Media Genealogy and the Politics of Archaeology

Introduction

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This introductory article offers theoretical and methodological demarcations for media genealogy, which operates in the work of each scholar interviewed for this special issue. We first examine the limitations of the media archaeological method in the work of Friedrich Kittler, Wolfgang Ernst, and Siegfried Zielinski. We later provide an outline of what media genealogy might look like, drawing on the work of our interviewees.

Keywords: media genealogy, media archaeology, problematization, Michel Foucault, German media studies

Media archaeology needs to be politicized. We suggest that the best and most obvious means for doing this is to attend to the distinction that Michel Foucault introduced between *archaeology*, the term that best describes his work from the 1960s, and *genealogy*, which best describes the work he began in the early 1970s. The key difference of this latter work was its investment in the analysis of power—or more specifically, technologies of power, technologies of governance, and technologies of the self. It is our goal to demonstrate that this difference *matters*, that it can inflect the entire body of media studies scholarship that follows Friedrich Kittler. Additionally, recognizing this distinction helps unite media studies scholarship with other historical investigations into scientific, technological, and cultural practices that are already highly attentive to concerns of power/knowledge and subjectification. Interest in Anglo-speaking countries of the overlapping arenas of German media theory, German media science, the work of Friedrich Kittler, media archaeology, and cultural techniques is clearly growing. Yet, just as clearly, the terminology and canon used to explain and give credence to this work differ widely. We would like to simultaneously muddy and clarify these waters by injecting a new term into the mix: *media genealogy*.

This Special Section devoted to media genealogy provides our overview as well as interviews with six scholars who we believe provide great insights into doing media genealogical work. This is not to suggest that any of them would consider media genealogy as descriptive of their own commitments. In

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fact, most of them do not hail from media or communication departments. We are not interested in branding them or providing them an academic home they are not in search of. Rather, we see the kind of work they do as suggestive of what we are calling a genealogical approach to media. Their work illustrates several dimensions of the project we outline. We originally invited them to be the featured speakers for the annual Communication, Rhetoric, and Digital Media Symposium held in April 2015 at North Carolina State University. Our title for the event was "Media, Epistemology, Power," and it was described in the promotional materials as an engagement with the political dimensions of media as epistemological machines. More broadly, the symposium was an attempt to create a dialogue about how to interject concerns regarding power into work that is increasingly being brought under the banner of media archaeology. In the following interviews, each scholar wrestles with major concerns relating to conducting historical and politically engaged media scholarship.

This introductory article offers theoretical and methodological demarcations of media genealogy. We begin by describing media archaeology as it has been introduced to English-language audiences. This version of media studies recognizes itself as being heavily indebted to Foucault's work, but generally restricts that commitment to his archaeological investigations of the 1960s. We suggest that media archaeology downplays Foucault's later writings and thus fails to heed Foucault's warnings about the limitations of the archaeological method. We then overview Foucault's own arguments about these limitations and his shift to the genealogical method. We also examine the work of three key German media theorists—Friedrich Kittler, Wolfgang Ernst, and Siegfried Zielinski—who are widely regarded as progenitors of media archaeology. We investigate each theorist's explanation of the archaeological method and the way in which he explicitly or implicitly draws upon genealogical analyses. Finally, we provide some examples of media genealogy, drawing on the work of the scholars interviewed for this special issue.

Media Archaeology

In Erkki Huhtamo and Jussi Parikka's edited collection *Media Archaeology: Approaches, Applications, and Implications*, which for many served as the first English-language aggregation of media studies scholarship operating under the banner of media archaeology, the editors describe Michel Foucault as "formative" for many media archaeologists and as the most prominent forerunner of "media-archaeological modes of cultural analysis" (Huhtamo & Parikka, 2011, p. 6). In fact, most scholars doing work that might be described as media archaeology are influenced by, directly cite, and work through the central concepts of Foucault (Ernst, 2013; Kittler, 1990, 1997, 1999, 2010; Parikka, 2012; Siegert, 1999, 2015; Winthrop-Young, 2002, 2011; Zielinski, 2006, 2013). Across the literature, it seems as if the archaeological component of media archaeology is always Foucauldian in its origins.

Jussi Parikka has done the most extensive work to aggregate media archaeological scholarship as well as to elaborate the theories and methodologies most typical to a media archaeological approach. Parikka (2012) argues that Foucault's influence is largely methodological and utilized for "excavating *conditions of existence*" for a given object (p. 6). He writes, "Archaeology here means digging into the background reasons why a certain object, statement, discourse or, for instance in our case, media apparatus or use habit is able to be born and be picked up and sustain itself in a cultural situation" (p. 6). In Parikka's most extensive treatment of Foucauldian methodology, he cites *The Archaeology of*

Knowledge (Foucault, 1972) exclusively, even paraphrasing what he understands to be the key methodological principles of the text.

