

## CHAPTER 4

# Digital History 1.5

## A Middle Way between Normal and Paradigmatic Digital Historical Research

Mats Fridlund

History is one of the oldest and most conservative humanist disciplines, which begs the question how it could react to the current third ‘generation’ or ‘wave’ of digital history and its new potential to transform the practice of historians’ research. History as a discipline is according to some digital historians at a crossroads, ‘in a transitory moment’<sup>1</sup> and ‘standing on the edge of a conceptual precipice’. The ‘understanding and practice of traditional history’ has been said to be ‘facing a fundamental “paradigm shift”’ and ‘straddling a line between revolution and continuity’ and that the resolution of ‘this tension is going to be a central part of historians’ tasks over the coming years’.<sup>2</sup> Some historians claim that ‘digital history has become the buzz-word for avant-garde historical scholarship in the digital age’,<sup>3</sup> while others worry about external interests and pressures from funders, governments and industrial stakeholders and the possibilities of reallocation of resources and ‘fear for the hermeneutic character of the humanities, and a reduction of humanities research to data crunching or to a view that proclaims the search for underlying patterns and structures in human history and culture to be its essence’.<sup>4</sup> The overall concern is that history will be transformed into a new primarily quantitatively focused discipline

---

### How to cite this book chapter:

Fridlund, M. (2020). Digital history 1.5: A middle way between normal and paradigmatic digital historical research. In M. Fridlund, M. Oiva, & P. Paju (Eds.), *Digital histories: Emergent approaches within the new digital history* (pp. 69–87). Helsinki: Helsinki University Press. <https://doi.org/10.33134/HUP-5-4>

where traditional ‘analogue history’ focused on narrative and close and deep reading of primary sources will be marginalised.

This chapter wants to take these hopes and fears of a paradigm shift in history seriously and I will use my training as a historian and theorist of modern science and technology to analyse and conceptualise what such a paradigmatic change of historical science might mean. To do this, I will discuss what I have elsewhere identified to be the main methodological strands of computational digital history and in this use research from history and philosophy of science on revolutionary and paradigmatic change within science, and especially Thomas Kuhn’s historical and philosophical research on scientific revolutions.<sup>5</sup> In doing this, I have made the choice to, rather than provide an empirical case study of the practices of current digital historians, combine a description of some of the current practices within historical research with a larger conceptualisation of what I and other digital historians have identified as some of the central methodological elements of the new digital history.

The reason for this is that I consider it to be crucial for current and future digital historians to analyse and think reflectively about their new emergent historical practices. We need empirical descriptions of current historical practice, but we need critical reflections and conceptualisations even more. As a conceptually minded historian, it is crucial for me to have conceptual tools that helps us better see and better understand. In this, I am inspired by Joseph Schumpeter’s statement on the foundation of historical analysis:

Analytic effort starts when we have conceived our vision of the set of phenomena that caught our interest, no matter whether this set lies in virgin soil or in land that had been cultivated before. The first task is to verbalize the vision or to conceptualize it in such a way that its elements take their places, with names attached to them that facilitate recognition and manipulation, in a more or less orderly schema or picture.<sup>6</sup>

Thus, the central task of this chapter is to attempt to conceptualise and attach names to some of the central elements of the new emerging digital history practices so that we can start our analytic efforts to better understand the new emerging digital history.

### **Paradigmatic Change in Sciences, History of Science and Historical Sciences**

There are especially two main areas of Thomas Kuhn’s research on scientific revolutions that are of relevance to understanding the current changes within digital history. The first is Kuhn’s research on what he described as ‘the second Scientific Revolution’ of the 19th century and on the historical impact of quantification of earlier qualitative research fields. Quantification, Kuhn argued, was central for understanding the historical development of scientific research and,

in 1961, in an article published just before *Structure of scientific revolutions* and at the same time as the historical sciences were entering their first quantitative ‘Cliometric Revolution’, Kuhn investigated ‘the effects of introducing quantitative methods into sciences that had previously proceeded without major assistance from them.’<sup>7</sup> Kuhn starts his article describing how the Social Science Research Building at the University of Chicago on its facade

bears Lord Kelvin’s famous dictum: ‘If you cannot measure, your knowledge is meager and unsatisfactory.’ Would that statement be there if it had been written, not by a physicist, but by a sociologist, political scientist, or economist? Or again, would terms like ‘meter reading’ and ‘yardstick’ recur so frequently in contemporary discussions of epistemology and scientific method were it not for the prestige of modern physical science and the fact that measurement so obviously bulks large in its research?<sup>8</sup>

In his article Kuhn studies how the physical sciences achieved this exemplary and aspirational character for other sciences to follow, something which still is very much with us in the current debate on digital humanities and digital history. The reason for physics’ status as the contemporary model science, Kuhn posited, could be understood as coming from that

physicists, as a group, have displayed since about 1840 a greater ability to concentrate their attention on a few key areas of research than have their colleagues in less completely quantified fields. In the same period, if I am right, physicists would prove to have been more successful than most other scientists in decreasing the length of controversies about scientific theories and in increasing the strength of the consensus that emerged from such controversies. In short, I believe that the nineteenth-century mathematization of physical science produced vastly refined professional criteria for problem selection and that it simultaneously very much increased the effectiveness of professional verification procedures.<sup>9</sup>

And the reason for this in its turn came from how the physical sciences “came to make use of quantitative techniques at all.”<sup>10</sup> Perhaps surprisingly to some, then and now, the physical sciences had not always been based on measurements and mathematics. Some parts of physics, what Kuhn described as the ‘traditional sciences’ in the form of astronomy, optics and mechanics, had developed considerably quantitatively before the first scientific revolution, while the relatively new ‘Baconian sciences’, ‘the study of heat, of electricity, of magnetism, and of chemistry’, had not been a systematic field of inquiry previously, but ‘owed their status *as sciences* to the seventeenth century’s characteristic insistence upon experimentation and upon the compilation of natural histories, including histories of the crafts.’<sup>11</sup> Their quantification and a wider

and more thorough mathematisation of physics overall took place during the first half of the 19th century and was accompanied by a number of new instruments, conceptualisations, theories and institutionalisations, which was part of what Kuhn described as a second scientific revolution of the sciences. The larger question in focus of this chapter is whether the historical sciences is currently in such a Kuhnian moment.

