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## SITUATING INFORMATION HISTORY

### The History and Historiography of Information and Its Practices

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Although the term “information history” has been in circulation since at least the mid-1980s, *The Routledge Handbook of Information History* is, we believe, by far the largest collection of studies (thirty-seven in total) to make use of it in its title.<sup>1</sup> We view the *Handbook* as both an endorsement of information history as a legitimate, growing sub field of history and as an opportunity to promote it further. We recognise the value and validity of employing information—*information practices*, to be specific—as a lens through which history can be viewed, researched, and explained.<sup>2</sup> In addition, we are convinced that this perspective will be acknowledged and adopted increasingly in the future; for if, as some claim, information has become main propellant of our (post) modern age, then its history will inevitably become ever more important and irresistible. Information history is a large, wide, and interdisciplinary field which contributes to our understanding of how information practices have determined, and been determined by, past societies.

#### Definition and Context

In what has become an amplified age of misinformation, disinformation, fake news, and spin, the last thing we would want to do is deceive readers of the *Handbook* by offering a title that misleads.<sup>3</sup> We wish to make it clear, therefore, that the word “information” in the *Handbook*’s title is mostly used by contributors to the volume as a synonym for the phrase “information practice,” by which we mean the customary or repeated performance of an activity, perhaps a skill, that could variously involve the creation, collection, organisation, management, falsification, systemisation, or communication of information. However, our enthusiasm for the phrase “information practice” by no means threatens our recognition of the past and present interpretation of the meaning of information as something that is reified—a view that is closely associated with modernity.<sup>4</sup>

The phrase “information history” immediately raises the question of what the word “information” means.<sup>5</sup> The need to grapple with the matter of definition might be seen as an imperative, given any perceived novelty of the field of information history. There exists an enduring lack of consensus regarding the meaning of information. As Thomas Haigh has

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stated: “Information, like other concepts such as progress, freedom, or democracy, has become ubiquitous because, not in spite, of its impressive degree of flexibility.”<sup>6</sup> Expressing a similar frustration with its slippery nature, Albert Borgman observed that information is a difficult phenomenon to analyse and discuss, not because its essence is mysterious (he views it in the tradition of “signal theory” as revolving fundamentally around a process involving a messenger, a message, and a receiver) but because “throughout human history it has been evolving in tiny steps from something simple and natural to something exceedingly complex and technical.”<sup>7</sup>

Excavating the many definitions and perceptions of information over time and in a variety of milieux would require deep engagement in complex philosophical thinking on the nature of knowing and knowledge (the same might be said of a concept like virtue, the understanding of which obviously differs between cultures and is temporally fluid). We, therefore, offer a much simpler approach, one that allows our contributors to explore the nature of information as it was understood in the contexts about which they are writing. This is preferable to parachuting current understandings of information into different time periods and contexts; we hope thereby to avoid the dangers of presentism, which identifies phenomena in the past as relevant because they are deemed to be important in the present. This said, we are under no illusion that to disengage from presentist perspectives is no easy matter. Past and present are in perpetual dialogue. History is constantly being rewritten. This might simply be due, of course, to the discovery of new evidence. But it can also result from the appearance, as societies change, of new priorities assimilated by historians and their audiences. Therefore, without endorsing outright relativism, it might justifiably be said that history is contingent and malleable. As such, there is a danger that historians’ views of what constitutes information in the past are both subjective and subject to change, thus giving rise to multiple foci. This places a premium on the information historian’s ability to identify meanings attached to information in past societies and to the practices that revolved around it.<sup>8</sup> Given that information historians are sensitive to the temporal and cultural deviations in the definition of information, they are perhaps more aware than most of the heresy of anachronistic analysis. The analogy depicting the nineteenth-century electric telegraph as the “Victorian Internet” is a prime offender in this regard, in that the telegraph was for the most part an exclusive, elite, speciality service, whereas the World Wide Web (as opposed to the internet) was from the outset in many respects a mass, popular technology.<sup>9</sup>

We should remember that information history is, first and foremost, a subfield of history. As such, information history is aligned with developments in the discipline of history itself. In terms of method, this means that information historians should be expected to employ the same rigour applied by any serious historian to situate and understand their subject matter, avoiding anachronistic interpretations in the process.<sup>10</sup> In terms of scope, it means that information history can be, and has been, explored in an expanding variety of contexts, from colonialism and slavery to gender and class. Brendecke, Friedrich, and Friedrich situate the historical study of information pragmatically, arguing that information is always defined with reference to a given purpose.<sup>11</sup> Context is fundamental to the way in which we interpret that which is called “information” in any given situation. As Alistair Mutch has put it, “what is of central importance is the role of context in aiding, changing, or distorting the meaning of information.”<sup>12</sup> This *Handbook* does exactly that. Each chapter attempts to situate information within a specific milieu. Each interpretation is inevitably differently nuanced; taken together, the overall result is a kaleidoscope of information practices—including their uses, roles, and effects—over the past two thousand years or so. There is no reason, of course, why attention could not also have been given in this volume to information in even more distant periods of history.<sup>13</sup>

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The discussions in this *Handbook* proceed according to two basic assumptions regarding the meaning of information. The first assumption is that practices of information develop out of the sharing, or transmission, of knowledge. Knowledge resides exclusively in individuals' minds, and once communicated, it becomes information. In other words, released from the mind, knowledge takes on an informational form. The second assumption is that this sharing, or transmission, requires external representation—from sound or speech to digital encoding and more—and involves a wide range of practices.<sup>14</sup>

### **The Danger of Information History as the History of Everything**

William Aspray has observed that information history has as many definitions as information itself.<sup>15</sup> While acknowledging the validity of this observation, we are not tempted to go further and adopt the view that information can be anything or everything. Such a position would be ahistorical, unhelpful, and opaque. We recognise that there is danger in attempting to pluck an information dimension from *any* past human activity.

A recent acute study of information in the work of the nineteenth-century realist novelist Charles Dickens illustrates the potential pitfalls in perceptions of information history becoming too broad.<sup>16</sup> Dickens' *Little Dorrit* (1857), for example, occasionally references certain obvious information practices and formats, including song lyrics, letters, posters, and testimonials. However, the study's main focus is the positing of realist novels of the past as part of information history because of the way they collect, interpret, and transmit information about the time and place in which they were set and created. Realist novels contain, the study explains, information about contemporary material conditions and institutions as well as social values, behaviour, perceptions, and identities. *Little Dorrit*, like other realist novels, is viewed as an "information system" because it describes how all individuals and institutions were "subject to corruption in familial, romantic, and social relations; philanthropy; investment practices; medical care; legal disputes; and government bureaucracy."<sup>17</sup> Arguably, however, most historians would see these attributes of the realist novel simply as primary-source evidence. Similarly, the claim that information in the realist novel includes "the way the story is told, by whom, in what order, and according to what structure or pattern" would generally be considered, it might be contended, to lie firmly within the bounds of literary criticism, a long way from the realm of information history.<sup>18</sup>

In some quarters, information—and, it follows, its history—has been viewed as physical, in terms of its very nature as opposed to the means of its transmission. In genetics, DNA has been viewed as information. James Gleick has reported this perception thus: "Genes encapsulate information... The body itself is an information processor. Memory resides not just in brains but in every cell ... DNA is the quintessential information molecule."<sup>19</sup> Such a view is based on the general perception that every physical thing is "information-theoretic" in origin. As such, the universe can be seen "as a computer—a cosmic information-processing machine."<sup>20</sup> In astrophysics, a debate has been running over recent decades between those who on the one hand believe information, at the level of the sub-atomic particle, evaporates after entering a black hole and those who on the other hand argue that the laws of quantum physics do not allow for its disappearance.<sup>21</sup> Clearly, in this book, we are not concerned with matters of this kind—that is, with grand conceptualisations of information as the flywheel of the evolution of life or of the fundamental physics of the universe; and nor, it follows, of the (natural) history of the operation of this flywheel, or the history of research into it. Our interest is in the history of information practices rooted in the culture of the human species.

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Some information practices are situated, it might be contended, in a grey area between information in everyday life as a legitimate historical category and information as the history of everything. Gossip is a good example in this regard. In the minds of some historians of information, gossip may not have been seen as technical enough to prompt serious historical study. However, the topic has registered a significant presence in social history in recent years.<sup>22</sup> Beyond being an entertaining pastime and a form of sociability, gossip has been shown to be a source of information.<sup>23</sup> Historically, this has been the case not only in mundane, everyday settings but also in contexts of great importance, such as in eighteenth-century revolutionary France, in which a semi-literate public sphere operating on street corners and in coffee shops—an information society of gossip—has been identified by Robert Darnton.<sup>24</sup>

Evidence from Norman Lewis' first-hand account of life in a remote Spanish fishing village shortly after the Spanish Civil War would arguably be of value to the information historian.<sup>25</sup> The inhabitants of the village had little interest in the outside world, but lively interchanges on village happenings, especially among the women mending fishing nets, were commonplace. "Net-mending was a wholly mechanical procedure, leaving the brain to create its own fancies, and to work on the raw material of speculation and known fact from which the tissue of gossip was woven," the women engaging in the activity later passing on newsworthy gossip to their husbands, thereby forming a "circuit of information" in the village.<sup>26</sup> Similar informal information exchanges might be identified in the practice in the homes of gentlemen in Georgian London of posting satirical prints on the walls of rooms, with the layers of innuendo, political suggestion, and social and cultural references being unpicked by those who examined them over drinks and conversation.<sup>27</sup>

However, there are perhaps methodological dangers inherent in pulling such everyday behaviour into the realm of information history. The risk of information history spinning out of control because of the width of perception that researchers—and readers indeed—might have of it is very real. This is where the methodological training and the sensitivities of the historian come into their own, offering structure and a framework to the vast avenues of potential information research on past societies. Attempts to excavate informational meaning from everyday technologies and social forms of the past—from architecture, design, and fashion to bodily gestures, fiction, and film—as opposed to discretely observed information practices run the risk of diluting or undermining authentic studies in information history. As Sheila Ritchie observed in citing examples of "messages" conveyed by smell and sight, it might be supposed that "anything contains information and information may relate to anything," thereby dictating, ludicrously, that the history of information can be the history of everything.<sup>28</sup> Yet, a field of history can only function effectively if it has recognisable boundaries. If the boundaries of information history become too elastic, it might be argued, then there will be a price to pay in terms of disciplinary coherence and legitimacy. This said, it would be remiss of information historians to ignore the move in history over recent decades towards an embracing of the "commonplace."