This leads us to point out an opening for a further investigation into the potential value of media genealogy: First, archaeology as a practice specific to media could be more thoroughly accounted for in order to elaborate its limitations, and, second, a cursory review of the projects operating under the media archaeology banner demonstrates that they often overstep the methodological limitations of archaeology and begin to operate in a genealogical mode that is unfortunately under-recognized as such. We see these tendencies in Parikka's original work on the intersections of media and nature (2010, 2013, 2014, 2015). In his most recent book on geology and media materialism, Parikka (2015) attempts to construct "a creative intervention to the cultural history of the contemporary" (p. 4) by looking beyond the internal specifics of the machine, and instead taking machines as "vectors across the geopolitics of labor, resources, planetary excavations, energy production, natural processes from photosynthesis to mineralization, chemicals, and the aftereffects of electronic waste" (p. 139). As demonstrated later in our examination of the limitations to the archaeological method, this is a research agenda that seems genealogical through and through. We find the same tendency in Parikka's work on insects and bestial media archaeology, where he hopes "to look at the immanent conditions of possibility of the current insect theme in media design and theory" (2010, p. xiv), which would seem to imply critique by problematization, something we suggest is central to media genealogy.

Parikka (2015) explains, "Media archaeological methods have carved out complex, overlapping, multiscalar temporalities of the human world in terms of media cultural histories" (pp. 151–152). It is our contention that this is precisely what media archaeology *cannot* do without turning toward genealogical practice. Our critical attention on Parikka is not meant to detract from the original and important body of work he has brought to the world but instead to more prominently open up the field of Foucauldian-influenced media studies to the genealogical method, specifically through the notion of problematization. As the herald of post-Foucauldian German media studies in the English-speaking world, Parikka's work offers a convenient entry point into such an expansion and we call for an alignment of goals for future media studies scholarship. Toward that end, we hope to first demonstrate the limitations of Foucault's archaeology of knowledge and the reasoning behind his genealogical method. Then we will provide brief reviews of the work of three key theorists that Parikka and others have positioned as media archaeologist originators— Kittler, Ernst, Zielinski—and demonstrate how each of these scholars confronts the limits of archaeology. Last, we establish some of the possibilities that media genealogy and problematization offer to media studies scholarship and sketch out a media genealogical methodology.

The Limitations of the Archaeological Method

As Colin Koopman (2103) has elaborated at length, even in *The Archaeology of Knowledge* Foucault was hounded by a dissatisfaction with his own theorizations of historical continuity in archaeological analysis. At the time of writing, Foucault was already aware that he would be criticized for crudely affirming historical discontinuity. Foucault explicitly acknowledges that "Archaeology . . . seems to treat history only to freeze it," and later writes, "But, there is nothing one can do about it: several entities succeeding one another, a play of fixed images disappearing in turn, do not constitute either movement,

time, or history" (1972, pp. 166–167). He even closes the text by questioning the possibility of archaeologies other than those concerned with scientific epistemological practices, like sexuality, painting, and politics. For him, analyses that remained too structural in nature "can never take place but in the synchronic cross section cut out from this continuity of history subject to man's sovereignty" (Foucault, 1996a, p. 59). Foucault would soon come to believe that what all of his earlier works had failed to properly take into account was the problem of power, and he had failed to do so because the archaeological method had presented him with a diachronic snapshot of discursive rules, bracketing the need for an explanation of how they had emerged and endured across time. By 1970, Foucault would posit the addition of a genealogical method to archaeology to help account for this, the two of which were originally meant "to alternate, support, and complete each other" (1972, p. 234).[1] Here, as Hubert Dreyfus and Paul Rabinow (1983) are apt to point out, Foucault has begun to outline a methodology for articulating the non-discursive practices that effectively form a discourse.

Foucault's lecture series at the Collège de France from 1970 to 1971 signifies a key turning point and provides great insight into this shift. Michael Behrent (2012) suggests that Foucault turns toward the Greek sophists to accommodate his alternative to propositional knowledge (the outcome of archaeological method) with his interest in power. Foucault's reading of the sophists allows him to conceptualize power in terms of struggle rather than as something owned or that which is given through rights. Furthermore, power produces "truth effects—i.e. power-knowledge" (Behrent, 2012, p. 171). Finally, in Foucault's reading of the sophists, discourse is material. Statements exist in time and space and occur through a medium. As such, statements cannot refer to objects; they are themselves objects. The materiality of communication as well as the sensibility that power is best understood through an analysis of struggle will come to the fore in the work of Friedrich Kittler. In addition to the sophists, Foucault would repeatedly turn to Nietzsche as a means of elaborating genealogy.

As Foucault would elaborate in his essay "Nietzsche, Freud, Marx" (Foucault (1999a), the depth of archaeology is viewed from higher and higher up, producing a visible surface on which archaeological depth is laid out. It is on this surface that later, in his essay "Nietzsche, Genealogy, History," Foucault (1999b) would locate the "nonplace" at which adversarial wills would engage in the endless play of repeated dominations that leads to the *emergence* of forces. It is these emergent forces that would be responsible for the production, schematization, maintenance, inflection, and reproduction of the rules that constitute discursive regimes. As Foucault writes, "Rules are empty in themselves, violent and unfinalized; they are made to serve this or that, and can be bent to any purpose" (1999b, p. 378). Their formation through the play of forces is anonymous, prior to the distinction of subjects and objects. Foucault writes, "Consequently, no one is responsible for an emergence; no one can glory in it, since it always occurs in the interstice" (p. 377). At the level of the visible surface along which forces emerge and dominate one another, there are no identical points enduring across time, but the genealogist can isolate "substitutions, displacements, disguised conquests, and systematic reversals" (p. 378). It is here that the genealogist can recover history as series of interpretations and practices (see Foucault, 1999b, pp. 378–379) cutting across the temporal multiplicity of a field of forces (see Foucault, 1999c, p. 430).