The second relevant area of Kuhn's research is his more widely known general theory of scientific change that was first presented in *Structure of scientific revolutions* (1962) and that he continued to revise and refine for the remainder of his career. Kuhn's theory uses the history of scientific development especially during the first scientific revolution from the 15th to the 17th centuries to design a theory that outlines how a traditional or 'normal science' through a scientific revolution transforms into a new science, a radically different paradigm of knowledge practice. In this perspective, the response of a scientific community to 'crisis' in the form of a major epistemological disruption usually follows either of two main paths, what can be described as the reintegration and domestication of the new disruption as part of the existing framework of traditional 'normal' science, or the revolutionary transformation of the traditional science into a new science.

Kuhn's theory of scientific revolutions has been important in not just helping historians of science conceptualise changes within the natural sciences, but also in helping historians in general to better understand change within their respective domains. It is difficult to exactly translate Kuhn's terminology to other areas and as I. Bernard Cohen points out, there are many problems with using Kuhn, such as that 'historians and philosophers of science do not agree on what constitutes or defines a revolution in science; they do not have an objective test for the occurrence of such a revolution', and that 'there are certain kinds of revolutions in science that do not exactly fit Kuhn's schema'.<sup>12</sup> Nevertheless, despite these obstacles, several historians have used Kuhn's conceptualisations to understand change also within historical disciplines. As David Hollinger has pointed out, 'Kuhn's terms have been employed explicitly by historians of art, religion, political organization, social thought, and American foreign policy'.<sup>13</sup> Those historians also include Thomas Kuhn himself, as is clear from his remark on an upcoming academic discussion of Martin Bernal's 'Black Athena' theory of ancient history, when he stated that it 'was being held far too soon and that disciplines did not usually respond so quickly to fundamental challenges'.<sup>14</sup>

Aware of these problems, I use Kuhnian terminologies as ideal types (in a Weberian sense) to help me conceptualise the recent past, present and future developments within digital historical practice and to outline two major responses to the challenges of the new computational digital history, as well as sketch a possible methodological middle way navigating between the two. This is an extension of previous research of mine where I, as a part of an empirical digital history study, identified and outlined what I saw as the

major methodological strands within current digital history research. Following Kuhn, I have described the two main ideal type responses towards the new disruptive digital methodologies as them either being domesticated and naturalised as part of traditional history, what Kuhn would describe as 'normal science', which I have termed *digital history 1.0*, or taking the second more revolutionary route in the form of a paradigmatic *digital history 2.0*, radically transforming and disciplining the practice of historical research.<sup>15</sup> However, as an alternative to these two main routes of conservation or revolution, I also outline a potential third 'middle way' between the 'normal' practice of historical science and a potentially 'paradigmatic' digital history. The overarching question is whether the new digital historians will want to transform, and succeed in transforming, the historical discipline overall, to break off and form a new historical discipline, or whether they prefer to remain part of history's 'disciplinary mosaic'.<sup>16</sup>

### Our Invisible Digital History

The digital has already changed historians' practice so that today 'all historians are already digital' whether or not they 'self-identify as digital historians',<sup>17</sup> although perhaps in ways invisible to or at least not reflected upon by most historians. History is already changed through historians' everyday use of digital tools and materials, something which can roughly be divided into the production, communication, presentation and administration of historical research.<sup>18</sup> The following description might to some appear trivial, banal or mundane, but that should not diminish its importance; on the contrary, this ordinariness makes it even more important for understanding the wider impact of the digital on the historians' craft.

The first and most important influence of digitisation is on historians' production. Like other office workers, the overwhelming majority of historians have since the 1980s been relying on digital computers as their foremost research tool. Most importantly, computers are used for writing and note-taking and since at least the 1990s also for organising and storing primary and secondary digital source materials, often in such portable digital document formats as photographed, scanned or born-digital images of archival documents, texts, photographs, artifacts, journal articles and books. The existence on most historians' computers of hundreds or thousands of files with names ending in suffixes such as .doc, .pdf, .xls and .jpg provides ample material evidence of the impact on historians' practice from reading, watching, manipulating and writing of digital materials.