### **Content and Approach**

To develop a comprehensive historical account of information and its practices as they emerged over time and in all their different contexts would be a daunting task. Our approach instead is to offer, mostly, investigations of particular instances of information practice and their contexts. These range from information in the Roman Empire, to the role of homing pigeons in military matters since classical antiquity; from information and the politics of

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communication in the early modern city, to the role of women in the late twentieth-century software industry. Such explorations thereby provide the reader with the opportunity to reflect on similarities that might emerge when following the trail across multiple terrains.

A number of contributions explore how historical actors across the wide scope of this *Handbook* grappled with the notion of information itself, whether or not they had yet given the concept a word. It has not been our intention to present overviews, or broad surveys, of the various aspects of information history, according to what some might consider to be the traditional role of a handbook (although a small number of chapters *do* comply with this role). Rather, illustrative of the fact that information history is a wide intellectual domain not easily sliced into predictable chronological or thematic categories, the *Handbook* generally offers in-depth “empirical” chapters that focus on specific examples and contexts. Conducive to this depth of analysis, chapters are richly referenced, including with archival sources (many of them from non-English language repositories), thus reflecting the quality of scholarship contained within the pages of the *Handbook*.

Although the study of information technologies has a place in information history, contributors have been assiduous in emphasising the conditions of the emergence and deployment of such technologies: their social milieux and their consequences, as well as the practices of which they are a part. In addition, contributions focus on *information* rather than drifting into the realm of *knowledge*, the history of which is a related but separate field. Information history shares many objects and sites of investigation with the history of knowledge—indeed, many practices of information can be also considered practices of knowledge. In addressing the overlap between information and knowledge in the context of history, Peter Burke sensibly reminds us that: “Both terms are useful, especially if we distinguish between them.”<sup>29</sup> Regarding the distinction, it could be argued that whereas the history of knowledge emerged from the history of science and may therefore be haunted by certain kinds of canonical knowledge, information history may largely be described as domain-agnostic, being not necessarily committed to any particular subject area. Thus, even though information history and the history of knowledge take inspiration from each other and are both relatively new ways of thinking historically, they generally address different areas of research.<sup>30</sup>

The primary purpose of a handbook is to bring the erudition of a field together—to create an overview of the subject, although not one that is necessarily comprehensive or encyclopaedic. The co-editors of this volume have each contributed to the growing body of scholarship in information history over the years and have aspired in this *Handbook* to offer a sense of the field’s grand possibilities: we highlight the field’s expansive variety of themes and topics as well as the diversity of scholars working in it. We have made efforts to be inclusive of global content and to offer a healthy representation of scholars from around the world. The result is a broad narrative of information and its practices—one that is indicative of the many ways in which information can be explored as a category of historical enquiry—from antiquity to the modern day, including what can be classed as contemporary history. Contributions offer the reader numerous ways to understand the links between our information pasts, presents, and futures.

### **Key Episodes in the History of Information: A Historiography of Revolution and Rupture**

If you think the information surge of the late twentieth and early twenty-first centuries is intrinsically something new, then you might wish to think again. In recent decades, historians

have been lining up to identify critical developments, marked phases, and epoch-making watersheds in the history of information and its technologies. The slicing of the past into manageable chunks is a common practice among historians. However, periodisation can be seen as contrived and problematic. The major epochs imposed on history might be viewed as a series of cycles, not purely repetitive in their precise nature but replicating each other in terms of the grandeur of their impact, the general perception that they have moved society forward and the frequent identification of them as having been ignited by a rupture moment—moments that are generally followed by after-shocks (it is, of course, often easier to identify a departure point in a period or cycle than a point of completion).<sup>31</sup>

Notwithstanding these complications, in surveying the landscape of information history, it is evident that a rupture mentality—more often than not sculpted by technological change or mirroring familiar, staple eras of historical periodisation—has become a major organising principle.<sup>32</sup> An example of investment in this mentality is offered in the work of Judith Flanders who, in discussing alphabetical order as humanity's default method over the centuries for sifting, filing, and finding information, has observed that historians have been keen to identify “key moments” in the history of information, such as “the invention of writing, of double-entry bookkeeping, printing, the telegraph, and the computer.”<sup>33</sup> The concept of the “information revolution”—the critical development, phase, or watershed moment—has generated a vigorous discourse of rupture.<sup>34</sup> “Rupture talk,” as conceived by Gabrielle Hecht, Bruno Latour, and others, largely revolves around the shift from pre-modern to modern social arrangements and ways of thinking, in that we retroactively imagine a fissure in history which divides our orderly and rational modern selves from the supposed chaos of the pre-modern.<sup>35</sup> This might be seen as a “fabrication” which serves to convince and console ourselves that we are more organised, efficient, and progressive—essentially “better”—than our pre-modern progenitors.

Two points immediately spring to mind here. Firstly, even if one were to endorse the notion of rupture, it could be argued that there is no particular reason fractures other than that between pre-modernity and modernity—including fractures in the long history of information—should not be considered.<sup>36</sup> Secondly, continuities should not be overlooked. For example, the long history of capitalism, including the information practices that are woven into it, pre-dates the perceived emergence of modernity. Further, it has been observed that key elements of modernity itself, not least a belief in the efficacy of, and an investment in, sophisticated systems of information, previously non-digital, have survived into our supposedly post-modern age.<sup>37</sup> Even in the context of a relatively niche aspect of the history of information like information policy, an awareness of continuities is important. Today's information policy domain has its prefigurative antecedents—from surveillance, information privacy, and personal identity to intellectual property, information access, and issues of fake news.<sup>38</sup>

Certain events, technologies, and transitions have come to dominate the historiography of information rupture.<sup>39</sup> Whereas the origins of language continue to be debated, greater consensus exists concerning the origins and early history of writing.<sup>40</sup> Early writing devices, including writing boards and wax and clay tablets, were used not just for recordkeeping but also for scholarly activity. However, humanist scholarship, it is held, did not *take off* (as opposed to first appearing) until the broader adoption of papyrus, parchment, and paper, and the writing formats expedited by these materials. Although paper was likely first manufactured in ancient China, the papermaking techniques that were implemented in the Christian West had been refined and transmitted by the Islamic world, a development



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that facilitated a wider dissemination of information from the mid-fifteenth century onwards in combination with the printing press.<sup>41</sup>

The growth of a more literate—and thus very early information—society in the Middle Ages, alongside an expansion of economies and trade, is said to have been one of the causes of the inception and flourishing of printing in Europe.<sup>42</sup> The late Middle Ages witnessed an intensification of state power, in part owing to an increase in information control by local and—eventually and increasingly—central state agencies and laws.<sup>43</sup> The increased information protocols and procedural formalities of governance were reflected in Baldassare Castiglione's *The Book of the Courtier* [*Il Libro del Cortegiano*], published in 1528.<sup>44</sup> A courtesy book (a book of manners), *The Book of the Courtier* was essentially an information protocol aimed at guiding individuals through life at court. It was a precursor to later protocols, including directives for clerical workers in a maturing capitalism; the consolidation in 1847 of the myriad of rules and regulations relating to the operation of Britain's Victorian Poor Law and its workhouses that had previously been issued sporadically; and etiquette books of the eighteenth and nineteenth centuries, designed to help citizens navigate their way through an expanding civil society and public sphere, where social friction and interaction between individuals were escalating at an unprecedented rate.<sup>45</sup>

In keeping with the argument that as civilisations become more sophisticated, they initiate and refine recordkeeping systems, many of them “official” in nature, some societies developed *quipus* (also spelled “*quippus*”)—that is, memory, or data-storage devices, fashioned from string, with knots, twists, and colour used to communicate information. There is evidence of the existence of *quipus* in ancient China and Japan, but their most documented use was in Andean South America, most prolifically in the period from the twelfth century to the middle of the sixteenth century, with a continued legacy into the twentieth century.<sup>46</sup>

In Europe at this time, information was playing an increasingly vital role in the much-debated transition from feudalism to capitalism.<sup>47</sup> This was most clearly observed in the selling of information to make a profit in the context of the rise of the new print and publishing industries.<sup>48</sup> But it was also visible in the mechanisms and processes associated with merchant capitalism, where shippers, traders, and financiers were involved in the investment of “primitive capital” designed to create profit for further investment. Mercantile Europe, especially in the Mediterranean basin, developed a number of information innovations, from the written maritime insurance contract and partnership agreement to the bill of exchange and double-entry bookkeeping. Other information objects produced by the literate and numerate merchant cultures of the time included personal memoranda books recording business accounts and family data (such as births, marriages, and deaths) as well as, occasionally, events outside the family-household sphere. Merchant advice books recorded the ethos of the pre-modern merchant. Regarding long-distance trade, manuals of commercial practices were produced: books addressing the geography of the far-flung merchant's world, “in which information useful to merchants—trade routes; distances; local currencies, weights, and measures; lists of spices and other goods; duties and tariffs; carriage costs—was compiled directly or second-hand from correspondents.”<sup>49</sup> Order in the realms of capitalist enterprise and state affairs was enhanced by the development from the late Middle Ages onwards of the mechanical clock, which might easily qualify as a historic information technology of universal importance.<sup>50</sup>

The early modern period was marked by a growing impulse to measure, classify, and collect information through observation, a development which, alongside new channels of information dissemination, such as the scientific journal and the culture of the salon,

characterised the Enlightenment and the rise of a public sphere.<sup>51</sup> Across the sciences, the Enlightenment witnessed an upsurge of interest in taxonomy, from plants to race.<sup>52</sup> An initial wave of European imperial expansion took place, in which information practices played a central role.<sup>53</sup> The early modern period also saw the emergence of the military-fiscal state, behind which the forces of “political arithmetic”—the accounting of the wealth, strength, and trade of the nation, typified by the grandest of indirect surveillance mechanisms, the census—were conceptualised.<sup>54</sup> The early modern understanding of information in Europe reflected an emerging demand for an active procurement and communication of information as a justification for decision-making in state, ecclesiastical, and learned administrations. Information, in essence, became critical to processes of rationalisation and modernisation in early modern statebuilding.<sup>55</sup> This included the cameral sciences which emerged in Northern Europe in the eighteenth century as the means of administering state economic enterprise.<sup>56</sup>