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[1] For one of his first articulations of their difference, see Foucault (1972, p. 234).

By the time *Discipline and Punish* (Foucault, 1995) was published, Foucault's new theories had matured to a much more stable state. Here we can also see a fully formed outline of power/knowledge, wherein knowledge is no longer isolated and is instead always coupled to practices and power dynamics. It is this mutual inflection of power and knowledge that unfreezes time for Foucault, their intermingling having allowed for emergence in difference and repetition across temporal interstices. As Foucault (1995) notes, this ability to transverse the temporal axis in critique is not meant to better understand the past in terms of the present, but rather to produce *the history of the present*. As Dreyfus and Rabinow (1983) note, this new form of critique is able to locate the points at which "meticulous rituals of power" and "political technologies of the body" arose, took shape, and gained importance (p. 119). In so doing, Foucault finds a new way to offer up political opportunities to those who might seek them; his histories of the present delineate possible paths of attack, effects of truth ready for battle, in a struggle "waged by those who wish to wage it, in forms yet to be found and in organizations yet to be defined" (1996b, p. 262).

For Koopman (2013), problematization is the unifying thread that ties together archaeology and genealogy under the banner of providing critique in the form of a history of the present. For Foucault, problems emerge when a field of action, behavior, or practice becomes uncertain and unfamiliar or is set upon by difficulties imposed by (often non-discursive) elements surrounding it (e.g., social, economic, or political processes). Around this problem, a number of possible solutions or responses are posed simultaneously, and these possibilities are conditioned by, but are in no way isomorphic to, their surrounding elements. Foucault writes,

> This development of a given into a question, this transformation of a group of obstacles and difficulties into problems to which the diverse solutions will attempt to produce a response, this is what constitutes the point of problematization and the specific work of thought. (1996c, p. 421)

This notion of problematization, in conjunction with the concepts of temporal emergence and of power/knowledge produced by the cooperation of archaeology and genealogy, is the core of Foucauldian critique. Here "critique now becomes an inquiry into the conditions set by problematizations as they manifest in the contingent emergence of complex intersections of practice" (Koopman, 2013, p. 48). This mode of critique can track the play of forces, the contestations of power that have produced the space of possibility for contemporary practice. As Koopman (2013) notes,

> The point is not to discern how the intentions of those in the past effectively gave rise to the present, but rather to understand how various independently existing vectors of practice managed to contingently intersect in the past so as to give rise to the present. (p. 107)

In the realm of media studies and media history, the problematization approach has the capacity to not only (archaeologically) articulate the specific affordances and constraints of a technical media apparatus' functions of capture, processing, storage, and transmission but (genealogically) articulate the clashes of power that resulted as multiple technologies were (counter)posed as potential solutions within a

problematic field, and thus trace the emergence of a stabilized (socio)technical apparatus. Media problematization understood from a purely formalistic perspective would address what forms of noise in the system have been discovered/created that necessitate elimination. The historical specificity and centrality of media as constituting the means by which phenomena and elements of the world are approached as a problem space would be central. Thus, media technologies are more than the materiality of their machinic embodiments; rather, they are a method of systematically and repeatedly addressing a problem. Media address the certainty and regularity of signal processing, of reducing uncertainty and noise—or, in broader terms, "disciplining" signaling or, more consequently, epistemological practices. Media eliminate problems through the mastery of signal processing. Foucault's example for such practices comes from a French military manual that outlined a program for precise system control.

> From the master of discipline to him who is subjected to it the relation is one of signalization: it is a question not of understanding the injunction but of perceiving the signal and reacting to it immediately, according to a more or less artificial, prearranged code. Place the bodies in a little world of signals to each of which is attached a single, obligatory response. (Foucault, 1995, p. 166).

For Kittler, it is quite consequential that such an example has military origins.

Kittler, Ernst, Zielinski

For Friedrich Kittler, the invention of media technologies requires a discursive apparatus to produce the problematic that transforms sketches, technical plans, and theories into concrete inventions. For example, he argues that differentiating technical media based on the human sensory channels they correspond to is arbitrary, for there are only multimedia systems. Our capacity to differentiate them by such a correspondence only exists because "they were developed to strategically override the senses" (Kittler, 2010, p. 36). Technical media were developed in the 19th century as a consequence of psychological and physiological research on the human body, but the reason that they emerged in that century and no other—be it earlier or later—is because of the particular discourse networks they emerged within and the technical skills that had produced the human body as a scientific object, an *empirical body*, rather than a transcendental subject. As Kittler (2010) writes,

> After the individual sensory channels had been physiologically measured and technically replaced, what followed was the systematic creation of multimedia systems, which all media have since become. What emerged were simulations or virtual realities, as they are now called, which reach as many sensory channels as possible at the same time. (p. 163)

It is important to note here that, as Villiers de'Isle-Adam recognized over a century ago, the raw materials required to produce the phonograph were readily accessible throughout all of human history and could literally have been assembled at any time. Its construction was only rendered impossible by the lack of the appropriate discourse network (see Kittler, 1999).