Digitisation's second major impact is on how we historians communicate with institutions and individuals that provide access to source materials for our research, such as archives and libraries, as well as with other historians and non-historical researchers within our research fields. Since the 1990s, emails,

mobile and smart phones, text messaging and social media has afforded historians ever faster and wider communication possibilities. Third, the digital has impacted the historians' practice through making possible their research results to be communicated through new digital forms of representations. This is through presentations at academic conferences, seminars and talks, primarily through much easier and efficient use of digital images, figures and graphs, as well as the increased use of digital presentation software programs such as PowerPoint, Keynote and Prezi as well as online presentations and meeting using digital applications such as Skype and Zoom. In addition, preliminary and finished research is routinely presented in the form of digital documents to colleagues, conferences and publishers, as conference and seminar papers, manuscripts, preprints and offprints of articles, chapters and books. The final way in which historians' research practice has been impacted is with regard to its practical organisation and administration, through the various ways in which the digital tools and formats described above, together with the internet, have changed the possibilities for conducting research more effectively and (mostly if not always) with less costs in time and money. This includes all the ways in which we use the internet and especially search engines, such as Google, Bing and Baidu, to gather practical information about locations, access and opening hours for archives, libraries and museums, as well as conducting practical matters such as booking travel and buying books, source materials and artifacts through services such as Amazon, eBay and Alibaba, and registering and paying online for conferences or memberships in professional organisations.

This normal everyday digital impact on the historian's craft is most often invisible. The hidden digital tools and computational algorithms built into these various applications enabling our research are probably not much reflected upon by most historians, but these concealed tools have enhanced traditional history by making it faster, easier and cheaper in money as well as in time and energy. However, there are also other domesticated forms of digital methods and tools that in more conscious, reflective and visible ways have influenced historians' practice, something which I describe as digital history 1.0.

### **Domesticated Normal Science: Digital History 1.0**

By conceptualising various aspects of historians' practice as 'digital history 1.0', I mean to accentuate that already today many historians, in addition to the invisible application of digital tools discussed above, have intentionally although often without much apparent thought appropriated digital methodologies as a part of their standard historical research practice. Digital history 1.0 includes how historians have integrated the use of digitally enhanced tools and materials as a part of their normal research practice, such as digital databases and resources such as Google, Wikipedia and JSTOR for digitally augmenting their historical research.<sup>19</sup> Such historians might, however, not see themselves as doing 'digital' history, but just 'history', as these digital applications have often

been domesticated and seamlessly incorporated into ‘normal history.’ This digital ignorance or blindness is a returning complaint of digital historians, with statements such that ‘the average historian is at most a passive user of digitised sources in which he/she mostly sees a substitute for the material original’ and ‘carrying out fairly traditional research as if the [digital] resource was not there (but hopefully citing it nevertheless).’<sup>20</sup>

In the vocabulary of the historian and philosopher of science Thomas Kuhn these historians have augmented their ‘normal science’—‘history’—of historical research with the use of various forms of digital sources, tools and methods. By normal science, Kuhn means the established and dominant scientific tradition of conducting research existing within a scientific discipline which ‘often suppresses fundamental novelties because they are necessarily subversive of its basic commitments.’<sup>21</sup> The ignorant attitude among normal historians referred to above can be seen as exemplifying this. Another example is when one digital historian complains about traditional historians’ blindness to how the digital has changed the historians’ practice, how most historians today ‘combine traditional/analogue and new/digital practices, at least in the information gathering stage of their research.’ However, ‘reflection is often missing. On more than one occasion I have heard historians proclaim to be non-digital, as if this were something of which to be proud, while evidently making use of digital resources in their research.’<sup>22</sup> Yet another digital historian describes ‘a degree of condescension and suspicion towards digital resources from many mainstream historians.’<sup>23</sup> These examples could easily be multiplied.

And still, digital history 1.0 has already visibly changed historians’ practice: first, by increasing the number of citations and the diversity of primary sources used, as well as a disproportionate use of citations to online sources.<sup>24</sup> One example is from Canada, the first country to have two of its major newspapers the *Toronto Star* and the *Globe and Mail* digitised in 2002. Research on history doctoral dissertations uploaded to the ProQuest database between 1997 and 2010 showed a 991% increase in citations to the *Toronto Star* after it had been digitised, ‘as opposed to minor increases and even decreases for other newspapers.’<sup>25</sup> Connected to this, digitisation has also changed how historians think of their *archives*. Traditionally, for most historians, an emblem of becoming a ‘real’ historian and marking something of a rite of passage is to carry out research in a physical archive located in a particular (often remote) place where you sit and go through dusty and perhaps previously unread pages of primary sources in the form of paper documents such as letters, minutes, reports, etc. In the digital age, these traditional archives are often supplemented or surpassed by online document archives that you can access from your office chair at your home institution. But even when the historians do visit physical archives, their practice has been changed by the digital in that ‘analytical work is displaced from the archives.’ This is also due to new digital tools, as the

use of digitized finding aids, digitized collections, and digital cameras [that] have altered the way that historians interact with primary sources.

While the centrality of archives to the research process remains, the nature of interactions with archival materials has changed dramatically over time; for many researchers, activities in the archives have become more photographic and less analytical.<sup>26</sup>

By changing the possibilities of access to distanced primary materials, the new digital resources have transformed history.

One striking example of how the digital history practices can be transformative while almost methodologically invisible comes from the research by historians Sönke Neitzel and Harald Welzer on the politics and world view of German Second World War soldiers that was based on a previously unused source material in British and American archives in the form of several hundred thousand pages of transcripts of interrogations with German POWs. This groundbreaking in-depth research on this ‘mind-boggling amount of material’ was only made possible through the use of digital methodologies and was described in the following way in their monograph *Soldaten*: ‘We were able to digitize all of the British documents and most of the American material and sort through it with the help of content-recognition software.’<sup>27</sup> This is all that is said. No further words on their digital research methodology such as what software, search methods or keywords that were used. The choices made and opportunities created by the digital tools have been made almost totally invisible.

