Introduction: What is hands on media history?

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A relationship with technology is central to being human, but it is not well understood. Humans create technology and have done since the earliest times, and this is commonly taken as a sign of what distinguishes humanity from the sub-primates. Equally, though, our technologies create us, enabling the activities and experiences and forms of social organisation that make us who we are. This intimate imbrication of technologies in the formation of human bodies, minds and structures of feeling is less well appreciated. To understand fully this reciprocal relationship between humanity and its technology is becoming an ever more urgent task. The world that we experience is one where technology seems to be taking control (which is not necessarily a new perception of human life), but also a world where the affordances of our technologies are having a detrimental effect on the planet we inhabit (which is a new and urgent perception). Hands on history is a central method in the overdue rethinking of the reciprocal relationship between humanity and the technologies it creates.

The hands on approach validates physical encounters and revalues 'skills' as the basis of the generation of knowledge and thought, as Ellis argues in his contribution to this collection. Hands on history techniques involve various forms of physical exploration of technologies as means of understanding how technologies have changed, and how they have changed us. History provides a distance, a 'making strange' (Shklovsky 1991) which, in this case, makes it much easier to reflect upon how our bodies relate to technologies and how we have taken for granted views about the use of technologies. Humans habitually adapt themselves

physically and mentally to their technologies. Almost all technologies have affordances which remain unexploited. It is difficult to perceive these two features of our relationship with our everyday technologies. An encounter with the technologies of the past, once equally familiar but now fallen into disuse, will more readily reveal the double sided relationship between machines and people, bodies and tools, perceptions and potentials.

It may seem strange to make this argument at a point when so much technology is disappearing into black boxes or into the virtuality of data. However, it is exactly this development that gives urgency to the task of understanding the nature of the relationship between humans and technologies. Traditionally, we have conceptualized communication, as John Durham Peters (1999) has explored so eloquently, as the attempt to externalize the mind's thoughts through a process of dissemination which is always less than ideal, but equally enables us to exist as humans. However, we are now embarking on a phase of existence where communication is involuntary, where our every physical movement "sheds" data through our own everyday communication devices (and the routine devices of public surveillance) which can then be recuperated and processed. This involuntary communication has become meaningful through the deployment of the new range of computational technologies. The old saying "What we do speaks volumes" has now become literal fact because it can be collected, measured, compared, and processed. So it seems to us as though we are developing a new relationship with technology, the like of which we have not experienced before. The value of the hands on history approach lies in enabling researchers to see this rather more as another chapter in the long relationship between human bodies and technologies.

The hands on approach also emphasizes the issue of technological affordances. We may shed data as a fact of modern life, but the uses to which this data is put, and what the machines are that learn from it, is increasingly concentrated in a narrow range of the affordances of this new technological dispensation. As Zuboff (2019) persuasively argues, the whole of our being (including the evanescence of moods and the confidentiality of the personal) is now subject to collection, processing, deduction, and - crucially - marketisation. This marketisation takes the form not only of predicting future behavior but also of channeling it through the further processing of the data which returns to us. This is a particular use of the affordances of the new data-driven technology. It is not the only use, as even Google was once keen on telling its customers. A few years ago, Google's ever optimistic public presentations promoted 'artificial intelligence' (AI) as it was then known as the universal panacea. The standard presentation example was that of the prediction of flu epidemics from the search patterns of individuals looking for 'cold and flu remedies' and similar terms. This remains a rather lonely example of the use of AI in public service rather than at the service of regulation and commercial exploitation.

Hands on history defamiliarizes our relationship with technologies. As a novel approach, it allows us explore what we understand but do not know that we know. It allows us to reassess our culture in terms of its physical encounters with its tools and technologies, and to use this understanding for further reflection. As Ellis argues, hands on history takes a number of complementary forms, all of which are explored in this volume. Hands on history provides a framework in which we can obtain and explore a machine for its affordances, experiment with combinations of machines to discover how they work together and what they might be capable of achieving, and discover and document the communities that have developed advanced skills in combination with the machines within defined historical contexts. This

framework offers further opportunities: we can document the ensembles of machinery, the technical arrays and the working practices into which they are or were inserted. We can experiment with using, or getting professionals to use, those technical arrays in the way that they were once used, and enhance our understanding of both the affordances of the machines and the affordances of their host institutions or work-places.