Kittler (1999) writes, "Technical media are never the inventions of individual geniuses, but rather they are a chain of assemblages that are sometimes shot down and that sometimes crystallize" (p. 153). Further, "Because a human life is far too short to comprehend avalanches of technical innovations, teamwork and feedback loops become essential" (p. 157). This is akin to McLuhan's (2003) argument that humans are but "the sex organs of the machine world, like the bee of the plant world, enabling it to fecundate and to evolve ever new forms" (pp. 68–69). McLuhan argues, "One of the most common causes of breaks in any system is the cross-fertilization with another system" (p. 59). On this point, Kittler agrees: "One must . . . consider developmental teams, subsequent developments, optimizations and improvements, altered functions of individual devices, and so on; this means, in the end, an entire history of the industry" (1999, p. 34).

Let's return for a moment to Kittler's argument at the point where technical media are no longer differentiable based on the human sensorium. At that point, technical media render the human central nervous system superfluous to mediation (Kittler, 1999). The human is lost into the apparatus, and the so-called human is split into physiology and information technology. At this point it is clear that Kittler is moving past the archaeological method. His work is concerned to trace the emergence of particular technical media, and it does so in relation to the play of forces forming discursive rules, governmentality, strategies of producing bodies, and technologies of the self that operate under the regimes of physiology, anatomy, and psychometrics—particularly in relation to military endeavors. Technical media arise out of distributed discursive networks composed of bodies of knowledge (such as chemistry and physiology), objects of knowledge (such as precise chemical components), distributed human research and development teams, techniques and technologies of governmentality and the self, as well as recombinations of technological apparatuses. After crystallizing, technical media quickly cut their roots and become mobile, intermixing and recombining with one another, to the point where their original frame of reference holds explanatory power for their functioning.

In large part, Kittler's analyses are indeed archaeological in nature. He is often focused on demonstrating exactly how particular technologies function in relation to the "so-called human"—or, as Kittler terms it, how they escape the grid of the symbolic. These analyses are of specific inventions leading up to and including phonographs that digitally capture the real, or photo- and cinematographic devices that digitally capture the imaginary. And while any given device's technological functioning—in terms of things such as component arrays, wiring, hardware, and programming—cannot be explained by their original frames of reference, *their emergence can*. While Kittler does trace specific technologies out of joint with any linear technological history, he is also invested in analyzing their disjointed emergence across the interstices of multiple temporalities. He does so by producing numerous overlapping genealogies, as in his work on optical media, which traces a lineage from the camera obscura to photography to cinema to television, which affords him theories of optical mediation as a set of non-discursive practices and techniques. These crystallize into variable media technologies and, we suggest, operate as modes of subjectivation under what Foucault came to call governmentality in the late 1970s. It is here that we note a particularly productive line of inquiry into the relationship between media archaeology and governmentality has largely been overlooked.

In his earliest work, Kittler (1990) describes his project as an analysis of "the network of technologies and institutions that allow a given culture to select, store and process relevant data" (p. 369). We would like to highlight these aspects, at times neglected, of Kittler's work. Although many view the termination of Kittler's history to be the obsolescence of the human in a world of digital computers and near autopoietic machines, we might take as a clue the sparse amount of his work that actually elaborates that world. Instead, one might see Kittler as diagramming a particular problematization in the contemporary, an arbitrary and contingent set of possibilities for the future in our *current* discourse. Despite the emphasis he places on it, the world Kittler imagines never arrives in his work in any teleological sense. If we take that to be true, it is easy to envision Kittler as writing a history of the present, with an eye to one possible future that has not yet arrived, so that we might alter any of the multiple strategies and tactics plotting our course. Parikka (2012) seems to agree that, in Kittler, at the birthplace of media archaeology, his two key insights—media as "systems for transmitting, linking and institutionalizing information" and the functioning of power in an age of technical media—are the result of a combination of both archaeological and genealogical methods (p. 68). Perhaps this is why Kittler eschewed his supposed affiliation with media archaeology (Huhtamo & Parikka, 2011, p. 9).

Geoffrey Winthrop-Young (2002) provides another reading of Kittler's methodological commitments.

> German media scientists such as Kittler evolved their own link between archeology and genealogy; that is, they fused war to its discursive effects by examining the mechanisms and technologies of inscription, physical disciplining, and surveillance that connect the two. (pp. 845–846)

He suggests that Kittler developed his "war answer" or "martial a priori" as a means for overcoming the perceived limitations of archaeological analysis in providing an explanation for why one episteme replaces another (see Winthrop-Young, 2002, p. 845). He nicely sums up such an explanation: "War serves as the prime techno-historical catalyst and hence as the explanatory backdrop of media evolution; media evolution, in turn, explains epistemological patterns and ruptures" (p. 845). Winthrop-Young sees three other plausible means for addressing archaeology's limitations. First, Paul Virilio develops a historical argument that the military necessity for speed and accuracy demands technological replacements for the human. Second, Keith Hoskins specifies the disciplinary mechanism attached to new forms of "learning to learn" by which humans automate and mechanize the learning process. Third, James Beniger argues that a series of "control revolutions" have taken place in civilian arenas that demanded the programmability of the human to coordinate with machines. What we ultimately find in Winthrop-Young's examination are other prevalent genealogical explanations. What we hope to add to such a description are some means for generalizing these kinds of explanations into methodological coherence.