It appears that Toni Weller is correct in stating that ‘for most historians, the challenges of the digital age are not ones that are seen to directly concern their research’ and that the suggestion by an author commenting on the tenure, promotion and review process ‘that “learning to use a database, scan materials, and query that database all consume time that could be used to write” is probably a reasonably accurate reflection of the way the majority of historians perceive digital scholarship.’<sup>28</sup> However, there are those historians where the digital is a primary methodological focus in their research practice and who are practising a more radical form of ‘digital history 2.0’.

### Revolutionary Paradigmatic Science: Digital History 2.0

Some digital historians appear to see digitisation’s ‘profound transformation’ of history as inevitable, in that they state that as ‘datasets expand into the realm of the big, computational analysis ceases to be “nice to have” and becomes a simple requirement.’<sup>29</sup> This new paradigmatic digital history practice ‘offers a stark contrast to what has become standard historical practice.’<sup>30</sup> The current revolutionary enthusiasm is in some ways reminiscent of digital history’s first wave in the 1970s when ‘it looked like history might move wholesale into quantitative histories, with the widespread application of math and statistics to the understanding of the past’ and resonate with the past ‘hyperbole that saw computational history as making more substantial “truth” claims, or the invocation



of a “scientific method” of history.<sup>31</sup> The question is whether also the current putative computational revolution will live up to the high hopes and hypes or if it also will wane to become just another small specialised sub-discipline of the historical discipline or that it perhaps will abandon history and emigrate, like many of the first generation of digital historians who left the humanities for the social sciences and its new, more quantitatively inclined sub-disciplines, such as social and economic history.

The question is whether this new potentially revolutionary historical paradigm can be described, in Thomas Kuhn’s words, as the outcome of a scientific revolution ‘from which a new tradition of normal science can emerge.’<sup>32</sup> Kuhn described ‘what all scientific revolutions are about’ in that they

produced a consequent shift in the problems available for scientific scrutiny and in the standards by which the profession determined what should count as an admissible problem or as a legitimate problem-solution. And each transformed the scientific imagination in ways that we shall ultimately need to describe as a transformation of the world within which scientific work was done.<sup>33</sup>

After a paradigm shift, it is not just what is valued as good research that has shifted, but the discipline’s core elements are transformed and the field is reconstructed ‘from new fundamentals, a reconstruction that changes some of the field’s most elementary theoretical generalizations as well as many of its paradigm methods and applications.’<sup>34</sup> What is accomplished in this is the transformation of the ‘disciplinary matrix’—what is considered as the relevant and central methods, significant data, instruments, theory, methods, concepts and working practices. Below, some of the major elements of the possible disciplinary matrix of digital history 2.0 will be outlined.

Digital history 2.0 is taken to represent research practices with a potential to form a new digital historical paradigm primarily focused on new quantitative and computational methods to undertake text analysis and manipulations and visualisations of historical data. Its research systematically use various digital applications and quantitative methodologies for big-data text and data mining, calculations and visualisations, such as topic modelling, network analysis and text and data scraping. Most of these methods necessitate investments in acquiring expertise in or collaborators skilled in coding and database methodologies.

Like with paradigm change within the sciences, the new digital history practice transforms the existing practice by introducing new focus and altering what is valued, making some of the existing ideals and standards less relevant or obsolete in favour of new values and concepts salient to the particular characteristics of the new history. One such new key aspect of the digital history 2.0 can be described as *compression*, which characterises methods that allow the historian ‘to begin with the complex and winnow it down until a narrative emerges from the cacophony of evidence.’<sup>35</sup> This is in contrast to ‘normal history’

where historians, 'like good detectives, test their merit through *expansion*: the ability to extract complex knowledge from the smallest crumbs of evidence, that history has left behind. By tracing the trail of these breadcrumbs, a historian might weave together a narrative of the past.'<sup>36</sup> Some historians even question whether the digital turn will so much change history's foundational concepts to 'render the word "narrative" too confining for describing what historians produce' and to make *historiographies* into a 'more encompassing term'.<sup>37</sup>

Normal historians prefer to describe the empirical foundations of their conclusions in terms of documents, sources and at times even 'facts', while the new digital historians often prefer to talk about 'data'. Jim Mussell describes perhaps *the* core aspect of the new digital history just in that it 'requires a change in focus from document to data'.<sup>38</sup> Data as information, in forms that are able to be processed by computers, is central to the new digital history, qualitatively as well as quantitatively. Its qualitative effect is the view favouring 'data' to signify what counts as the preferred and proper basis for constructing a historical argument. The quantitative impact lies in that the new digital texts provide copious and often very easily accessible source materials for historians. In 2008, a senior digital historian stated with special reference to the recently started digitisation efforts by Google Books, online digital image collections and the creation of digital newspaper archives that it was 'now quite clear that historians will have to grapple with abundance, not scarcity' and that 'nearly every day we are confronted with a new digital historical resource of almost unimaginable size'.<sup>39</sup> In that sense, history could be seen as having entered the era of *big data* or perhaps better 'biggish data'.<sup>40</sup> How much data it takes to makes it 'big' has been described as 'in the eye of the beholder', in that if 'there are more data than you could conceivably read yourself in a reasonable amount of time, or that require computational intervention to make sense of them, it's big enough!'<sup>41</sup> One example of such big data for historians are the online Old Bailey records ([www.oldbaileyonline.org](http://www.oldbaileyonline.org)), which consist of almost 200,000 criminal trials between 1674 and 1913 and 127 million words.<sup>42</sup>