Hands on history is already a flourishing practice in museum display, primarily aimed at the engagement of children and families. It promotes the physical exploration of objects liberated from their display cases. This encourages curiosity, tactile engagement and exploration that leads, hopefully, to further learning. Academic researchers are increasingly turning to hands on history practices as well, often in response to digitization and technological changes. The term 'hands on' is often used to describe the physical engagement with archival documents, rather than their digital avatars. These approaches are based on two assumptions:

- The assumption of authenticity, that the physical objects have properties that can hardly be reproduced in other media.
- The assumption that physical interactions with objects produce forms of knowledge that cannot easily be translated into concepts.

The knowledge gained from hands on activities is a necessary, but often under-rated, aspect of learning. Roger Kneebone, professor of surgical education at Imperial College London, argues that "the ability to do things with your hands, with tools, cutting things out and putting things together […] is really important in order to do the right thing either with operations, or with experiments." He is concerned that "We have noticed that medical students and trainee surgeons often don't seem as comfortable with doing things with their hands [as] they used to, even perhaps five or ten years ago." (Weaver 2018). Kneebone ascribes this decline in physical skills to the increased engagement with screen-based activities.

The emphasis on tactile learning is important for understanding the past as well as for preparing to encounter the future. To work with authentic historical documents and objects is to develop an empathy with the people and practices for whom those objects were of central importance in either everyday or especially significant practices. Often, the regular users of these historic objects developed specific physical skills in using them. Kneebone has developed simulations of past medical practices, bringing together retired surgeons who carry out operations on realistic silicone models to demonstrate techniques that have since fallen into disuse. A similar approach was been adopted by the ADAPT research project examined here by Ellis, Hall and Murphy. In Kneebone's simulations, the surgeons are often assisted by current medical students (Kneebone & Woods 2012), and the whole activity is filmed "to capture the unspoken context of the contributions of assistants, scrub nurses, anaesthetists and other members of the surgical team" which are often ignored in existing written and even filmed accounts (ibid). Hands on history concentrates on the physical interactions which are often overlooked or downgraded in intellectual practice as 'mere skills', as Ellis's chapter emphasizes. As a result, a hands on approach often reveals the work of subaltern groups and individuals: the assistants, the artisans, the technical staff.

Hands on history involves a range of practices from the informal to the highly elaborate. They are united by the perception that the material world cannot be fully understood without physical encounters, and that, further, practices in the material world are poorly documented or misunderstood. Within this movement, hands on media history is a relatively new branch. It has been conceived at a time when the taken-for-granted practices of the analogue media era are disappearing into the past, leaving behind a substantial legacy of obsolete equipment whose use quickly became obscure. The existence of these puzzling artefacts has produced a media archaeology movement. An essential corrective to the predominant historical myth of

perpetual innovation and improvement in media (a tendency identified by Fickers and van den Oever in this volume) this movement examines forgotten or 'dead' media as Bruce Sterling (1995) defined it, often through a direct physical engagement with pieces of technology. The work of Siegfried Zielinski and Wolfgang Ernst has been formative for this movement. Zielinski's larger historical project of 'variantology' involves an archaeological approach to media technologies, as well as writing extensively on time-based media and media history (Zielinski & Wagnermaier 2005). Around 2013, Ernst founded a pioneering collection of working examples of obsolete media technologies at Humboldt University, the Medienarchäologischer Fundus (Media Archaeology Resource). This initiative has been the inspiration for many of the collections described in this book. In her chapter, Lori Emerson gives a vivid account of the development of a Media Archaeology Lab within the institutional context of University of Colorado at Boulder. Emerson also explores the dramatic impact that this hands on approach has had to learning and research within the university, overturning many of the traditional separations of academic thinking.