Wolfgang Ernst's understanding of media archaeology is derived from an extended investigation of archives and library science. His work can largely be situated in the post-1960 response to the grand narratives of historiography that looked to characterize an epoch through investigations into stable identities such as the nation or state, often by totalizing archival data on groups of individual citizens meant to constitute its population. In particular, Ernst couples German media theory with work on new

historicism in the United States by the likes of Stephen Greenblatt and Hayden White as well as French poststructural theorists such as Foucault, Gilles Deleuze, and Jacques Derrida. For Ernst (2015), Foucault left open the variable of media and mediation, and thus missed the ways in which the surface or interface of the archive is underlain by operative agencies that establish an inherent order to things in their very (archival) production.

For Ernst, a genuine media archaeology historicizes the concept of the archive itself by examining it as the law of the sayable and the seeable. Rather than imagining away the gaps and silences of the archive, it uses them to establish a model by looking for patterns in the data and examining "the figuration of their registrative texture" (Ernst, 2015, p. 74). This is made difficult in the case of technical media, because they constitute a *dynamic archive*; they form series of data, rather than stories, according to cultural-technical operations that can dynamically rearrange them into different information. In a digital archive, "past, present, and future are nothing but segments, functional demarcations of differences in a dynamic data stream" (Ernst, 2015, p. 94), and thus historiography is unable to operate. Ernst argues that only an archaeological method can reckon with data.

Archaeology can do this by a sort of reverse engineering, by looking at the information configured out of the data to establish the law of the sayable and the seeable within the archive, which also requires an acceptance that media themselves are also archaeologists (Ernst, 2013). Media are made up of techno-epistemological configurations that always precede the discursive surface of the archive that humans engage with. The root of media archaeology is not in historicizing particular inventions but in establishing their *arché*, their laws of the sayable and seeable, immanent to their very source code. For Ernst, this means that media archaeologists need to be competent in informatics, know the infrastructure of the technologies they critique, and perform media archaeology by using those same technologies. He writes "Media theories work only when being tested against hard(ware) evidence" (Ernst, 2013 , p. 60). This is because media archaeology deals with the structural level of hardware and not its history.

For Ernst, none of this is to the detriment of cultural studies. Instead, media archaeology operates as a sibling field, paradoxically opening cultural studies to the "noncultural dimensions of the technological regime" (2013, p. 61), because currently "the machine is the better media archaeologist of culture" (p. 62). He writes, "Media-archaeological analysis opens culture to noncultural insights without sacrificing the specific wonders and beauties of culture itself" (p. 62), and, "Media archaeology exposes the technicality of media not to reduce culture to technology but to reveal the techno-epistemological momentum in culture itself" (pp. 72–73). But there is a readily apparent problem here in that this is a unidirectional causal mechanism rather than a feedback loop. Ernst maintains that studying the interrelations between the two necessitates keeping them separate to rethink their terms and practices, and he argues that media archaeology ought to uncover the external technological laws that are the primary agents of media history. Yet he has an obvious trajectory by which these investigations can inform cultural studies but little to say about what influence cultural studies might have on media studies in this interrelationship.

Ernst opened his career with a book that saw archives as enmeshing power and having internal politics (2015), even in their digital and dynamic manifestations. He saw the archive operating in league

with power to generate an order of things, forms of literature and knowledge. The texts contained in the archive are "monuments to power that have coagulated into writing" (p. 53), but what are *data*? Ernst seems eerily silent on the play of forces and the operation of power in the production/collection, processing, storage, and transmission of data. Ernst writes, "Power is *what* remembers, rather than *who*, as we have learned from Foucault" (p. 53). In the instance of a digital and dynamic archive, one that by necessity contains at least database and parsing algorithm but likely also peripherals for preparing/producing data for input and for output via an interface, where does power lie? Is it solely with technical and mathematical laws for signal processing? Are there no options or variations among archival technologies that get embedded through infrastructural sociotechnical processes? These (genealogical) questions are few and far between in Ernst, and it is precisely they that would benefit from a feedback loop between strict archaeological investigation and genealogy, be it a cultural studies variant or not.

Parikka acknowledges that "this archaeology starts to think through our mediatic world as the conditions for the way in which we know things and do them—knowledge and power" (Ernst, 2013, p. 6), and notes that Ernst leaves open the possibility for media genealogy but continually describes genealogy as the (political) narration of counterhistories (Ernst, 2013; Parikka, 2011). Parikka also seems well aware of the potential critique of Ernst in terms of the absence of the political in his theories, but he praises Ernst's development of nonsubjective approaches to the study of media, for Ernst's "cold gaze," which allows him to examine technology at the level of signal processing and develop theories of microtemporality and time criticality. However, Parikka also argues that Ernst's call for fostering media competency through education might be sufficient to transform his archaeological work into a history of the present à la Foucault. We would like to push the question of how people working on the interrelationship of media and culture might create a feedback loop between the two rather than leaving the relationship unidirectional, as Ernst does. Further, we are unclear on how to leverage Ernst's media archaeology to critique contemporary or future technologies that are increasingly black-boxed and unavailable for reverse engineering and technical tinkering.[2]

Siegfried Zielinski (1996) was perhaps the earliest scholar to popularize the term *media archaeology*, arguing early on that from a pragmatic perspective it meant "to dig out secret paths in history, which might help us to find our way into the future" (para. 9). At the time *Audiovisions: Cinema and Television as Entr'actes in History* was published, Zielinski (1999) was already focused on the triad formed of technology, culture, and subject. There he expressed an interest in utilizing the work of British cultural studies, and Raymond Williams in particular, alongside more traditional German media theory; he also worked to distance himself from competition with other German media theory focusing more exclusively on "the techno-structure of media processes (like, for example, those of Friedrich Kittler and his pupils)" (1999, p. 21), to which he instead understood his work to be supplemental. While *Audiovisions* certainly focused on technological apparatuses, it consistently framed them within a particular context of cultural forms and viewing subjects.