The rise of online archival research and the loss of the manual physical handling of original primary sources is one example of how the material practice of the historian is changing in the digital era. Another example of a radically new social dimension consists of *multidisciplinary teamwork*. This might be one of the most challenging aspects of the new history to many traditional historians. Although many examples exist of co-authored works in history, it is still far from the norm, and when it does occur it is rarely with collaborators from outside historical disciplines. Another changing practice is a shift to totally new activities in that 'less than 5% of the time spent on a project will be time spent analyzing and visualizing data', with the majority 'spent on collecting, cleaning, and interpreting'.<sup>43</sup> Another aspect of the changing historical practice is new digital forms of *publications* as the traditional paper forms of historical publications are not seen as 'suited to the fast-changing discourses of the digital age—demonstrated by the fact that most pure digital history texts tend to be in the form of websites, blogs and online articles and journals rather than the

traditional historical outlet of the monograph.<sup>44</sup> Such new digital forms of publications also make possible new dynamic and interactive forms of presentations with inclusion of digital sound and video files, as well as scalable images, maps and network graphs.

To conclude this discussion of the changing practice of the new digital history practice, I will quote the two computer scientists behind the Culturomics project who also helped to develop the Google Ngram Viewer and when criticised for not having included any historians in their project explained it thus:

Even when we found historians who shared our enthusiasm, there were still great barriers to working together. For instance, [a meeting was convened with] about a dozen interested history students and faculty. The historians who came to the meeting were intelligent, kind, and encouraging. But they didn't seem to have a good sense of how to wield quantitative data to answer questions, didn't have relevant computational skills, and didn't seem to have the time to dedicate to a big multi-author collaboration. It's not their fault: these things don't appear to be taught or encouraged in history departments right now.<sup>45</sup>

In short, history had failed in being willing to work like computer science.

### Semi-Automatic History: Digital History 1.5

Some digital historians propose a less radical transformation than that promised by digital history 2.0, where 'historians do not need to learn new technologies or computer codes; they do not need to become computer scientists.' They disagree with those advocating a revolutionary transformation of the historical practice and argue that a part of 'the problem thus far has been too much emphasis on historians becoming something they are not; to the detriment of the fundamental skills and expertise that is the craft of the historian'.<sup>46</sup> The real challenge lies, such historians argue, 'in persuading the vast majority of historians of the benefit of even relatively simple information technology, not in developing specialist historical tools and methods that would only ever be of relevance to a minority of historians'.<sup>47</sup> Some like Gerben Zaagsma want to go somewhat further and consider that the 'real challenge is to be consciously hybrid and to integrate "traditional" and "digital" approaches in a new practice of doing history'.<sup>48</sup> 'Digital history 1.5' aligns itself with such views and can be described as an acknowledged and reflective digital history 'without the programming' that consist of the use of semi-automatic historical methodologies in between normalised 'digital history 1.0' and paradigmatic 'digital history 2.0' research methods.<sup>49</sup>

Digital history 1.5 is a hybrid or mixed methodology in that it is a combination of quantitative and qualitative historical research methodologies, and semi-automatic as it combines a large amount of manual evaluation with the

systematic use of automatic analysis vested in pre-programmed offline and online calculation and visualisation applications and tools using digital text and databases, such as Google Books, Early English Books Online (EEBO) and digitised historical newspaper archives. That this digital history is without programming is of course not absolutely true in that it does use digital applications based on a lot of computer code and many mathematical algorithms, but this coding and programming is invisible as it is pre-packaged in the various applications and tools: it is 'black-boxed' to the historian user.<sup>50</sup>

What differentiates digital history 1.5 from digital history 1.0 is that it consists of a systematic use of digital tools and sources where the digital methodology is the central method enabling the investigation. Furthermore, it incorporates a conscious reflexivity about the digital sources, resources and methods used in the investigation and is being reflective about its respective strengths and weaknesses. At the same time, it is not 'digital history 2.0' in that in its investigation it is using pre-programmed applications and resources without any additional coding of software, advanced programming of applications or tuning of digital techniques and methodologies. Some specific digital history 1.5 methodologies are semi-automatic text extraction and presentation, which combine quantitative computer-enabled 'distant reading' of big data digital text corpora and qualitative 'close reading' of extracted individual texts.<sup>51</sup> This takes the use of semi-automatically extracted and processed databases where the individual texts can be newspaper and journal articles that could be collected using various online search interfaces such as those that exist at various online newspaper and journal archives.

To conclude this treatment of the hybrid practice of digital history 1.5, two of its central methodological elements will be conceptualised. This is inspired by Ted Underwood's article 'Theorizing research practices we forgot to theorize twenty years ago', which argues the need for digital humanists to 'think more rigorously and deliberately about existing practices'.<sup>52</sup> The first central element is its key technology, as well as a central engine of the potential digital history revolution, in the form of the *search engine*. One problem with talking about 'search' for digital historians is that it is, as Underwood states, 'a deceptively modest name for a complex technology that has come to play an evidentiary role in scholarship'.<sup>53</sup> By 'search' is meant the algorithmic mining of large electronic databases that since the 1990s has been used by humanists. Furthermore, the term 'search' only points to its use as a finding tool and leaves out its wider methodological implications and—echoing digital historians' criticism of traditional historians' negligence of their digital tools as discussed above—that the 'scholarly consequences of search practices are difficult to assess, since scholars tend to suppress description of their own discovery process in published work'.<sup>54</sup> Therefore, as a way of contributing to digital history's conceptual development and to make the existing digital history methodologies more explicit and reflective, I have elsewhere described and named an already existing qualitative digital history methodology. I thus proposed the term *readsearch*

for the methodology of using online keyword searches as being ‘a new hybrid concept denoting a quali-quantitative methodology combining targeted close manual and machine distant reading through the use of search engines on large digital text corpora.’<sup>55</sup>

