature. As the result of a technological culture, products of nature 'effectively become technological artefacts' (Böhme, 1992: 118). Speaking of the magic produced by the nightingale's song, Kant points out that, in the absence of a bird, it has not been unusual for men 'who knew how to produce this sound exactly like nature' to hide themselves in a bush instead (quoted in Böhme, 1992: 119). Once analytical media have measured the frequencies of sounds, they are able to synthetically subvert the sonic difference between humans and machines. Eduard Rhein (1939) illustrates this point with a radio broadcast of a singing nightingale recorded in nature. When nature itself becomes reproducible, it also becomes technically legible. The age of the baroque cabinets of curiosities had an impartial view on these matters. 'Nature is . . . an infinite resource for artificial machines that surpass all human inventions' (Sulzer, 1750: 39). Radio waves are not unnatural (*para physin* – according to Aristotle's *Physics*); rather, they reproduce the secret of their own wave movement in a generative kind of *mimesis* (Koller, 1954). Artificial nature is media culture: 'The spoon has no original other than the idea in our mind', argues Nicholas of Cusa's treatise *De mente* (quoted in Blumenberg, 1999: 534). 'One can conceive of life forms which only reproduce in constant symbiosis with machines. Under such circumstances, the term "artificial nature" indeed denotes an interstitial phenomenon, a boundary or perhaps even the point of an evolutionary decision' (Böhme, 1992: 196). This is the media-archaeological perspective of the trans-classical machine. According to Siegfried J. Schmidt



(1999), no form of culture can exist devoid of meaning, because culture itself creates meaning. But 'the secondary logic is neither the logic of nature, nor that of the subject.... It produces what it describes' (Holling and Kempin, 1989: 138). Culture has not only created epistemology, but indeed also signal-processing machines, which are then by definition detached from culture: they do not 'count' semantic aspects; they do not view images as icons; they do not perceive sound as music; and they read texts with the aesthetics of a scanner, by Optical Character Recognition (see Pias, 2013).

### **The Autonomization of Culture and History: The Micro-time of Technical Media**

The autonomization of technological processes of media temporality can be illustrated by the emancipation of mechanical time from astronomical time in the early modern age. Mechanical clocks were more than just that: due to the micro-mechanism of escapement they became oscillators, bringing the previously celestially oriented time down to earth (see Ernst, 2012). When the late scholasticist Nicolas d'Oresme compared the movements of the celestial bodies to the rhythms of the mechanical escapement device of a clock in *Le livre du ciel et du monde*, he modelled nature on technical mechanisms instead of modelling technology on organic archetypes. Since 'clockwork rhythms more appropriately define time units than the original rhythms of the heavens' (Taschner, 2005: 56), the mechanical media of time measurement dictate their non-discursive internal temporality to culture and turn the observer himself into their own medium. Galileo suggested that Christiaan Huygens should not use the human heartbeat, but rather mechanical oscillations to measure time. The end result is the atomic clock, which is based on the oscillations of a Caesium isotope. 'Atomic clocks are so precise that they are the ones defining chronological units now, rather than celestial phenomena' (Taschner, 2005: 56). This moment marks the emancipation of the media of measurement from nature within the medium of nature. If time is that which is measured with a clock (the Aristotelian definition of time), then that is media time. Yet the historical temporality of chronology and calendars is nothing but a scaled clock and thus becomes a function of the media of measurement. From this perspective, the category of media history is turned inside out: it becomes a temporal fold.

The autonomization of the technological media sphere from traditional cultural techniques becomes apparent in the detachment of *engineering* from classical *techné* during the Renaissance: 'The foremost achievement of engineers is the complete detachment of technical constructions from the model of nature and from organic modes of operation' (Krohn, 1976: 25). Mathematical instruments and clockwork mechanisms are no longer viewed as human organ extensions, but

rather as ‘organisms in their own right or, rather, machines whose operation is only guaranteed by their compliance with their own internal laws and rules that can be verified and controlled’ (Moscovici, 1969: 200) – a view that even extends to the algorithm as the literal *method*, the ordered progression, of the machine environment. Humanity perceives its own products as reality (McLuhan and Powers, 1989). This *other* reality is the object of a media-archaeological aesthetics. The intrinsic perspective (*Eigenblick*) and the intrinsic temporality (*Eigenzeit*) of media technology succeed, in their difference from human perception, in telling humanity something about itself. Since the advent of the mechanical clock, the temporal specificities of western society in particular must be analysed as a function of such techniques (Elias, 1991).