Zielinski articulated an anarchical tendency in certain "artists, theoreticians, and artist-theoreticians" to

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[2] Parikka raises these issues, but has little to say about them (Ernst, 2013).

burn and burn up in the endeavour to push out as far as possible the limits of what language and machines, as the primary instances of structure and order for the last few centuries, are able to express and in doing so to actually reveal these limits. (1996, para. 4)

This took center stage in his later book, *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means*, where Zielinski (2006) began to reposition archaeology as (an)archaeology. This new articulation of media (an)archaeology was meant to escape the grand genealogical narratives of master media and instead focus on isolating discrete instances of events, ideas, and objects in the past where the grand narratives were still in flux, and often ones that contradicted those narratives. Zielinski wrote: "The goal is to uncover dynamic moments in the media-archaeological record that abound and revel in heterogeneity and, in this way, to enter into a relationship of tension with various present-day moments, relativize them, and render them more decisive" (2006, p. 11). Drawing on Foucault, Zielinski was interested in isolating divergent and disjunctive concrete specificities in a framework that resisted any attempt to totalize them into a narrative of linear progression, one that would instead maintain the tension of the in-between of its heterogeneous phenomena, of concepts and reality, of calculation and imagination. This was not to be taken as a philosophical study but as "a collection of curiosities" (Zielinski, 2006, p. 34).

Zielinski described this collecting of curiosities as forming "a *variantology* of the media" (2006, p. 7), a project that he would extend across five edited volumes of curiosities before publishing his next monograph. In his most recent work, *[. . . After the Media]*, Zielinski (2013) seems to have come full circle, referring to his own project as a genealogy and calling for others to produce "comparable thematic genealogies" as well. His (an)archaeological investigations of specific media curiosities persist, belonging to "resistant particularities" and "free-floating singularities," but "they can also get dragged into the machinery of the systemic and thus also take on or be assigned a strategic character" (p. 24). This latter aspect is a new focus in Zielinski's work, and it demonstrates how (an)archaeologically excavated media must also be understood in terms of how embedded they are in overarching apparatuses, foremost of which are Foucault's notions of truth, knowledge, and sexuality. On this, Zielinski (2013) writes:

> *The media* have the character of a *dispositif* in the sense introduced by Michel Foucault.
> . . . Their objectivations belong to the resources of knowledge and manifestation that
> structure power. *The media* are significantly involved in producing the cultural self, as
> well as co-constituting the sanctioned notions of the Other. (p. 24)

Zielinski's work can here be seen to come back to the grand genealogical narratives from which he departed by way of archaeology and (an)archaeology. Without the complementarity of these two methodologies, Zielinski is powerless to address what in *[. . . After the Media]* has become a central problem for him: a history of the present capable of addressing the most pressing of our current political dilemmas in a productive manner.

Parikka (2011, 2012) has focused on the genealogical production of "counter-histories" that trace the emergence of neglected and minor traits in history. This is an understanding that may account in part

for Zielinski's initial divergence from media archaeology to (an)archaeology and variantology, but it doesn't directly account for problematization, nor for Zielinski's more recent work. Genealogy is foremost a methodology for producing a history of the present, in which the role of the counter-, the minor, and the neglected is to establish the emergence of a particular apparatus and problematization delimiting the present and establishing the grounds of possibility for practice and utterance. Genealogy analyzes the play of power from which historical moments emerge in their disjuncture, and rather than negating archaeological analyses, it lends them their contemporary stakes and significance. It is precisely for these reasons that in a text where Zielinski feels compelled to answer for media in the contemporary, he turns to genealogy.

What Would Media Genealogy Look Like?

In his first extended work, Kittler (1990) described the object of his analysis as an apparatus composed of networks of technologies and institutions that operate at the level of culture by facilitating data collection, processing, storage, and transmission. In our opinion, Kittler's (often implicit) methodologies are still perhaps the most robust and effective tools for performing media studies in terms of both archaeology and genealogy. For Kittler, technical media emerge piecemeal from a historically conditioned discourse network, combining, mixing, cross-pollinating, and eventually crystallizing, all while gaining an increasing autonomy from the milieu in which they originated. A Kittlerian must examine corporations, militaries, bureaucracies, nonprofit organizations, academies, inventors and development teams, and potentially spatially and temporally distributed contributions in the form of tweakings, developments, optimizations, alterations of functions, combinations, ad infinitum. This is perhaps the best example of an investigation that responds to the call to navigate between technological determinism and symptomatic technology, the Scylla and Charybdis of media studies.