Media archaeology is concerned with what could have been, what might have been, and what fleetingly was. Emerson analyses the information architecture of the Canon CAT from precisely this perspective, highlighting its distinctive approach to documents and their retrieval which is markedly different to the standard Microsoft-derived model that we are now used to. Media archaeology is interested in technologies that were abandoned (often for no good reason), as well as in imagining new uses for technologies that eventually fell by the wayside. This exploration of the potential affordances of historic technologies is explored in several essays in Huhtamo and Parikka's influential collection *Media Archaeologies: Approaches, Applications, and Implications (*2011). As his essay in this collection demonstrates, Kristof Vrancken owes much to this approach in developing his extraordinary

exploration of the early nineteenth century anthotype photographic method. He seizes on the vegetable basis of the process to give it a startlingly contemporary re-use. Often through community based projects, he uses anthotype photography as a way of understanding the problems of post-industrial society: the legacy of pollution, the overvaluation of permanence and digital perfectability, the reliance on technologies whose internal workings are hidden from their users.

Media archaeology is also interested in the specific effects or feel of abandoned media technologies (see Hutamo & Parikki, 2011). In their chapter, Matthew Hockenberry and Jason LaRiviere describe the Dead Media Streaming Service which revives disused video formats to reproduce their specific 'aura' through a film streaming service. The chosen formats are directly related to the moment of the cultural impact of the films, or even, as in the case of Cronenberg's *Videodrome* to the technologies directly referenced in the film's own narrative. Pušnik's essay shows the strong attachment that citizens often had with 'their' piece of technology through her vivid analysis of the users of Walkman cassette tape players.

Media archaeology focusses on what could have been as well as what was. This emphasis is important as a way of avoiding the dominant way of thinking about media technologies, criticized by Fickers and van den Oever in this volume, which studies only what was rather than the whole range of affordances of any piece of technology. It is all too easy to take as natural or inevitable the systems that emerged from the complex negotiations between users, manufacturers and broader social interests. This social process of realizing specific technological affordances (and, by implication, downplaying others) has been charted by social constructivist historians of technology. Through its contrasting emphasis on exploring

all potential affordances of technologies, the media archaeology approach can produce a distinctive hands on practice. This practice seeks to find uses for media technologies beyond those for which they were originally designed, as well as revisiting the specific 'structure of feeling' (Williams 1977) which inhabited their one-time use.

The media archaeology approach works best when applied to processes or independent pieces of equipment rather than the complex arrays that are often deployed in media production, either together or serially in an interdependent production chain. It is hard to see what unrealized affordances exist in a specialized piece of equipment like an Acmade Compeditor, commonly known as the 'picsync', designed for the specific purpose of synchronizing moving images and magnetic sound when they are being married together during film editing. Many of the chapters in this collection are centred around the attempt to deal with this technological legacy: the legacy of the realized affordances of technologies and technologies designed for specific purposes, as many media technologies were. It emphasizes the way in which those technologies were once owned by or used by people in both work media and media play and pleasure. Several of the chapters are the result of the ADAPT research project on the major ways in which television programmes were made in the analogue era. Ellis, Hall and Murphy discuss the particular variant of the hands on history approach which this project adopted.

This collection examines a wider range of hands on history approaches which, together, represent a sustained attempt to come to terms with the legacy of 'obsolete' media equipment that now surrounds us. This involves both specialized production equipment made bespoke or in small batches, and consumer equipment that was usually produced by the millions on a

production line. They have one thing in common: they were linked together by complex and interdependent relationships: from television production to television sets and home videotape; from games consoles to specifically designed software; from the Walkman to the commercial distribution of music by radio or pre-recorded cassettes.