A central question for media studies concerns the manner in which the present organizes its knowledge around the media of the past. Its common model is called history; that is, the more or less linear progression of things and the narrative account of their development, their creation and their demise, regardless of how disjointed it may appear. Since the 19th century, historical discourse has borrowed the concept of time’s arrow from physical thermodynamics (the theorem of entropy). In contrast, media archaeology views the same collected materials and symbolic archives from a different perspective and chooses a different model to describe the past of media in concrete miniatures. At least temporarily, this kind of media archaeology shrugs off the supremacy of historical discourse, which – disguised as a history of science – tends to absorb all of its epistemological alternatives. The premature inclusion of the analysis of technological media processes in the category of cultural studies robs it of its explosive potential. Like the material-oriented *Kulturwissenschaft* and classical archaeology, media archaeology deals with artefacts, particularly with those that are created only in the process of technological execution; for instance, when a radio receives a broadcast. Regardless of whether this radio is an old or a recent model, the broadcast always takes place in the present. In contrast to media history – that is, the human vantage point (Vico) – media archaeology tentatively adopts the temporal perspective of the apparatus itself – the aesthetics of micro-temporal processes. A different kind of temporality is represented here. The oscillating string of an instrument still forces its sound – and with it its (intrinsic media) temporality – upon our ears. But these ears hear different harmonies in the same sound; they are culturally predetermined. A differentiation of the acoustic (physics), the sonic (cultural conditioning) and the musical (cultural semantics) is in order here. Does the vibrating string sound the history of being to us? Any discovery of string-based octaves always short-circuits historical time (Kittler, 2006: 282). This also means that the human senses not only conform to a seemingly immediate history of being, but also to the instrumental medium itself. These instruments are products of cultural techniques; that is, of a negentropic desire, such as the

repeated acoustic experiment. This, in turn, is inscribed with a 'historical' index (to paraphrase Walter Benjamin), which combines with our perception into a fulgurous constellation – media time, not history, is at work here. What is the relationship between the verisimilitude of a lab experiment and the contingency of discovery? The contingencies in the success of technical discoveries defy narrative logic. The relationship cannot be plausibly described within a classical causal model of history. Oerstedt came upon the effect of electromagnetic induction rather by accident, during a lecture in which the magnetic needle began to twitch in the vicinity of an electrified wire. Here, a micro-temporal process forms the foundation for a media-technological event and thus produces a new form of temporality in competition to the historical event. Sparks produce waves. Heinrich Hertz, a student of Helmholtz, realized accidentally that parallel to a spark, another one forms – a remote effect of electric beams. Hertz describes this phenomenon with the very theory of electromagnetic waves that Faraday and Maxwell contributed to epistemology. Maxwell arrived at the theory of light as electromagnetic waves through pure mathematics; heuristically, however, his very concrete starting point is the media channel of electromagnetic beams. The end point is fixed media – electromagnetic waves (radio): a realm with its own, no longer cultural, laws; media effects that literally exist between nature and culture.

Is the category of resonance between two temporal objects merely taken from acoustics as a metaphor or is it modelled on it directly? Resonance is produced when two tuning forks oscillate in perfect harmony. The vibrations of one fork – even if interrupted – cause the second one to vibrate as well – producing a kind of wireless information transfer (Küllmer, 1986). Does something similar occur in the actual reading of a 'historical' text? If it resonates in the moment of reading, it is no longer historical. Can the ear hear this type of oscillating event? 'What kind of reality is produced in the act of listening to a loudspeaker is a question of cognition' (Supper, 1997: 32). From the perspective of biological computing, Heinz von Foerster describes cognition – analogous to the neurobiological category of memory – as the 'calculation of reality'. Or, more precisely: cognition is the calculation of *one description* of reality (Foerster, cited by Supper, 1997: 32). This results in contractions of (cultural-)historical time.