However, as if to underline the importance of structuralism in human development, the period also saw the appearance of interesting and practical information storage and communication technology outside the West. The rise of the Luba kingdom in central Africa from the sixteenth century was accompanied by the introduction of “lukasa” (memory boards and other objects), under the control of “memory men” normally drawn from the tribal social elite. Lukasa were used to record and summon up the history of royal rulers, the titles and duties of courtiers, the location of royal treasuries and religious sites, and customary provers, maxims, and songs.<sup>57</sup>

Industrialisation, commencing in the second half of the eighteenth century, involved a significant escalation in information exchange, not least via the expansion of mail services.<sup>58</sup> It also brought with it a massification of culture, whereby people became more aware of the importance of, and rights to, information. In short, “information became a public cultural commodity.”<sup>59</sup> This was a development facilitated in part by the proliferation of images in popular periodicals, such as, in Britain, *The Penny Magazine* (1832) and *The Illustrated London News* (1842), in which both fine art and contemporary illustrations were closely linked to textual information.<sup>60</sup> Chambers’ *Information for the People* (1835) was emblematic of the desire to democratise access to information. This relatively slim encyclopaedia was published cheaply and at intervals in separate parts, the work as a whole being constituted by a “series of sheets on subjects in which distinct information is of importance among the people generally.”<sup>61</sup> The marked fall in the price of paper from around the 1860s, as the raw-material base of its manufacture switched from rags to wood pulp, allowed scholars and others to cut and paste snippets of information from newspapers and journals into (often) appropriately indexed scrapbooks and albums for future retrieval and use, a practice that developed alongside a revival in the use of commonplace books. A large market developed in the sale of these basic information tools.<sup>62</sup> The middle of the nineteenth century also witnessed the arrival of a truly mass-culture information technology in the form of the photograph.<sup>63</sup>

This cultural commodification of information was matched by its commodification in production more broadly. This occurred at the most basic level of human need: employment. In Britain, the “tramping system” for union-organised and apprenticed workers developed into an information-reliant means of matching itinerant workers to vacancies—a decentralised system in contrast to the centralised information offices established in France and proposed in England in the seventeenth century.<sup>64</sup> “Tramping” from town to town, skilled workers were able to present personal documents at a designated “house of call”



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(often a public house) which would provide temporary lodging and food as well as act as an unofficial labour exchange in receipt of information about job openings.<sup>65</sup> In the United States, aside from democratising the public sphere, the expansion of the mail system—the number of post offices rose from around nine hundred in 1800 to over thirteen thousand in 1840—lubricated the wheels of business.<sup>66</sup> This efficient though pedestrian information system was then supplemented by one that provided near-instant delivery of messages. Aside from its social uses, the telegraph certainly had economic ramifications. For example, “throughput” in the Chicago meat packing industry was made hugely more efficient by the receipt of telegraphic messages indicating when deliveries of cattle would likely be made.<sup>67</sup>

In the second half of the nineteenth century, as industrialisation matured and economic activity mushroomed, the science of “systematic management,” including the management of information, emerged to cope with the increasing administrative complexities that characterised the first large corporations. “To work systematically,” declared an early treatise on factory management, “is to work successfully.” “Method,” it continued, “is the essential element on which every solid and substantial concern is based.”<sup>68</sup> The growth of “method” in corporate performance entailed not only the rise of human-performance accounting but also planned industrial research, both of which required the efficient management of information—as did the corporate regimes of Taylorist scientific management that emerged in the early twentieth century.<sup>69</sup>

This second phase of industrialisation was eventually characterised by an information, or office, management revolution that was, except for the telephone and the aforementioned telegraph, manual in nature.<sup>70</sup> Business, as well as the state, became conscious of the heightened need to undertake and manage recordkeeping.<sup>71</sup> Building on the legacy of information control that abetted early colonial expansion, the era of high imperialism before the First World War was hugely facilitated by the telegraph, characterised by Standage (although perhaps illegitimately, as argued above) as the “Victorian internet.”<sup>72</sup> Its development and global deployment was closely intertwined with the growth of European empire—“empires of cable,” to invoke Mattelart’s analogy.<sup>73</sup> Global communications were further enhanced by the standardisation of time (the establishment of international time zones) in 1884, a development which built on the standardisation of time within nations in response to the construction of extensive railway networks and the emergence of what became known as “railway time.”<sup>74</sup> Like previous imperialist endeavours, the age of high imperialism, commencing with the “Scramble for Africa,” would not have been possible without the information practices of a bureaucratic infrastructure. Because the efficiencies of this system were best exploited through direct rule as opposed to informal control, such practices thereby destabilised, and eventually destroyed, the very European empires they were meant to support.<sup>75</sup>

The “Belle Époque” decades around turn of the twentieth century were marked by a number of initiatives aimed at the universal control of information.<sup>76</sup> Following the launch in 1867 of its *Catalogue of Scientific Papers*, in 1902 the Royal Society of London inaugurated the *International Catalogue of Scientific Literature*, a large-scale, annual publishing venture aimed at tracking the circulation of print matter in the sciences, a result of the nineteenth century having seen a massive growth in scientific investigation and its dissemination, especially via the scientific journal.<sup>77</sup> In Belgium, in 1895, Paul Otlet established the International Institute of Bibliography and in doing so inaugurated a new discursive formation termed “documentation” (later “information science”) which sought to identify and classify all manner of information objects—from books, periodicals, newspapers, and

bibliographies to administrative records of government, patents, industrial catalogues, and indexes, and beyond to society's ephemera as well as new media like photographs and films—and to do this, moreover, not only at the level of the whole item but also by indexing parts, segments, or fragments of information within items.<sup>78</sup> To facilitate this, Otlet developed a new classification system, the Universal Decimal Classification (UDC), a granular adaptation of the Dewey Decimal Classification (DDC) which had been developed by the American librarian and library promoter and entrepreneur Melvil Dewey in 1876.<sup>79</sup>

Otlet's International Institute of Bibliography was restructured as a federated international association in the 1920s and renamed the International Institute for Documentation (Institut International de Documentation, IID) in 1931, subsequently renamed the International Federation for Documentation (Fédération Internationale de Documentation, FID) in 1937. Also in 1937, a World Congress of Universal Documentation was held in Paris under the sponsorship of the League of Nations. It was at this event that H.G. Wells repeated his idea of a World Brain, a new type of universal encyclopaedia, one that was exhaustive, centrally produced yet also democratic, and continually revised as a result of ongoing intellectual debate and input.<sup>80</sup> In line with these global information developments, in 1927 the International Federation of Library Associations (IFLA) was established.<sup>81</sup> Information associations also emerged at a national level. Following the inauguration of a Special Libraries Association in the United States in 1909, in Britain in 1926, the Association of Special Libraries and Information Bureaux (ASLIB) was established, aimed at representing not only specialist libraries but also the ever-growing number of intelligence and information centres in the country; meanwhile, in the United States, the American Documentation Institute (ADI) was established in 1937.<sup>82</sup> Together, these initiatives occurring in the decades immediately before and after 1900 represented something quite new: the need to construct robust systems, at global and national levels, for the management of information in the face of a widely acknowledged information deluge. Information was explicitly recognised as something to be *managed*.<sup>83</sup>

The early twentieth century saw the birth of scientific management which, due to its reliance on the introduction of new flows and analysis of information, effectively fashioned it, according to Robins and Webster, into the "original information revolution."<sup>84</sup> By the inter-war period, certainly in the United States, information had become deeply entrenched in commercial as well as in political and social life—to the extent that it has been possible to write an information history of the post-1918 world, to stand alongside traditional accounts of the period.<sup>85</sup> New public information technologies, productive of the term "mass media," began to appear. Together, the cinema, radio, television, and the gramophone, facilitated by new and efficient systems of electricity distribution, constituted a large part of what Lewis Mumford in the 1930s called the "neotechnic phase" of history, while in the commercial and state spheres, information processing was advanced by the development of punched-card and embryonic computer technologies.<sup>86</sup> The years to 1950 also witnessed an explosion in state intervention, driven by two world wars and the emergence of welfare states. This new level of intervention was underpinned by a massive expansion in the information capability of state agencies.<sup>87</sup> Information also continued to underpin the strategic and tactical concerns of *warfare* states. The world wars and the Cold War catapulted the importance of both non-digital and digital information systems in armed conflict and intelligence to new heights.<sup>88</sup>

By the last quarter of the twentieth century, the rhetoric of an "information age"—arising out of the mid-century development of the (ground-breaking) transistor, computers,

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and other technologies for signal and information processing—was becoming entrenched.<sup>89</sup> In 1948, Claude Shannon, widely referred to as the inventor of the information age, coined the term “bit” (a reduction of the term “binary digit”) to represent a fundamental unit for measuring information quantitatively, its meaning taking no account, of course, of the quality, or value, of information. The perceived originator of information theory, Shannon also published the classical model of communication, involving sender, receiver, transmitter, and, the disrupter of the signal process, noise.<sup>90</sup> By the 1950s, computing technology was being accessed by the world of business, commencing in the unlikely environment of the Lyons teashop and confectionery business in the United Kingdom.<sup>91</sup>

In 1981, the Japanese sociologist Yoneji Masuda, labelled by some as the father of the information society, looked ahead optimistically to the eventual arrival of a “computopia,” where digital technologies, underpinned by the silicon chip, would produce unprecedented levels of individual self-actualisation, education, health provision, social harmony, citizen participation, and global interdependence—in a post-materialist, post-pollution civilisation, moreover. For many, the onset of the electronic information age, where the computer made its mark on almost every aspect of human society, has trumped all previous claims to the prize of “most momentous rupture,” not only in the long history of information but also history *per se*.<sup>92</sup>

Each of these moments in the history of information—many mapping onto perceived ruptures in history at large—has in varying degrees been badged a “revolution,” heralding a subsequent “age of information,” which is furthermore typified by a sense of “information overload.” The long historical record is thus peppered with challenges related to the management of this information overload. The utility of alphabetic and alphabetic numeral ordering was debated throughout antiquity and in diverse geographical regions.<sup>93</sup> Different reference tools and finding aids were developed in universities in the twelfth century, suggesting that scholars were grappling with now-familiar information challenges, even if they did not express them in terms of an overload.<sup>94</sup> Ann Blair and others have noted that Conrad Gessner, although not using the term “information” explicitly, nevertheless complained about the “confusing and harmful abundance of books” in 1545.<sup>95</sup> Likewise, in 1685, Adrien Baillet expressed his concerns about the future of civilisation, should a plan not be developed to help identify and keep the most useful books out of the “multitude of books which grows every day in a prodigious fashion.”<sup>96</sup> The following year, John Locke devised a “New Method” for indexing material to facilitate the practice of search and retrieval, while Leibniz still indicated that he was having difficulty keeping track of his own notes in 1693.<sup>97</sup> Similar anxieties were expressed in the nineteenth century. For example, the British political theorist and sociologist L. T. Hobhouse wrote in 1896 of the “deluge of specialism” and the “mass of accumulated fact” that was affecting scientific and social life.<sup>98</sup> Such observations on the proliferation of information indicate that there is a long history of people grappling with information-related challenges, the enduring nature of which demonstrates that they cannot be uniquely associated with digital technologies.