Furthermore, I have attempted to further explicate the various forms of read-search methodologies and problematise the use of search for research. Taking inspiration from Underwood, who explains that ‘a full-text search is often a Boolean fishing expedition for a set of documents that may or may not exist,’<sup>56</sup> and in line with this I differentiate between different readsearch methodologies by categorising them into three main forms: *spearfishing*, *angle* and *trawl readsearch*. ‘Spearfishing readsearch’ designates a form of search consisting of browsing through a large text corpora close to what can be described as ‘online microfilm browsing,’ in that the search interface is using various keywords or dates to focus the search, but at the same time allow the reader to immerse him- or herself in the text until he or she comes across any relevant findings. When using ‘angle readsearch,’ the researcher searches for texts referring to one specific unique event, person or place and thus like an angler adapts the angles (the search terms) to tailor them for best catching a particular fish (an event or entity). Finally, in the use of ‘trawl readsearch,’ the search is used to find many hits of a general term, word or phenomena and this is the form of readsearch where the distant machine reading plays the largest part. Like when fishing using a trawl, this is a combination of machine and manual reading. After a large fishing trawler makes a catch in its trawl, it hoists it up and empties the catch onto the vessel and then manually goes through the catch to sort out and ‘throw back’ the unwanted catch: fish of the wrong species or too small to matter, as well as garbage caught up in the trawl. Similarly, the texts found through a search’s machine reading is in a trawl readsearch examined manually to sort out the valuable and searched-for texts. This is a methodology especially used when tracing the change of a concept or a term over time. Some readers might find these methodological neologisms as too idiosyncratic to be meaningful and whether digital historians in the future will follow in adapting the specific readsearch terminologies is of less importance. What is crucial for them to follow, however, is in reflecting on their digital epistemology, what their use of digital methods does to the historical knowledge being produced and to explicitly conceptualise and theorise their practice as historians using digital tools and resources.

The second main element of digital history 1.5 connects to historian Andreas Fickers’ claims that as a response to the salience of the new digital sources, the discipline of history needs ‘a new digital historicism’. This historicism should be ‘characterized by collaboration between archivists, computer scientists, historians and the public, with the aim of developing tools for a new digital source criticism.’<sup>57</sup> Along with many digital historians, I would add to this the need for a *digital resource criticism* that extends historians’ critical faculties to the digital resources they use, such as the search engines, algorithms, programs

and applications. Overall, a digital historian ‘requires a more advanced understanding of the affordances of the digital in order to perform more advanced research’<sup>58</sup> Historians, like most users of digital technologies, use technology ‘without reflection, without understanding how it *actually* works’ and thus need to develop a new digital reflexivity. Like historians are trained to consider and look for the contextual and authorial biases of our historical sources we need to think about ‘the worldviews built into our tools,’<sup>59</sup> as too often we tend to forget ‘that our digital helpers are full of “theory” and “judgement” already. As with any methodology, they rely on sets of assumptions, models, and strategies. Theory is already at work on the most basic level when it comes to defining units of analysis, algorithms, and visualization procedures.’<sup>60</sup> In doing this, the traditional skills of historians

are still necessary, but the focus on practice—on doing things with data—extends their application, forcing a recognition of the constructed nature of evidence and its relation to the absent past. Necessarily speculative, the historian must bring his or her expertise to bear on these digital environments and evaluate the plausibility of what they both embody and imply.<sup>61</sup>

When we historians start ‘to think digitally,’ we can gain a better understanding of the underlying mechanisms, algorithms, programmed omissions and choices of our digital tools and allow the historian ‘to be a better critic, a better consumer of digital data, a better user,’<sup>62</sup> and thus a better historian.

### **Conclusions: Business as Usual or Going Fully Digital?**

This chapter has in many ways gone against historians’ normal practice. Instead of trying to see the patterns and causes of past events after the dust has settled it has tried to discern the contours of emerging phenomena and to conjecture about possible future outcomes. This it has done to try to better understand which way or ways history will take in our ever increasing digital age. Will it be the old-trodden one or a new and radically different path? This has been a necessarily speculative exposition of three routes for digital historians that could be summarised as unreflective normalisation, paradigmatic transformation and reflective appropriation. In this, it has tried to point to the third middle way as a wider route for historians who are neither satisfied with just continuing with their historical ‘business as usual’ by staying agnostic about its already existing digital methodological dimensions nor prepared to join the specialised minority of historians who will go ‘fully digital’ by learning to code or enter into collaborations with computer and information scientists. In this, I align myself with previous digital historians, such as Toni Weller, who have argued that ‘part of the “them and us” problem thus far has been too much emphasis

on historians becoming something they are not; to the detriment of the fundamental skills and expertise that is the craft of the historian.<sup>63</sup>

To conclude, let us return to Thomas Kuhn and take some solace from his statements ‘that there can be small revolutions as well as large ones, that some revolutions affect only the members of a professional subspecialty’<sup>64</sup> and on rare occasions ‘two paradigms can coexist peacefully’.<sup>65</sup> Furthermore, history teaches us that revolutions, scientific as well as political, always come at a cost and bring losses as well as benefits, such as in

the transition from an earlier to a later theory, there is very often a loss as well as a gain of explanatory power. Newton’s theory of planetary and projectile motion was fought vehemently for more than a generation because, unlike its main competitors, it demanded the [conceptual] introduction of an inexplicable force that acted directly upon bodies at a distance. Cartesian theory, for example, had attempted to explain gravity [mechanically] in terms of the direct collisions between elementary particles. To accept Newton meant to abandon the possibility of any such explanation.<sup>66</sup>

However, although the new ways of understanding the world were triumphant, ‘the price of victory was the abandonment of an old and partly achieved goal. For eighteenth-century Newtonians it gradually became “unscientific” to ask for the cause of gravity.’<sup>67</sup> The task ahead for us historians is to make sure that, whoever will succeed in shaping the apparently inevitable further digitisation of the historical discipline, into a domesticated or revolutionary historical practice or something in between, that history’s rewards outweigh its losses.