Jeremy Packer (2010, 2013) described media as encompassing a much broader range of technologies, all of which served to articulate and link things together in networks of forces, practices, knowledge, and institutions. It was in this sense that even infrastructures were always already media and that media studies was required to take in a wide-ranging set of discursive and non-discursive utterances, statements, and grammars of architectures, diagrams, and backup plans that all work to hold together a given, and sometimes fragile, apparatus. We would like to expand this definition in response to our analysis of Kittler's work, and articulate media as tools of governance that shape knowledge and produce and sustain power relations while simultaneously forming their attendant subjects. Media technologies are precisely those that allow for the extension of culture across time, for culture's duration and endurance. As such, they have a priori stakes in the realms of the political, the ethical, and the epistemological. Media collect, store, process, and transmit data that are variously used to rate, coordinate, create, obfuscate, obliterate, translate, demonstrate, and even create virtuality, materiality, and reality itself. Yet we can see this rise as immanent to governance as it has taken shape across the globe in unevenly dispersed fits and starts over the past several thousand years.

What was already in embryo in Kittler's work, and has subsequently gone underdeveloped as German media studies turned toward developing a media archaeological method, was an explicit analysis of the visible surface of contesting forces and power relations on which archaeological depth is laid out. In

his definition of discourse networks, Kittler was already close to a notion of problematization that could investigate the fundamental role that media technologies play in determining the conditions of possibility, existence, and truth that articulate and define both subjects and objects in a given culture. Media archaeology's interest in the concrete specificity of an individual technology can miss its larger role in the production and maintenance of a larger apparatus, even though that technology's spatial and temporal location in such an apparatus is immanent to that very technology in its concrete specificity.

This idea is well demonstrated in the work of Paul Edwards (1996), for whom any tool or technology and our understanding of it are linked through discourse.

> (A) self-elaborating "heterogeneous ensemble" that combines techniques and technologies, metaphors, language, practices, and fragments of other discourses around a support or supports. It produces both power and knowledge: individual and institutional behavior, facts, logic, and the authority that reinforces it. It does this in part by continually maintaining and elaborating "supports," developing what amounts to a discursive infrastructure. (p. 40)

Any analysis of technology requires an examination of the discourse through which that technology has been produced as an object of knowledge for thought. We have to understand the infrastructure of which it is a part if we want an accurate technical articulation of the object itself. For Edwards (2010), this is to be accomplished through "infrastructural inversion."

Infrastructures often begin with large technical systems that go through a process of "invention, development and innovation, technology transfer, growth, and competition, consolidation, splintering or fragmentation, [and] decline" (Edwards, 2010, p. 10). As they consolidate, "gateway" technologies emerge that allow heterogeneous and incompatible systems to interoperate. These gateways allow standardized systems to merge into much larger networks that are much more flexible and robust but require a replacement of top-down control with horizontal or distributed coordination processes. Further, even these networks become limited, and eventually the demand for increased functionality produces gateways between networks to form "Internetworks" or "*webs*." As Edwards notes,

> In general *infrastructures are not systems* but networks or webs. This means that, although infrastructures can be coordinated or regulated to some degree, it is difficult or impossible to design or manage them, in the sense of imposing (from above) a single vision, practice, or plan). (2010, p. 12, emphasis in original)

It is at this point that the scope of investigation for the crystallization of a single technology becomes unmanageable. For instance, to examine the emergence of even the simplest electronic computers, one would need to consult, among other things, Hughes' (1993) monumental history of electrification in the United States and the emergence of electrical grids as infrastructure. Then one would need to consult the gateways by which that electricity was able to move from the grid into the computer and through its circuits to activate the hardware. And this is for a computer that has no software, interface, or Internet. As such, the analysis must always be in some sense iterative and limited. Like

Kittler, we might produce a forever-delayed end point of investigation to pursue piecemeal and modify on the fly. In the interview of Paul N. Edwards by Alexander Monea titled "An Archive for the Future: Paul N. Edwards on Technology, Historiography, Self and World," Edwards discusses these issues of methodology and interdisciplinarity in media studies, as well as the political stakes of historiographic inquiry in terms of media and technology.

Much scholarship has been generated that takes a similar approach to media studies—a good portion of which is represented by the work of the scholars interviewed here. Peter Galison (2003) has studied the standardization of time through telegraph cables, clocks, and maps, and with Lorraine Daston, has studied the emergence of scientific objectivity through various scientific instruments (Daston & Galison, 2007). Two genealogical insights arise from this scholarship that are directly relevant here. First, Galison situates the "discovery" of relativity at the nexus of a geopolitical struggle to own and manage space and time. Simultaneity was a problematic first and foremost of governance, which necessitated a techno-scientific apparatus to solve. Second, processes of subjectification are deeply rooted in media-specific modes of social and scientific forms of observation or data collection (Daston & Galison, 2007). Objectivity is an ethical mode of self-relation as well as an epistemological commitment. As such, media are epistemological machines for sure, but they are also governmental machines and subjectification machines. In the interview of Peter Galison by Jeremy Packer, "Abstract Materialism: Peter Galison Discusses Foucault, Kittler, and the History of Science and Technology," Galison adds complexity to this relationship between technology and the self. Using the Rorschach test as an example, he suggests there is an almost dialectical relationship between the self and technology whereby specific formations of the self determine the very possibility for developing new technologies (2016).