The discourse of rupture in the context of the history of information practices is reflected in an awareness that the meanings attached to information—to return briefly to the issue of definition—have also changed over time. For example, it has been argued that the change in the meaning of “information” in the nineteenth century represents the most significant rupture, taken to mark the beginning of a conceptual change that would ultimately help reframe the modern world.<sup>99</sup> The explicit use of the phrase “an age of information” in 1853 by the London *Times* suggests a shift in how the notion of information was understood.<sup>100</sup>

In the Victorian age, what was understood as information became increasingly abstracted from context and purpose, although this is not to say that information's semantic ground did not move according to the context in which the term was being used.<sup>101</sup> According to Neil Postman, in the eighteenth century, information was not thought of as a commodity to be bought and sold; rather, it was thought to have worth only if embedded in a context, thereby carrying the potential to shape political, social, and scientific concepts. What changed this perception, Postman posits speculatively, was the advent of the electric telegraph, which rendered information desirable in itself, an entity (thing) separate from its possible uses and meaning.<sup>102</sup> Previously considered inextricable from its particular use and context, "information" from the nineteenth century onwards began—whether or not exclusively due to the arrival of the telegraph—to be constructed increasingly as something discrete, corpuscular, and morselised, often with an immediate functional utility and value, moreover.<sup>103</sup>

The essence of the nineteenth-century re-orientation of the understanding of information was captured by Charles Dickens in his novel *Hard Times* (1854), a depiction of life in the imaginary industrial settlement of Coketown. In that "severely workful place," wrote Dickens, all civic institutions and public inscriptions appeared austere. In their appearance, Dickens' imagination projected, the gaol might have been the infirmary, the infirmary the town hall, the town hall the gaol. Mirroring the perceived utilitarian value and morselised nature of information that the industrial age had reinforced, everywhere in the barren landscape of Coketown and in its culture Dickens noted an evocation of the rule of "fact, fact, fact." Even the design of the local school was "all fact," he wrote.<sup>104</sup>

### **Witting and Unwitting Information History**

Much can be learned about information and its practices in histories that do not wittingly set out to address either; it would be fair to say that most information history is not undertaken by scholars who would claim, in the first instance, to be an information historian.

Geoffrey Parker's analysis of the life and foreign and domestic strategies of Philip II of Spain (reign, 1556–1598), dubbed the "Paper King," provides a good example of unwitting information history.<sup>105</sup> Parker's account contains a sprinkling of references to the monarch's intense daily bureaucratic practices. A micro-manager, Philip attempted to govern the expanding Spanish world with his pen. The thousands of papers, which he called his "devils," that at any one time confronted him drove him to despair. To reduce the information overload he was experiencing, Philip eventually instructed secretaries, as well as a committee of senior ministers, to write summaries of long letters and reports, though to what effect is unclear. These information aspects of Philip's life appear sporadically in Parker's lengthy text. This merely occasional referencing is not surprising, as Parker did not set out to write an information history of Philip II. Evidence of information practice is overshadowed in Parker's book by much larger matters of imperial expansion and international rivalry. To retrieve an information-history perspective of Philip II's life, one would need to read between the lines and against the grain of the overall discussion, excavating an information discourse from a forensic reading of Parker's text. By contrast, Paul Dover has produced an account of Philip's life with an explicit information-history focus.<sup>106</sup> Philip's failures as a person and as a monarch were in some part, argues Dover, caused by a crushing, self-imposed information overload. His pre-existing obsessive personality only aggravated the overload, acting as an obstacle to optimal decision-making. Philip II's insatiable desire for

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information in advance of committing to a course of action meant that decisions were delayed, resulting in disadvantageous outcomes. In focusing on such issues, Dover is wittingly engaging in information history.

A similar example illustrative of unwitting and witting information history operating side by side, although in this instance in a single text as opposed to across a single subject, can be seen in the “social arithmetic” and “social knowing” connected with the Victorian city, which Martin Hewitt has explored in the context of Manchester.<sup>107</sup> In the new urban areas of the industrial age, against the backdrop of problems wrought by the shock of industrialisation, there was a growing interest in, and practice of, surveying the population with regard to life-chance matters like health, poverty and housing. The production of social knowledge in this respect was accomplished through a combination of the new statistical movement, the deployment of cartographic imagery, and a “visiting mode” of direct surveillance of households conducted by clerics, philanthropists, representatives of charities, and a growing cadre of experts and officials. Hewitt explores the ways in which a particular set of investigative practices structured how knowledge was collected, conceptualised, and communicated. This required analysis of observed information, out of which knowledge was produced, as well as of the information technologies deployed to record and disseminate data, including journals, surveys, and maps.<sup>108</sup> There is much in Hewitt’s study, therefore, which speaks to the concerns of information history. Information and various of its homologues—facts, investigation, statistics—pepper the discussion. Ultimately, however, the information dimension in the study is subsidiary to the focus on “knowing.” Arguably, an undisputed information-history approach to examining the production of social knowledge in the Victorian city, which was obviously not Hewitt’s primary concern, would have called for the *principal* focus to have been on the details of such things as the methodologies of accumulating data; aims and parameters set in advance of investigation; methods of data collection, processing, and analysis; the possibility of bias and presumption; and avenues and tools of dissemination.

For those with a primary, self-conscious, witting interest in gathering evidence of information history from a study such as Hewitt’s—a study which does not primarily set out to bolt its subject in an information-history framework but which succeeds in offering information-history evidence—it is again, as with the example of the life of Philip II above, a matter of being prepared to identify evidence at variance with the primary narrative and to dig data out at intervals from accounts that at first glance do not appear to have much of an information complex. Information historians should, therefore, aside from conducting their own primary-source research, be sensitive to the existence of evidence in secondary sources not intentionally crafted as information history. By looking under the surface and asking relevant to their purposes, the witting information historian can also gain new insights from conventional historical narratives.

Beyond the numerous examples of unwitting information history one could cite, where information practices are embedded in historical explorations of primarily non-information themes, there has been an expanding circle of historians who consciously take up information as a particular focus or path. In this regard, our *Handbook* is testament to the maturity of the field, and a recognition of the volume and multitude of scholars around the world working on the historical study of information. There has been a steady rise of interest in information history over the past quarter of a century, while recent years have witnessed a surge in publications. Some of these witting information-history studies have been empirically specific, focusing on a particular geography or temporality.<sup>109</sup> Others,

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more comparable in structure to this *Handbook*, are the numerous edited collections which focus on specific information themes.<sup>110</sup> Many come under the aegis of “information and the individual,” or the history of census information.<sup>111</sup> Specific, and eclectically themed, information history has included the study of the deliberate destruction of information repositories throughout history, the history of the filing cabinet, and differing perspectives on the information history of the First World War, while other scholars have made a strong link between information and technology.<sup>112</sup> This scholarship, across multiple disciplines, that has wittingly engaged in developing histories of information has led to a coalescing of interests that might now demand the formal recognition of a discrete field called information history. But what are the possible origins of this emergent field?

### **The Emergence of Information History**

*The Routledge Handbook of Information History* forms part of an ongoing and dynamic exploration of the many histories of information, but untangling the complex roots of information history as a field is a challenging task. Against the backdrop of the rise of digital technology in the late twentieth century, scholars from multiple enclaves of history began to examine earlier developments in the circulation and organisation of information. Related topics were also explored by those outside the history discipline, including in sociology, media and communication studies, linguistics, and semiotics. However, none of the research in these areas has explicitly referred to the arrival of a new history of information, nor has there been a concerted effort to develop an information history “college.” Such efforts *have* been evident, however, in the discipline of the information sciences, most notably in connection with history-focused scholars in the related fields of library, archival, and information science.