## Notes

<sup>1</sup> Graham et al. 2015: 35.

<sup>2</sup> Weller 2013b: 1; Graham et al. 2015: 35. William Cronon in 2012 as President of the American Historical Association said that he ‘increasingly believe[s] that the digital revolution is yielding transformations so profound that their nearest parallel is to Gutenberg’s invention of moveable type’ (see Cronon 2012).

<sup>3</sup> Weller 2013a: 195.

<sup>4</sup> Zaagsma 2013: 24; Weller 2013a: 195.

<sup>5</sup> Fridlund 2017; Fridlund & La Mela 2019.

<sup>6</sup> Schumpeter 1954: 42.

<sup>7</sup> Kuhn 1961: 162.

<sup>8</sup> Ibid.: 161.

<sup>9</sup> Ibid.: 190.

<sup>10</sup> Ibid.: 185.

- <sup>11</sup> Ibid.: 186, emphasis in the original.
- <sup>12</sup> Cohen 1987: 24, 31.
- <sup>13</sup> Hollinger 1989: 108.
- <sup>14</sup> Bernal 1991: xix.
- <sup>15</sup> My distinction between digital history 1.0 and 2.0 is similar to but more general than that of Jim Mussell, who primarily discusses changing digital history practice in relation to the digitisation of source materials. See Mussell 2013: 80–91.
- <sup>16</sup> Graham et al. 2015: 4.
- <sup>17</sup> Ibid.: xvii.
- <sup>18</sup> This description focuses on the historian as a researcher and does not include changes to the historian's practice as a teacher, administrator or public historian.
- <sup>19</sup> Besides using 'invisible' domesticated digital tools such as word processing, email, search engines and electronic articles, pictures and documents in their normal professional research practice.
- <sup>20</sup> Zaagsma 2013: 18; Mussell 2013: 90.
- <sup>21</sup> Kuhn 1970: 5.
- <sup>22</sup> Zaagsma 2013: 17.
- <sup>23</sup> Weller 2013b: 4.
- <sup>24</sup> Bilansky 2017: 517.
- <sup>25</sup> Graham et al. 2015: 48.
- <sup>26</sup> Rutner & Schonfeld 2014: 8.
- <sup>27</sup> Neitzel & Welzer 2012: ix–x.
- <sup>28</sup> Weller 2013b: 3.
- <sup>29</sup> Graham et al. 2015: 4.
- <sup>30</sup> Ibid.: 1.
- <sup>31</sup> Ibid.: 23.
- <sup>32</sup> Kuhn 1970: 84.
- <sup>33</sup> Ibid.: 6–7.
- <sup>34</sup> Ibid.: 85.
- <sup>35</sup> Graham et al. 2015: 2.
- <sup>36</sup> Ibid.: 1, emphasis added.
- <sup>37</sup> Ibid.: 32.
- <sup>38</sup> Mussell 2013: 81.
- <sup>39</sup> Daniel J. Cohen in Cohen et al. 2008: 455. Cohen was echoing and answering the question posed in 2003 by his digital history predecessor Roy Rosenzweig in an article entitled 'Scarcity or abundance?'.
- <sup>40</sup> Graham et al. 2015: 264.
- <sup>41</sup> Ibid.: 3.
- <sup>42</sup> Hitchcock et al. 2012.
- <sup>43</sup> Graham et al. 2015: 235.
- <sup>44</sup> Weller 2013b: 4.
- <sup>45</sup> Aiden & Michel 2011.



- <sup>46</sup> Weller 2013b: 1.
- <sup>47</sup> Anderson 2008.
- <sup>48</sup> Zaagsma 2013: 17.
- <sup>49</sup> My designation of digital history 1.5 and 2.0 is close to what Zaagsma describes as ‘plain IT’ and ‘enhanced IT’ respectively (see Zaagsma 2013: 12).
- <sup>50</sup> Fridlund 2017; Fridlund & La Mela 2019: 12.
- <sup>51</sup> Moretti 2000; Moretti 2005; Moretti 2013.
- <sup>52</sup> Underwood 2014: 64.
- <sup>53</sup> Ibid.
- <sup>54</sup> Ibid.: 65.
- <sup>55</sup> Fridlund & La Mela 2019: 13. This is similar to ‘critical search’ as described by Jo Guldi (see Guldi 2018).
- <sup>56</sup> Underwood 2014: 64.
- <sup>57</sup> Fickers 2012: 26.
- <sup>58</sup> Mussell 2013: 91.
- <sup>59</sup> Graham et al. 2015: 54.
- <sup>60</sup> Rieder & Röhle 2012: 70.
- <sup>61</sup> Mussell 2013: 91.
- <sup>62</sup> Graham et al. 2015: 267.
- <sup>63</sup> Weller 2013a: 195.
- <sup>64</sup> Kuhn 1970: 49.
- <sup>65</sup> Ibid.: xi.
- <sup>66</sup> Kuhn 1961: 184.
- <sup>67</sup> Ibid.