### **How Not to Write Media History?**

Media time can be written as cultural history, but it is not identical to it. Media also demand another mode of representation of their occurrence in time – a fact which ex-historians understand, even if its positive formulation is for now nothing but a stammer. For cultural and media history, the pressing revolution of knowledge that unsettled the Newtonian world view around 1900, in the form of the physics of Max

Planck and Albert Einstein, is yet to come. When historiography is no longer viewed as the simple relationship between an object and its perception, but rather as mathematically mediated (statistics) and – in terms of a concise media archaeology – as a combination of measured object, measuring apparatus and perception, then historical time will be transformed into an observable in the sense of quantum physics. It is the act of registration (recording) that inscribes this time with a quality of irreversibility. The act of writing – that is, the transition between the continual flow of signals and their discrete recording – thus becomes comprehensible as a strictly media-archaeological moment, based not on its semantics, but on its operative execution. It is only this execution that produces the distinction between the past (factuality) and the future (potentiality). Michel Foucault's *Archaeology of Knowledge* questions statements on the level of their existence, their formation and the conditions of their possibility (the a priori, the archive). Media which do not merely refer to the axis of time (time-based media), but which are capable of manipulating it (time-critical media), represent a new type of temporal statement which media archaeology strives to account for. In contrast, for instance, to historiography and historical monuments, for which time is the object, technical discourse networks are capable of writing time itself. This intrinsic temporality demands another kind of temporal aesthetic – 'the temporality of ergodic art' (Aarseth, 1999). Espen Aarseth aptly proposes this perspective, but does not consider it in accordance with the stringent probability mathematics of Norbert Wiener (see Furtwängler, 2007). Media archaeology (as opposed to media historiography) constitutes an attempt to account for this alternate temporality of media. The linear prediction code – developed in the context of anti-aircraft defence and fire control during the Second World War, but used today as a probability indicator in all aspects of life – provides the model here. It represents the calculations that form the basis of Wiener's time-critical research. Herein lies an analogy to current micro-temporal economies – such as computer games – insofar as their operativity is equally as time-critical as it is (seemingly) infinite in its combinatorics. In essence, this question had already been raised by Leibniz in his fantasy 'Apokatastasis panton', an early version of Poincaré's return on the basis of the combinatorics of all letters in a library. The difference between this and the infinite but static space of 'The Library of Babel' (Jorge Luis Borges' short story from 1942) is the coupling of this thought experiment with media-operative and thus time-critical processes.

While it may not necessarily lead to writer's block, the engagement with time-critical media processes does entail a reluctance to write the modes of execution of media in time simply as media *history*. This provides a convenient model that can be practised with ease by trained scholars of the humanities, cultural studies and media studies. Still, an epistemological turn is taking place in this case as well – one that, in

terms of its ambiguity and uncertainty, can be compared to what quantum physics represented for classical mechanics. At the level of a technologically induced media temporality that can neither be written as cultural nor as media history, media time has long reigned on its own terms. Once more: written as history, media history and cultural history are connected. But wherever non-preconceivable media time processes are concerned – that is, processes which themselves subvert this historical model – the past of media must be written differently as well. It is not history, but at most the incidental nature of cultural existence as affected by the temporal modes of technology. To draw on a concept from Heidegger's 'Kehre' (turn), it is true that no historical existence (*Dasein*) could have invented the radio, but that – conversely – technological media, such as the radio, determine historical ways of being (*dazusein*). In contrast to Heidegger, however, media archaeology tentatively shrugs off the confines of the historical; not for the sake of a postmodern questioning of temporal processes as such, but in order to approach them from the vantage point of the media operations themselves, rather than allowing itself to be entrapped by musings on origins and metaphysics. Let us try for a moment to suspend the voluntary self-restriction of the human temporal horizon by means of the category of history. Thus, the face of the historical human being does not disappear like a figure drawn in sand at the edge of the sea, but rather like the sand in an hourglass.

*Translated by Guido Schenkel*

## Note

1. This article was previously published as 'Von der Mediengeschichte zur Zeitkritik' in *Kulturgeschichte als Mediengeschichte (oder vice versa?)*, Archiv für Mediengeschichte 6. Edited by Engell L, Siegert B and Vogl J. Weimar: Universitätsverlag, pp. 23–32.

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