The history of the book is one of one of the subfields of history which has supplied useful contributions to the development of information history.<sup>113</sup> Any authoritative field that takes information as its focus would need to address changes in the provision of information, whether they be brought on by changes in literacy, or rhetoric and composition, or manuscript, printing, and digital technologies, each of which is of interest to historians of the book. To take the example of printing, the rise of the printer’s workshop in Europe in the fifteenth century alongside the traditional copyist’s desk offered a different set of possibilities for the dissemination of information.<sup>114</sup> Some scholars working in the history of the book have explored the effect of different communication technologies on cultural production.<sup>115</sup> In terms of grappling with developments relevant to information history, one of the major consequences of the adoption of the printing press in Europe was the boost it gave to scientific and technical literature, where synergies exist with the practical and applied dimensions—the tangible products—of information.<sup>116</sup> Printing technologies were leveraged to facilitate the development of common objects of study, accelerating the harmonisation of scientific practices that was already taking place. As historian of science Lorraine Daston notes, standardisation, another facet of information practice, “is a prerequisite for a shared world.”<sup>117</sup> An example of a common (if not yet standardised) practice in the context of book history is the strategic use of blank space as a technique for organising information since antiquity; as a tool for segmenting text to facilitate navigation, such division chimes with the sense of information which revolves around its morselised, corpuscular nature.<sup>118</sup>

A feature of Daston’s “shared world” of printed texts was the growth of digestible reference works, often practical and technical in nature—and therefore of great interest to



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those studying information history.<sup>119</sup> Early printed manifestations of this were medical almanacs, prognostications, calendars, practical books, devotional books of hours, and basic school texts and guides.<sup>120</sup> Thereafter, books for the management of daily life became popular—cheap, small-format texts for the non-specialist on matters ranging from cookery, food preservation, sewing, and gardening, to diet, general medicine, and animal husbandry.<sup>121</sup> By the eighteenth century, numerous compendia were in circulation, including encyclopaedias and dictionaries, as well as directories, stagecoach schedules, and a variety of other reference works.<sup>122</sup>

Another line of exploration that informs today's discourse in information history can be traced back through the domain of sociology.<sup>123</sup> Specifically, a lineage can be identified in that history-inflected segment of sociology which from the 1960s was concerned with the question of the emergence of an “information society” as a major break, or discontinuity, in history.<sup>124</sup> Exploring the concept of the post-industrial society, the precursor of the concept of the information society, scholars were naturally prompted to examine certain characteristics of industrial and pre-industrial history. While not delivering detailed information-history accounts of pre-information societies, there was a firm recognition of the role played by information practices throughout history. Pointing out that information had always been a factor in economic life, in the 1960s Alain Touraine argued that in post-industrial society, information had by then become much more closely bound to the realm of production, a lack of access to information forming the new basis of alienation.<sup>125</sup> For Daniel Bell in the 1970s, information was central to the major transformations, or new “axial principles,” that had been occurring in advanced economies in the immediately preceding decades—these principles being shifts from manufacturing to services; from traditional elites to a new class of knowledge or information experts; and from technical-based production to science-based industries where the codification and testing of theoretical knowledge reigned supreme.<sup>126</sup> Labelling the new, post-industrial information age “The Third Wave” of civilisation, following upon the first wave of agricultural society and the second wave of industrial society, in 1980 Alvin Toffler explained that all societies have constructed an “info-sphere” of some description, for producing and distributing information.<sup>127</sup>

Such studies, which emphasised that the information society emerged from industrial society, laid the ground for research on the manual information-management revolution in the decades immediately preceding and following the First World War. Much of this research emanated from the worlds of management theory and organisational sociology, with historians associated with, or close to, these areas working on topics revolving around the bureaucratisation, or informatisation, of the first large-scale capitalist industrial and commercial enterprises, which began to emerge in the second half of the nineteenth century.<sup>128</sup>

As the digital age gained momentum and the notion of an information society became embedded in both academic and popular vocabulary, history-minded scholars in communication and media studies began to show a keen interest in the concept of concept of information.<sup>129</sup> In their expansive social history of the media, Asa Briggs and Peter Burke locate their work in the history of “the communication of information ... by means of speech, writing, print, radio, TV and most recently the internet.”<sup>130</sup> Such social history built on the subject matter that in 1964 Marshall McLuhan—who during the much cited communications revolution of the time had invested innovatively in the term “age of information”—had deemed worthy of research and analysis: anything from computer automation, television, radio, the movies, the telephone, and clothing as signification, to the telegraph,

the typewriter, the record player, advertising, the press, the photograph, comics, clocks, and transport and trading routes as information highways.<sup>131</sup> Many of these topics would be prime candidates for inclusion in any expansive study of the history of information.

Although many scholars in the areas discussed above displayed an energetic involvement in the study of information, they did not concern themselves with generating a discrete field of information history. That development occurred in the information sciences, a disciplinary constellation that takes as its primary focus information and its practices and technologies. The information sciences domain is populated by a large number of fields and associated professions, from archival science, museum studies, and library science, to records management, knowledge management, information management, information systems, and computing.<sup>132</sup> Many of these fields developed a historical identity and college. It can be argued, in fact, that some of the deepest foundations of information history can be located in investigations revolving around the origins of the various fields that have made up the information disciplines and professions; any discipline, or profession indeed, that claims such a status must be able to summon up a history.<sup>133</sup>

In the popular mind, the history of computing might be understood to be synonymous with the history of information. Historians of computing have been naturally drawn to the concept of information, not least with regard to the history of information processing, of the computer as an “information machine.”<sup>134</sup> One scholar in the history of computing has gone further, explicitly acknowledging the relevance of a “history of information.”<sup>135</sup> Efforts have also been made to historicise information systems, these being practices associated with the adoption and operation of informational technology, as well as of soft systems, mostly in organisational and institutional settings.<sup>136</sup> Media archaeology has echoed the importance of information through explorations of technological devices.<sup>137</sup> Scholars in the archival sciences, because of their proximity to the history discipline, were attuned to historicising archives and archival practices, as well as the archival profession itself.<sup>138</sup> Furthermore, it is not surprising that the history of archives, being closely associated with the history of information management as well as of paperwork, scholarship, and the document as media, adopted an information vocabulary.<sup>139</sup> Similarly, the history of state record-keeping activity has also been infused with the concept of information, the modern state being essentially a bureaucratic, information system, perceived reductively as an “information state.”<sup>140</sup>

Located within a larger domain of the information sciences, history-minded scholars in the subfield of information science (termed “documentation” in Europe) became highly active in exploring the field’s origins and antecedents.<sup>141</sup> In many ways, these scholars paved the way for the emergence of an information-history domain.<sup>142</sup> However, partly because they were often focused on particular technologies and techniques, their primary concern was not an engagement with the broader conceptualisation of information history, which naturally feeds heavily off social and cultural history. Nevertheless, it was a short leap from research on the history of the subfield of information science, and of the discipline of the information sciences more generally, to an acknowledgement of the historical importance of information in society generally. This was especially true with regard to the amalgamated field of library and information science (LIS), which—in the United States—frequently incorporated the field of archival studies. In the late twentieth century, the teaching of information society studies, including historical perspectives, became firmly embedded in LIS.<sup>143</sup> This served as a powerful catalyst in the development of information history as a discrete area of historical research. Also influential was the long tradition of research on the history

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of libraries and library science (or librarianship), which acted as a springboard into the history of information, as the library profession increasingly sought to modernise itself by adopting an information-focused language and identity.<sup>144</sup>

It was scholars attached to the relatively small and humble discipline of LIS, therefore, commencing with the work in 1986 of the American librarian Norman Stevens, an early advocate of computer technology in libraries, who began to theorise and promote information history.<sup>145</sup> Moreover, in developing the area, purposeful attempts were made to guide scholarship toward the robust methodologies employed in “conventional” historical investigation. Thus, whereas the emergence of information history as a distinct intellectual domain had numerous ingredients, it was in LIS that the crystallisation of the subject eventually occurred, with a small group of history-focused scholars—largely working independently of each other but sharing a commitment to the study of information—breaking new ground over the past quarter of a century.<sup>146</sup> We, the editors, count ourselves in that number, each of us having experienced, or continuing to experience, the world of LIS in our academic careers.

### **The Value of Information History**

No historical field, no sub-discipline of history, can form or thrive without a recognised value being attached to its existence. So, what might be the value of information history, beyond an acceptance that it shares all the “uses” attributed to history generally?

Regarding the instrumental value of history to the present, historical approaches to the phenomenon of information can lend perspective to such matters as today’s widespread digital surveillance and reliance on data science as an explanatory device. As digital information technologies continue to be promoted as the dominant driver of social change, it is all the more important that we consider how to view and understand this broader phenomenon by historicising information, especially pre-computer information practices. Given the hype associated with the notion of a digitally induced break in history, it is part of the mission of information history, with its emphasis on culture, to challenge the technological determinism that has fostered the epochal “rupture talk” enshrined in terms like the “computer age,” “information age,” and “information society.”<sup>147</sup> Information history forces us to see the larger and longer trends of human social development. Information is not a phenomenon privileged to the modern period. The “information age” is not a singularly modern phenomenon. With regard to information, people have been grappling with questions of meaning, organisation, collection, protection, privacy, and access since antiquity. But in the late twentieth century, information became, as John Durham Peters has put it, the “omnipresent new idol,” the concept of progress having been, as identified by John Roberts, the all-pervasive idol of the age of the Enlightenment.<sup>148</sup> As an antidote to digital-age idolatry, information history contributes to scepticism regarding the millenarianism and utopianism surrounding the information society proposition.<sup>149</sup>

This said, as time advances, digital information practices will increasingly feature as the subject of historical study, not least in terms of the emergence of a whole range of new information professions or of changes in the nature of existing professions where the presence of an information identity becomes more important. The same goes for society generally. As information practices become more ubiquitous, they will increasingly prompt historical investigation. Thus, we see that digital materials, databases, the internet, and social media have already become subjects of historical enquiry.<sup>150</sup>

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Information history reinforces some of the exciting developments that have occurred in the world of history over the past half-century or so. Information history contributes to the study of history at the micro level, thereby enhancing the “new history,” a more textured history that stresses the importance of the everyday over the history of elites and great events. Information history challenges historians to consider the diversity of their source material and to think about the (in)tangibility of information preservation, dissemination, and access, not only in terms of historical documents but also in terms of how historical contemporaries considered and managed these things day-to-day. Historians are of their own time and ask questions accordingly. Finally, linked to these fresh developments in the world of history, because all sections of society have engaged in information practice in one way or another, the opportunity arises to study groups previously hidden from history, thereby investing in the “history from below” methodology.<sup>151</sup>

### **The Value of the *Handbook***

Continuing this democratic line of thought, because information has had so much to do with authority and privilege—the recordkeeping and information systems deployed by states, businesses, and social elites being the most visible—there is a risk that explorations of information “pasts” might offer limited insight into histories that have been traditionally underrepresented. However, our focus on *practices* of information—and, by extension, the people engaging in them and their complex relationships with power—permits a wider inquisitive net to be cast. Some chapters in the *Handbook* demonstrate how practices of information are implicated in questions of gender, colonisation, and emancipation. Meanwhile, other chapters explicitly examine the contributions of, for instance, women in information work, including the role of women in the development and deployment of computer technologies and in archive work, thereby raising questions related to the gendering of certain information practices and the resultant tendency to characterise some such activities as mundane and others as revolutionary.<sup>152</sup>

Our *Handbook* aims to set the foundation for further reflections on the nature of information by exploring how a variety of historical actors have engaged in its practices. These practices involve the collecting, expressing, organising, and sharing of information, as well as activities related to search and retrieval. Different tools and techniques have been used to facilitate these efforts, from slips of parchment to homing pigeons to natural language processing. The dizzying array of approaches—evident across time periods, geographical regions, and context—points to enduring questions about the management of information. Although the notion of information is often taken as a ubiquitous or even defining feature of the modern world, some scholars have suggested that the activities related to it are not only learnt but also “instinctive,” and therefore endure across time in all human societies.<sup>153</sup> Indeed, the chapters in this *Handbook* illustrate how humans have been carrying out different practices of information for millennia. The chapters in this volume not only aid an exploration of the myriad ways in which these practices were executed, but also provide a foundation for scrutinising the social, political, and economic conditions that continue to give rise to the conceiving and constituting of “information” as a particular kind of problem that is amenable to—and appropriate for—control.<sup>154</sup>

This collection moves across borders, communities, and time periods, but always keeps information in focus. All the chapters in the *Handbook* are connected by the idea that information is, and has been, textured in its meaning, and is therefore impossible to separate

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from historical context. By traversing these diverse chapters, the reader may begin to develop an enriched sense of what can “count” as information, as well as how and why some versions won out over others.