## References

- Aiden, E. L., & Michel, J.-B.** (2011). Thoughts/clarifications on Grafton’s ‘Loneliness and Freedom’. *Culturomics*. Retrieved from <http://www.culturomics.org/Resources/faq/thoughts-clarifications-on-grafton-s-loneliness-and-freedom>
- Anderson, I.** (2008). History and computing. Blog *Making history: the changing face of the profession in Britain*. Retrieved from [http://www.history.ac.uk/makinghistory/resources/articles/history\\_and\\_computing.html](http://www.history.ac.uk/makinghistory/resources/articles/history_and_computing.html)
- Bernal, M.** (1991). *Black Athena: Afroasiatic roots of classical civilization*, Vol. II: *The archaeological and documentary evidence*. New Brunswick, NJ: Rutgers University Press.
- Bilansky, A.** (2017). Search, reading, and the rise of database. *Digital Scholarship in the Humanities*, 32, 511–527.
- Cohen, I. B.** (1987). Scientific revolutions, revolutions in science, and a probabilistic revolution 1800–1930. In L. Krüger, L. J. Daston, & M. Heidelberger (Eds.), *The probabilistic revolution*, Vol. 1: *Ideas in History*. Cambridge, MA: MIT Press.

- Cohen, D. J., Frisch, M., Gallagher, P., Mintz, S., Sword, K., Murrell Taylor, A. M., Thomas, III, W. G., & Turkel, W. J. (2008). Interchange: the promise of digital history. *Journal of American History*, 95, 452–491.
- Cronon, W. (2012, 1 January). The public practice of history in and for a digital age. *Perspectives in History Online*. Retrieved from <http://www.historians.org/publications-and-directories/perspectives-on-history/january-2012/the-public-practice-of-history-in-and-for-a-digital-age>
- Fickers, A. (2012). Towards a new digital historicism? Doing history in the age of abundance. *VIEW: Journal of European Television History and Culture*, 1, 19–26.
- Fridlund, M. (2017, 18 May). *Digital History 1.5: Historical research between domesticated and paradigmatic digital methods*. [Video fil]. Umeå: Hum Lab, Umeå University. Retrieved from [https://web.archive.org/web/20200510185709/http://stream.humlab.umu.se/?streamName=digital\\_history\\_1\\_5](https://web.archive.org/web/20200510185709/http://stream.humlab.umu.se/?streamName=digital_history_1_5)
- Fridlund, M., & La Mela, M. (2019). Between technological nostalgia and engineering imperialism: digital history readings of China in the Finnish technoindustrial public sphere 1880–1912. *Tekniikan Waiheita*, 35(1), 7–40.
- Graham, S., Milligan, I., & Weingart, S. (2015). *Exploring big historical data: the historian's macroscope*. London: Imperial College Press.
- Guldi, J. (2018). Critical search: a procedure for guided reading in large-scale textual corpora. *Journal of Cultural Analytics*. DOI: <https://doi.org/10.22148/16.030>
- Hitchcock, T., Shoemaker R., Emsley, C., Howard, S., McLaughlin J., et al. (2012, 24 March). *The Old Bailey proceedings online, 1674–1913*. Version 7.0. Retrieved from <http://www.oldbaileyonline.org>
- Hollinger, D. A. (1989). *In the American province: studies in the history and historiography of ideas*. Baltimore, MD: Johns Hopkins University Press.
- Kuhn, T. S. (1961). The function of measurement in modern physical science. *Isis*, 52, 161–193.
- Kuhn, T. S. (1970). *The structure of scientific revolutions*. 2nd edn. Chicago, IL and London: University of Chicago Press.
- Moretti, F. (2000). Conjectures on world literature. *New Left Review* n.s. 1(1), 54–68.
- Moretti, F. (2005). *Graphs, maps, trees: abstract models for a literary history*. London: Verso.
- Moretti, F. (2013). *Distant reading*. London and New York, NY: Verso Books.
- Mussell, J. (2013). Doing and making: history as digital practice. In T. Weller (Ed.), *History in the digital age* (pp. 79–94). London and New York, NY: Routledge.
- Neitzel, S., & Welzer, H. (2012). *Soldaten: on fighting, killing, and dying: the secret World War II tapes of German POWs*. New York, NY: Simon & Schuster.

- Rieder, B., & Röhle, T.** (2012). Digital methods: five challenges. In D. M. Berry (Ed.), *Understanding digital humanities* (pp. 67–85). Houndmills: Palgrave Macmillan.
- Rutner, J., & Schonfeld, R. C.** (2014). *Supporting the changing research practices of historians*. New York, NY: Ithaca S+R.
- Schumpeter, J. A.** (1954). *History of economic analysis*. Oxford: Oxford University Press.
- Underwood, T.** (2014). Theorizing research practices we forgot to theorize twenty years ago. *Representations*, 127, 64–72.
- Weller, T.** (2013a). Conclusion: a changing field. In T. Weller (Ed.), *History in the digital age* (pp. 195–205). London and New York, NY: Routledge.
- Weller, T.** (2013b). Introduction: history in the digital age. In T. Weller (Ed.), *History in the digital age* (pp. 1–19). London and New York, NY: Routledge.
- Zaagsma, G.** (2013). On digital history. *BMGN—Low Countries Historical Review*, 128(4), 3–29.