Orit Halpern (2012a, 2012b, 2015) extends this methodology in her analyses of cybernetics, aesthetics, and human perception by analyzing "demos," the technological prototypes that play a role in the emergence and crystallization of media technologies. Her work locates "a mid-century reconfiguration of cognition, perception, and sense that continues to underpin our relationship to the screen, the mind, and the body in the present" (Halpern, 2012b, p. 330), and it is this shift that much of her work is dedicated to producing a genealogy for. Halpern encourages us to ask what the concepts we use to describe media actually denote in practice; how their specific tactics, methods, and strategies render the phenomenal and empirical world measurable and modifiable; and what their specific subject-object schemas are outside of the grand narratives by which they are usually conceived. Demos are one such way of asking and answering these questions, because they outline the problematic field from which specific technologies arise. And her work on perception and vision traces "a genealogy of our contemporary discourses that waver between augmentation and simulation, and between reactionary imaginaries of biologically determined subjects and emergent ideals of infinitely modulatable bodies" (Halpern, 2012a, p. 233). In the interview of Orit Halpern by Eddie Lohmeyer titled "Cinema/Cybernetics/Visuality: A Conversation with Orit Halpern," Halpern discusses the challenges of writing histories of big data through the concepts of vision and the demo, as well as the possibilities that such historical methods have for advancing media criticism and practice.

Media genealogy from this vantage is an investigation into the media a priori of problem formation. It would examine how media allowed certain problems to come to light, be investigated, and

chosen for elimination and how media aided in the various solutions that have been enacted. For instance, in recent work, Chris Russill (2013) has examined the means by which ultraviolet light and the ozone layer came to be "seen," measured, and represented via computational modeling. This opened up the potential to problematize ozone depletion as a hole and not merely as a number representing the percentage of ozone present at different levels of the earth's atmosphere. The infamous hole in the ozone was a media problem from the ground up—without media to collect, store, process, and circulate data, there would be no ozone hole. Media in this case were used in mustering support for what has largely been the successful set of policies enacted to reduce emissions of chlorofluorocarbons. In the interview of Chris Russill by Kate Maddalena titled "Is the Earth an Optical Medium? An Interview with Chris Russill," Russill describes his unique combination of media and cultural studies that he leverages to critique the technical media apparatuses of earth systems sciences, with a specific eye to its capacity to map the power relations in discourse on ozone holes, climate change, the photosynthetic machines of science fiction, and sunscreen.

Lori Emerson's work is perhaps the most archaeological of our interviewees, yet a large portion of it contains the seeds of genealogical research. Her Media Archaeology Lab has a huge collection of old (often "dead") technologies that are kept functioning so that people can continue to interact with them. Yet the Media Archaeology Lab's motto is "the past must be lived so that the present can be seen" (Media Archaeology Lab, n.d.), a linkage that cannot be formed without the genealogical method, and also one that seems similar to Foucault's desire to provide a history of the present. Emerson also describes her continued work on the infrastructure of the Internet as an effort to articulate "how we are unwittingly living out the legacy of the power/knowledge structures that produced TCP/IP" (Emerson, 2015, para. 2). Emerson's (2014) *Reading Writing Interfaces* similarly traces the history of reading/writing practices through a series of (technical and technological) interfaces between subjects (readers and writers) and objects (texts and their contents). Her book is a wonderful example of the utility of the archaeological method, but its ties to large-scale shifts in reading/writing practices can also be read as genealogical. In the interview of Lori Emerson by Jay Kirby titled "As If, or, Using Media Archaeology to Reimagine Past, Present, and Future: An Interview with Lori Emerson," Emerson describes her methods through the lens of the Media Archaeology Lab, which collects still-functioning media artifacts to demonstrate the different possibilities of what is and what could be in terms of digital and analogy media technologies.

Mark Andrejevic provided one of the clearest and earliest examples from North America of a genealogical investigation into the historical workings of media power. In the "Work of Being Watched," Andrejevic (2002), outlined the necessity for reemphasizing the productive capacity of surveillance, following from Foucault, to understand the historical relationship that developed between Taylorism, the media specificity of time-motion studies, and the rationalization of the production process. Extending Dallas Smythe's (1977) classic notion that watching TV is work, Andrejevic suggested that being watched, being under surveillance, is the form of labor done by consumers that exposes them to the rationalization of the consumption process. Digital interactivity produces firmly grounded power relations whose historical continuity is driven by the productive capacity of surveillance to create new efficiencies grounded in the epistemological capacities of media technologies to collect, store, and process data. In the interview of Mark Andrejevic by J. J. Sylvia IV titled "The Future of Critique: Mark Andrejevic on Power/Knowledge and the Big Data-Driven Decline of Symbolic Efficiency," Andrejevic discusses theoretical critique and the

importance of power for any theoretical framework for the study of media technologies, and outlines his work to reimagine the relation of power and knowledge after the decline of symbolic efficiency.

It is worth reiterating here that our extended engagement with media archaeology's methods is not meant to discourage scholars from continuing to perform archaeological investigations of media and technologies. Instead, we have tried to demonstrate how that methodological commitment leads outside of itself, that at some point it requires a genealogical component, which, when added, lends media studies a relevance and urgency it might not otherwise have. We are also of the opinion that opening media archaeology up to genealogical commitments—notably power and subjectivation—allows media studies to better interface with hugely significant and often overlapping investigations from other disciplines of media, science, governance, and technology. In the following interviews, you will see how six scholars invested in these debates understand some of these limitations, commitments, and interdisciplinary considerations.

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