### **The Organisation of the *Handbook***

Acting as a grand narrative of the history and historiography of information, as well as having addressed certain methodological issues associated with information history, this *Introduction*, which forms *Part 1* of the book, situates the chapters that follow within the broader context of the field.

A large and diverse collection of chapters such as this could be organised in any number of ways. The chronological, geographical, and thematic divisions that are conventionally used to arrange historical studies were deemed unsuitable for a project that specifically sought to examine the highly variegated role of information across such categories. An alternative, less traditional organisation has thus been designed, reflecting our commitment to understanding the complex nature of information practices through time. The central three *Parts* of the book are focused on particular groupings of activities that, gathered together, provide a sense of the many recurrent ways of addressing information in human life.

The chapters that form *Part 2: Visualising, Describing, Expressing* explore ways in which information has been expressed, from antiquity to the twenty-first century. From the scratches on ceramic fragments, to the colours and twist direction of cords on a khipu, to biometric data, our contributors highlight a diversity of approaches for making information visible. Studies in *Part 3: Managing, Ordering, Classifying* investigate issues related to the handling of information, such as how it has been weaponised in times of conflict to generate intelligence, enhance communication, or monitor public attitudes. In addition, we see that information has always been used to govern urban spaces and reorder society, no matter what technologies and techniques were to hand. How sharing information can function to build networks and regulate behaviours is explored in *Part 4: Circulating, Networking, Controlling*. Chapters arranged under this rubric examine the workings of various systems of information exchange. They shed light on different political agendas that motivate practices of dissemination, as well as on important discrepancies of power, thereby enriching our understanding of what is now commonly called “access.” They also raise questions about what kind of information is prepared for transmission—and in which ways. Finally, in *Part 5*, the *Afterword* offers not a conclusion but a critical mandate on why we need information history; what is it ultimately *for*?

Naturally, any single chapter can lay claim to more than one of the themes outlined above, as well as, indeed, to themes that have not been stated. This is a reflection of the ubiquity of information practices. The intrepid reader may find that there are unusual conceptual connections to be made, or threads to be followed, throughout the volume. For example, the human body appears as a site of datafication—in racialised advertisements about slavery in the eighteenth century, as well as in facial-recognition technologies. The body as an analytical category is also evident in discussions of the sensorial aspects of information exchange, in medieval documentary practices as well as the hawking of early nineteenth-century street ballads. The entwined relationship between bodies and objects—and tactility and materiality—can be observed in the handling of homing pigeons and microfilm as well as paper slips, ledgers, catalogue cards, and other paraphernalia of classification. Discussions of colonial bureaucracies, anti-colonial communications, and the operations of the Dutch

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and English East India Companies may foreground the idea of an information machine, with implications of standardisation and systematisation. Despite what might seem to be a shift towards mechanism, however, the human spirit retains a strong presence in many of our studies, as in the case of the use of information as a tool for liberation throughout centuries of South African history, or in the appeal to the emotions embedded in the history of attack journalism or in the instinctive drive to *remember* in researching a family lineage.

Such threads are woven across temporal, spatial, cultural, and intellectual categories, as well as the alternative themes we have identified, and tie together the different *Parts* of our volume, demonstrating the ways in which information practices are interlaced throughout history. The concepts and interpretations expressed in the themes and threads of this collection form a richly patterned tapestry that, as a whole, creates opportunities to challenge pedagogic thinking and scholarly discussions about information history itself, if not information *per se*. Thus, this *Handbook* should be read not only as a collection of discrete chapters, but also as a way of shaping crucial disciplinary conversations and the broader narrative of information history.

## Notes

- 1 Norman Stevens, “The History of Information,” *Advances in Librarianship* 14 (1986): 1–48, appears to have been the first to use the term in a scholarly context. Toni Weller, ed., *Information History in the Modern World: Histories of the Information Age* (Basingstoke: Macmillan, 2010) uses the term “information history” in its title but contains only around a quarter of the chapters presented in this volume. William Aspray, ed., *Writing Computer and Information History: Approaches, Connections and Reflections* (Lanham, MD: Rowman and Littlefield, 2024) also uses the term, the collection numbering around a half of the number of chapters presented here. Extensive collections that address the history of information but which *do not* contain the term “information history” in their title include Ann Blair et al., *Information: A Historical Companion* (Princeton, NJ: Princeton University Press, 2021); Eric Hayot, Anatoly Detwyler, and Lea Pao, eds., *Information: A Reader* (New York: Columbia University Press, 2021); Michele Kennerly, Samuel Frederick, and Jonathan Abel, eds., *Information: Keywords* (New York: Columbia University Press, 2021); Jack W. Chen et al., eds., *Literary Information in China: A History* (New York: Columbia University Press, 2021); Andreas Marklund and Laura Skouvig, eds., *Histories of Surveillance from Antiquity to the Digital Era: The Eyes and Ears of Power* (London: Routledge, 2021); Ida Nijenhuis et al., eds., *Information and Power in History. Towards a Global Approach* (London: Routledge, 2020); W. Boyd Rayward, ed., *Information Beyond Borders: International Cultural and Intellectual Exchange in the Belle Époque* (Aldershot: Ashgate, 2014); Arndt Brendecke, Markus Friedrich, and Susanne Friedrich, eds., *Information in der Frühen Neuzeit: Status, Bestände, Strategien, Pluralisierung und Autorität* 16 (Berlin: Lit, 2008); W. Boyd Rayward and Mary E. Bowden, eds., *The History and Heritage of Scientific and Technological Information Systems: Proceedings of the 2002 Conference* (Medford, NJ: Information Today, 2004); Mary Bowden, Trudi Hahn, and Robert V. Williams, eds., *Proceedings of the 1998 Conference on the History and Heritage of Science Information Systems* (Medford, NJ: Information Today, 1999); and Trudi Hahn and Michael Buckland, eds., *Historical Studies in Information Science* (Medford, NJ: Information Today, 1998).
- 2 Our preference is for the concept of “information practices” as opposed to “information processes,” as the latter has connotations of technology, whereas the former foregrounds human agency. An earlier *Routledge Handbook*—Chris Meyns, ed., *Information and the History of Philosophy* (London: Routledge, 2021)—also uses information as a lens through which to view history. However, our collection of chapters not only employs a wider lens but also consciously aims to promote the field of information history.
- 3 Joseph R. Hayden, *A History of Disinformation in the U.S.* (London: Routledge, 2024); Melissa Zanders and Kembrew McLeod, eds., *Fake News: Understanding Media and Misinformation in the Digital Age* (Cambridge, MA: MIT Press, 2020); and David Miller, *A Century of Spin: How*



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*Public Relations Became the Cutting Edge of Corporate Power* (London: Pluto Press, 2008). Yuval Harari, *Nexus: A Brief History of Information Networking from The Stone Age to AI* (New York: Random House, 2024), makes the point that human society has always experienced lies, errors, myths, delusions, and fantasies, but in today's world, where information technologies have never been more powerful and where beneficial human connectivity and networking should be at a premium, disinformation, misinformation, inaccurate information, and frictional, or even entirely obstructed, communication are increasing instead of being eroded.