Specialist items of equipment, designed and produced for very specific purposes, present a number of problems for subsequent generations. Not only can their purpose often be obscure, but also they present problems for reuse or recycling. The question of loss and waste, and the problems of electronic waste in particular, have been raised by writers as diverse as Gabrys (2011), Parikka (2015) and Strauven (2013) specifically in relation to media equipment, and is raised again in this collection by Emerson. The rate of equipment obsolescence in media industries is high. Equipment tends to be used intensively and then discarded. This tendency is intensified by the push for ever-newer consumer experiences and the lack of compatibility between proprietary systems and older versions, often simple things like software or styles of physical connectors, as Hockenberry discusses in relation to videotape.

The move from analogue to digital media systems has been particularly wasteful in this regard. ‘Backwards compatibility’ has not been a priority for manufacturers and innovators who have sought instead to gain market advantage by selling ‘all-new’ systems. Many consumers prefer a bricolage approach, marrying older but familiar equipment with the new. But the dominant approach to the marketing of technology has forced consumers to abandon technologies to which they have become profoundly attached, as Pušnik demonstrates in relation to the Walkman, and, in a very different context, Wade describes in relation to arcade games. Those involved in the hands on history movement are all, to some degree, involved in

a stubborn resistance to such trends. The amateur collectors and maintainers of equipment; the curators of hands on museum collections; those who study media history through the prism of production studies or media archaeology; those who reconstruct historic media events or techniques; and even those who simply use old equipment as decorative items: all are engaged in a form of stubborn resistance to the onward rush of equipment obsolescence.

The approaches to hands on media history in this collection tend to focus on exploring and understanding the social implementation of media technologies. The chapters range from production to consumption, from still to moving image, from sound recordings to gaming. Together they interrogate 'history' as well as the meaning and importance of its 'hands on' variant. To work with the hands on approach to history of media inevitably brings to the fore issues of memory and repetition, since much media history is still "within living memory". Jackson's essay in this collection discusses the citizen curation of memories of a TV work culture, working up material and reminiscences volunteered through a Facebook group into a more substantial history of the BBC's now-demolished Pebble Mill studios. She asks the crucial question of who this history is for: the participants and their circle, or a wider public.

Several essays in this volume address practices of reenactment, recreation, and simulation. Nick Hall's contribution to this volume teases out the various practices involved in 're-enactment' where popular TV formats and social media encounters with 'old' technologies demonstrate the widespread appeal of the hands on exploration of the past. He discusses the ADAPT project's approach to re-enactment as an active process of remembering for the participants who were re-enacting or recalling their younger selves. Amanda Murphy provides a guide to this complex process of revival of old broadcast technologies in the hands

of their expert users. Mary Agnes Krell provides another approach in her discussion of 'rephotography' which involves re-enacting in the present the precise position and disposition of a photographer in the past in order to measure historic change and distance rather than to emulate the past. Re-enactment involves both gain and loss, both remembering and forgetting, in a complex process of understanding history as a process of change whilst trying to recover as much as possible of the haptic experience of the past. The emulation of early computer games as proposed by Fabian Offert is a good example of this process. He discusses how the software emulation of hardware that is no longer operational brings old games back to life so that they can be used by their one-time expert players as well as new participants. However, this process strips away the last vestiges of the rich social environment into which many of these games were deployed: the subversive and slightly seedy world of the arcades described by Alex Wade. It is a truism that our memories are treacherous, yet that we all depend on them for our orientation in the world. The hands on approach can stimulate memories that have remained latent or hidden, leading to a productive questioning of our settled accounts of our past, confronting us with 'things we have forgotten about' and reviving a different, earlier, sense of self.

The hands on history approach to media provides a new approach to understanding one of the central questions of modern life: the relationship between people and the technologies they use. It forces us to re-evaluate simplistic accounts of technological progress, as Fickers and van den Oever demonstrate here. It show that, as Ellis discusses, the habitual division between mind and brain is an inadequate model for understanding the co-evolving relationship between technologies and humans. This relationship has long been one of mutual adaptation, requiring the development of skills which are the basis of any process of intellectual apprehension of the world in which we live. Finally, the hands on approach also

shows that our current direction of technological development is a choice rather than a given, the result of social negotiations and human decisions rather than an inevitable movement.

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