- 4 The two strands of exploration—information history and the history of information—are complementary and both feed into the remit and scope of this collection. Moreover, irrespective of the distinction discussed here, we accept that generally scholars use the two terms interchangeably. However, a distinction might be drawn, at the risk of seeming pedantic, between the historical study of information practices and that of information. The study of past information practices could justifiably conform to the label “information history.” The study of information could more fittingly be termed “the history of information,” in that, aligned with conceptual history, it would focus on changes in the notion or definition of “information” over time, as has been attempted in the case of information's close cousin, data: see Daniel Rosenberg, “Data Before the Fact,” in *Raw Data is an Oxymoron*, ed. Lisa Gitelman (Cambridge, MA: MIT Press, 2013), 15–40. The distinction between information history and the history of information is also discussed in Bonnie Mak and Allen Renear, “What Is Information History?,” *Isis: A Journal of the History of Science Society* 114, no. 4 (December 2023): 756–757.
- 5 On the definition of information, see Marcia Bates, “Information and Knowledge: An Evolutionary Framework for Information Science,” *Information Research* 10, no. 4 (July 2005). <https://files.eric.ed.gov/fulltext/EJ1082014.pdf>.
- 6 Thomas Haigh, “The History of Information Technology,” *Annual Review of Information Science and Technology* 45, no. 1 (2011): 433.
- 7 Albert Borgman, “Information and Reality at the Turn of the Century,” *Design Issues* 11, no. 2 (Summer 1985): 21–22.
- 8 For a critical discussion of these matters, see Laura Skouvig, “Present and Past: The Relevance of Information History,” *Information & Culture* 58, no. 1 (2023): 1–16.
- 9 Richard John, “Debating the New Media: Rewriting Communications History,” *Technology and Culture* 64, no. 2 (April 2023): 310. John states (313) that “It is anachronistic to study a historical phenomenon in relation to what it preceded, rather than what it followed.”
- 10 James Cortada, “Shaping Information History as an Intellectual Discipline,” *Information & Culture* 47, no. 2 (2012): 119–144.
- 11 Arndt Brendecke, Markus Friedrich, and Susanne Friedrich, “Information als Kategorie Historischer Forschung: Heuristik, Etymologie und Abgrenzung vom Wissensbegriff,” in *Information in der Frühen Neuzeit: Status, Bestände, Strategien*, ed. Arndt Brendecke, Markus Friedrich, and Susanne Friedrich, *Pluralisierung und Autorität* 16 (Berlin: Lit, 2008), 16.
- 12 Alistair Mutch, “Unions and Information, Britain 1900–1960: An Essay in the History of Information,” *International Review of Social History* 44 (1999): 397. The importance of context has also underpinned the work of recent advocates of information history: see, for example, Toni Weller, *Information History - An Introduction: Exploring an Emergent Field* (Oxford: Chandos, 2008); and Alistair Black, “Information and Modernity: The History of Information and the Eclipse of Library History,” *Library History* 14 (May 1998): 37–43.
- 13 For example, Dominique Charpin, *Reading and Writing in Babylon*, trans. Jane Marie Todd (Cambridge, MA: Harvard University Press, 2011).
- 14 In *Dragons of Eden: Speculations on the Evolution of Human Intelligence* (New York: Random House, 1977), the astronomer Carl Sagan wrote about the concept of extrasomatic information, that is, information stored outside the body, in media, as opposed to pre-wired, genetic information or information that is extragenetic, generated by learning and experience and carried in the mind or embedded in culture: see Jeffrey Garrett, “Carl Sagan and Libraries: An Original Thinker Remembered,” *IFLA Journal* 50, no. 4 (2024): 832–837.
- 15 William Aspray, “The Many Histories of Information,” *Information & Culture* 50, no. 1 (2015): 1.
- 16 Carol Colatrella, “Information in the Novel and the Novel as Information System: Charles Dickens's *Little Dorrit* and Margaret Drabble's *Radiant Way* Trilogy,” *Information & Culture* 50, no. 3 (2015): 339–371.

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- 17 Colatrella, "Information in the Novel," 349.
- 18 Colatrella, "Information in the Novel," 343.
- 19 James Gleick, *The Information: A History, a Theory, a Flood* (London: Fourth Estate, 2011), 8.
- 20 Gleick, *The Information*, 10.
- 21 Gleick, *The Information*, 357–358.
- 22 For example, Melanie Tebbutt, *Women's Talk? A Social History of Gossip in Working Class Neighbourhoods, 1880–1960* (Aldershot: Scolar Press, 1995); and Anna Clarke, "Whores and Gossips: Sexual Reputations in London 1770–1825," in *Current Issues in Women's History*, ed. Arina Angerman et al. (London: Routledge, 1989), 231–248.
- 23 Elizabeth Horodowich, "Gossip," in *Information: Keywords*, ed. Michele Kennerly, Samuel Frederick, and Jonathan Abel (New York: Columbia University Press, 2021), 89–99.
- 24 Robert Darnton, *The Revolutionary Temper: Paris 1748–1789* (London: Allen Lane, 2023).
- 25 Norman Lewis, *Voices of the Old Sea*, rev. ed. (1984; repr., London: Eland, 2013).
- 26 Lewis, *Voices*, 127.
- 27 Vic Gatrell, *City of Laughter: Sex and Satire in Eighteenth-Century London* (New York: Walker and Co., 2006).
- 28 Sheila Ritchie, *Modern Library Practice* (Buckden: E.L.M. Publications, 1982), 96.
- 29 Peter Burke, *What is the History of Knowledge?* (Cambridge, UK: Polity Press, 2016), 6.
- 30 Mak and Renear, "What Is Information History?," 759; Laura Skouvig, "The Raw and the Cooked: Information and Knowledge in History," in *Forms of Knowledge: Developing the History of Knowledge*, ed. Johan Östling, David Larsson Heidenblad, and Anna Nilsson Hammar (Lund: Nordic Academic Press, 2020), 107–121; Lorraine Daston and Martin Muslow, "History of Knowledge," in *Debating New Approaches to History*, ed. Marek Tamm and Peter Burke (London: Bloomsbury Academic, 2019), 159–187; and Brendecke, Friedrich, and Friedrich, "Information als Kategorie."
- 31 On time cycles in history, see Penelope Corfield, *Time and the Shape of History* (New Haven, CT: Yale University Press, 2007), 248–270.
- 32 Alistair Black and Bonnie Mak, "Period, Theme, Event: Locating Information History in History," in *Information and Power in History. Towards a Global Approach*, ed. Ida Nijenhuis et al. (London: Routledge, 2020), 18–36.
- 33 Judith Flanders, *A Place for Everything: The Curious History of Alphabetical Order* (London: Picador, 2020).
- 34 Studies that have invoked rupture, revolution, or transformation in this regard include Paul M. Dover, *The Information Revolution in Early Modern Europe* (Cambridge, UK: Cambridge University Press, 2021); Edward Beasley, "The Nineteenth-Century Information Revolution and World Peace," in *Information and the History of Philosophy*, ed. Luciano Floridi (Abingdon: Routledge, 2016), 229–244; Aileen Fyfe, "The Information Revolution," in *The Cambridge History of the Book in Britain. Volume VI: 1830–1914*, ed. David McKitterick (Cambridge, UK: Cambridge University Press, 2009), 567–594; Leonard Dudley, *Information Revolutions in the History of the West* (Cheltenham: Edward Elgar, 2008); John McCusker, "The Demise of Distance: The Business Press and the Origins of the Information Revolution in the Early Modern Atlantic World," *The American Historical Review*, 110, no. 2 (April 2005): 295–321; Aad Blok and Greg Downey, eds., "Uncovering Labour in Information Revolutions, 1750–2000," [special issue of] *International Review of Social History*, 48, supplement 11 (2003); Jon Agar, Sarah Green, and Penny Harvey, "Cotton to Computers: From Industrial to Information Revolutions," in *Virtual Society? Technology, Cyberbole, Reality*, ed. Steve Woolgar (Oxford: Oxford University Press, 2002), 264–285; Anthony Grafton, Elizabeth Eisenstein, and Adrian Johns, "AHR Forum: How Revolutionary Was the Print Revolution?," *The American Historical Review*, 107, no. 1 (February 2002): 84–128; Thomas R. Reid, *The Chip: How Two Americans Invented the Microchip and Launched a Revolution* (New York: Random House, 2001); Jonathan Rose, "The Nineteenth-Century Information Revolution," *Nineteenth Century Studies* 13 (1999): 203–213; Kevin Robins and Frank Webster, *Times of the Technoculture: From the Information Society to the Virtual Life* (London: Routledge, 1999), 87–108 [these pages form Chapter 4, which carries the title "The Long History of the Information Revolution"]; Margaret Stieg, "The Nineteenth-Century Information Revolution," *Journal of Library History* 15, no. 1 (Winter 1980): 22–52; Michael Clanchy, *From Memory to Written Record: England, 1066–1307* (Cambridge, MA:

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- Harvard University Press, 1979); and Elizabeth Eisenstein, *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early-Modern Europe* (Cambridge, UK: Cambridge University Press, 1979).
- 35 Among others, see Gabrielle Hecht, “Rupture-talk in the Nuclear Age: Conjugating Colonial Power in Africa,” *Social Studies of Science* 32, no. 6 (December 2002): 691–727; Bruno Latour, *We Have Never Been Modern*, trans. C. Porter (Cambridge, MA: Harvard University Press, 1993); and Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (New York: Pantheon, 1972).
- 36 For example, Philip Mirowski and Edward Nik-Khah, *The Knowledge We Have Lost in Information: The History of Information in Modern Economics* (New York: Oxford University Press, 2017), 1, highlights a particular moment of “cultural rupture,” that is, the post-1945 growth in (post-modern) questioning as to whether economic analysis can ever deliver the “truth,” the post-modern project being closely aligned with the move towards a digitally mediated society.
- 37 Anthony Giddens, *The Consequences of Modernity* (Cambridge, UK: Polity Press, 1991); David Harvey, *The Condition of Post-Modernity: An Enquiry into the Origins of Cultural Change* (Oxford: Blackwell, 1989); and Carolyn Marvin, *When Old Technologies Were New: Thinking about Electric Communication in the Late Nineteenth Century* (New York: Oxford University Press, 1988).
- 38 László Z. Karvalics, “Information Policy before Information Policies: Conceptual and Historical Considerations,” in *Research Handbook on Information Policy*, ed. Alistair Duff (Cheltenham: Edward Elgar, 2021), 69–79.
- 39 David Bawden and Lyn Robinson, *Introduction to Information Science*, 2nd ed. (London: Facet, 2022), 20, outlines what have been widely seen as the defining developments in the history of information (including, and especially, the “documentary” forms that have carried it): language, recorded signs and symbols, writing and scripts, printing, mass communications, the digital computer, and the internet.
- 40 Steven Fischer, *A History of Language* (London: Reaktion, 1999); Stephen Houston, ed., *The First Writing: Script Invention as History and Process* (Cambridge, UK: Cambridge University Press, 2004); Steven Fischer, *A History of Writing* (London: Reaktion, 2003); and Wayne M. Senner, ed., *The Origins of Writing* (Lincoln, NE: University of Nebraska Press, 1989).
- 41 Jonathan Bloom, “Papermaking: The Historical Diffusion of an Ancient Technique,” in *Mobilities of Knowledge*, ed. Heike Jöns, Peter Meusburger, and Michael Heffernan (Cham: Springer Open, 2017), 51–66; Fischer, *A History of Writing*; and Eisenstein, *The Printing Press*.
- 42 Clanchy, *From Memory to Written Record*; and James Burke, *Connections* (New York: Simon and Schuster, 2007), 127.
- 43 Randolph C. Head, “Records, Secretaries, and the European Information State, circa 1400–1700,” in *Information: A Historical Companion*, ed. Ann Blair et al. (Princeton, NJ: Princeton University Press, 2021), 104–127; Paul Dover, *Secretaries and Statecraft in the Early Modern World* (Edinburgh: Edinburgh University Press, 2016); and Edward Higgs, *The Information State in England: The Central Collection of Information on Citizens since 1500* (Houndmills: Palgrave Macmillan, 2004).
- 44 Baldassare Castiglione, *The Book of the Courtier: The Singleton Translation: An Authoritative Text Criticism* (New York: W. W. Norton & Co., 2002).
- 45 Jacob M. Price, “Directions for the Conduct of a Merchant’s Counting House, 1766,” in *Business in the Age of Reason*, ed. R. T. P. Davenport-Hines and Jonathan Liebenau (London: Frank Cass, 1987), 134–150; Poor Law Commission Office, *Consolidated General Order*, July 26, 1847. <https://workhouses.org.uk/gco/gco1847.shtml>. See also Toni Weller, “The Puffery and Practicality of Etiquette Books: A New Take on Victorian Information Culture,” *Library Trends* 62, no. 3 (Winter 2014): 663–680.
- 46 Galen Brokaw, *A History of Khipus* (Cambridge, UK: Cambridge University Press, 2010).
- 47 Rebecca Jean Emigh, “(The) Transition(s) to Capitalism(s)? A Review Essay,” *Comparative Studies in Society and History* 46, no. 1 (January 2004): 188–198.
- 48 Will Slauter, “Periodicals and the Commercialization of Information in the Early Modern Era,” in *Information: A Historical Companion*, ed. Ann Blair et al. (Princeton, NJ: Princeton University Press, 2021), 128–151; and Alistair Black and Dan Schiller, “Systems of Information: The Long View,” *Library Trends*, 62, no. 3 (Winter 2014): 632–634.

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- 49 Sophus A. Reinhert and Robert Fredona, “Merchants and the Origins of Capitalism,” Harvard Business School Working Paper No. 18-021 (2017). [https://www.hbs.edu/ris/Publication%20Files/18-021\\_b3b67ba8-2fc9-4a9b-8955-670d5f491939.pdf](https://www.hbs.edu/ris/Publication%20Files/18-021_b3b67ba8-2fc9-4a9b-8955-670d5f491939.pdf).
- 50 Gerhard Dohrn-van Rossum, *History of the Hour: Clocks and Modern Temporal Orders* (Chicago, IL: Chicago University Press, 1996).
- 51 Black and Schiller, “Systems of Information,” 640–644; Lorraine Daston and Elizabeth Lunenburg, eds., *Histories of Scientific Observation* (Chicago, IL: Chicago University Press, 2010); and Peter M. Heimann, “The Scientific Revolutions,” in *The New Cambridge Modern History. Volume 13, Companion Volume*, ed. Peter Burke (Cambridge, UK: Cambridge University Press, 1979), 248–270.
- 52 Devin Vartija, “Revisiting Enlightenment Racial Classification: Time and the Question of Human Diversity,” *Intellectual History Review* 31, no. 4 (2021): 603–625; Anne Mariss, “A Library in the Field: The Use of Books Aboard the Ship ‘Resolution’ During Cook’s Second Circumnavigation, 1772–1775,” in *Understanding Field Science Institutions*, ed. Helena Ekerholm et al. (London: Science History Publications, 2017), 41–70; and Roger Williams, *Botonophilia in Eighteenth-Century France* (Dordrecht: Springer Science and Business Media, 2001).
- 53 Gabor Szommer, “Parallel Expansions: The Role of Information during the Formative Years of the English East India Company (1600–1623),” *Information & Culture* 53, nos. 3–4 (2018): 303–336; Sylvia Sellers-Garcia, *Distance and Documents at the Spanish Empire’s Periphery* (Stanford, CA: Stanford University Press, 2014); and Jeremy Baskes, “Communication Breakdown: Information and Risk in Spanish Atlantic World Trade during an Era of ‘Free Trade’ and War,” *Colonial Latin American Review* 20, no. 1 (2011): 35–60.
- 54 Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society* (Chicago, IL: Chicago University Press, 1998), 92–143, emphasises the late seventeenth century and Enlightenment origins and emergence of the control dynamic in the modern state, despite the growing enthusiasm for the operation of the free market and political economy. Nicholas Popper, *The Specter of the Archive: Political Practice and the Information State in Early Modern Britain* (Chicago, IL: Chicago University Press, 2024) examines the growth of the state at this time with reference to the availability of paper, the proliferation of which allowed statesmen to record drafts, memoranda and other ephemera; as original paperwork and copies alike saturated the government machine, information management was drawn to the centre of politics and state affairs in Britain. See, also, Jeremy Black, *The Power of Knowledge: How Information and Technology Made the Modern World* (New Haven, CT: Yale University Press, 2014), 135–138; Peter Burke, “Reflections on the Information State,” in *Information in der Frühen Neuzeit: Status, Bestände, Strategien*, ed. Arndt Brendecke, Markus Friedrich, and Susanne Friedrich, *Pluralisierung und Autorität* 16 (Berlin: Lit, 2008), 51–63; Jacob Soll, *The Information Master: Jean-Baptiste Colbert’s Secret State Intelligence System* (Ann Arbor, MI: University of Michigan Press, 2009).
- 55 Brendecke, Friedrich, and Friedrich, “Information als Kategorie,” 15–18.
- 56 See, for example, Henry E. Lowood, “The Calculating Forester: Quantification, Cameral Science, and the Emergence of Scientific Forestry Management in Germany,” in *The Quantifying Spirit in the Eighteenth Century*, ed. Tore Frängsmyr, J. L. Heilbron, and Robin E. Rider (Berkeley, CA: University of California Press, 1990), 315–343.
- 57 Mary N. Roberts, “The Naming Game: Ideologies of Luba Artistic Identity,” *African Arts* 31, no. 4 (1998): 56–73, and 90–92.
- 58 Beasley, “The Nineteenth-Century Information Revolution and World Peace”; John W. Randolph, “Communication and Obligation: The Postal System of the Russian Empire,” in *Information and Empire: Mechanisms of Communication in Russia, 1600–1850*, ed. Katherine Bowers and Simon Franklin (Cambridge, UK: Open Book Publishers, 2017), 155–184; and Martin Daunton, *Royal Mail: The Post Office Since 1840* (London: Athlone Press, 1985).
- 59 Toni Weller, *The Victorians and Information: A Social and Cultural History* (Saarbrücken: Verlag Dr. Muller, 2009), 157.
- 60 Weller, *The Victorians and Information*, 97–107. See also Weller, “Preserving Knowledge through Popular Victorian Periodicals: An Examination of the *Penny Magazine* and the *Illustrated London News*, 1842–1843,” *Library History* 24, no. 3 (2008): 200–208.
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- 62 Jillian M. Hess, *How Romantics and Victorians Organized Information: Commonplacebooks, Scrapbooks and Albums* (Oxford: Oxford University Press, 2022).
- 63 Mary Warner Marien, *Photography: A Cultural History*, 5th ed. (London: Laurence King, 2021); and Robert Hirsch, *Seizing the Light: A Social and Aesthetic History of Photography*, 3rd ed. (London: Routledge, 2017).
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- 65 Eric J. Hobsbawm, "The Tramping Artisan," *Economic History Review* 3, no. 3 (1951): 299–320.
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- 67 John, "Recasting the Infrastructure," 86.
- 68 John Tregoning, *A Treatise on Factory Management* (Lynn, MA: Thomas P. Nichols, 1891), iii. See, also, Edwin T. Freedley, *Common Sense in Business* (Philadelphia, PA: Claxton, Ramsden and Haffelfinger, 1879).
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- 70 On the history of the telephone and telegraph, see Dan Schiller, *Crossed Wires: The Conflicted History of US Telecommunications, from the Post Office to the Internet* (New York: Oxford University Press, 2023); and Laszlo Solymar, *Getting the Message: A History of Communications*, 2nd ed. (Oxford: Oxford University Press, 2021).
- 71 Toni Weller and David Bawden, "The Social and Technological Origins of the Information Society: An Analysis of the Crisis of Control in England, 1830–1900," *Journal of Documentation* 61, no. 6 (2005): 777–802; Gerri Flanzraich, "The Library Bureau and Office Technology," *Libraries & Culture* 28, no. 4 (Fall 1993): 403–429; John Orbell, "The Development of Office Technology," in *Managing Business Archives*, ed. Alison Turton (Oxford: British Archives Council, 1991), 60–83; JoAnne Yates, *Control Through Communication: The Rise of System in American Management* (Baltimore, MD: Johns Hopkins University Press, 1989); and James Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society* (Cambridge, MA: Harvard University Press, 1986). One aspect of this manual information-management revolution was the rise of the humble memo: see JoAnne Yates, "The Emergence of the Memo as a Managerial Genre," *Management Communication Quarterly* 2, no. 4 (1989): 485–510; and from a different perspective, emphasising the decline of rhetoric rather than the rise of management, see John Guillory, "The Memo and Modernity," *Critical Inquiry* 31, no. 1 (2004): 108–132.
- 72 Tom Standage, *The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth-Century's On-line Pioneers* (London: Weidenfeld and Nicolson, 1998). On the telegraph and empire generally, see Gerrit Knaap, "Communication, Information, and Power in the Dutch Colonial Empire: The Case of the Dutch East India Company, c. 1760," in *Information and Power in History: Towards a Global Approach*, ed. Ida Nijenhuis et al. (London: Routledge, 2020), 122–137; Miles Ogborn, *Indian Ink: Script and Print in the Making of the English East India Company* (Chicago, IL: Chicago University Press, 2007); Michael O'Leary, Wanda Orlikowski, and JoAnne Yates, "Distributed Work over the Centuries: Trust and Control in the Hudson Bay Company, 1670–1826," in *Distributed Work*, ed. Pamela J. Minds and Sara Kiesler (Cambridge, MA: MIT Press, 2002), 27–51; and Christopher Bayly, *Empire and Information: Intelligence-gathering and Social Communication in India, 1780–1850* (Cambridge, UK: Cambridge University Press, 1996).
- 73 Armand Mattelart, *The Invention of Communication* (Minneapolis, MN: University of Minnesota Press, 1996), 165–170. See, also, Nicole Starosielski, *The Undersea Network* (Durham, NC: Duke University Press, 2015).
- 74 Eviatar Zerubavel, "The Standardization of Time: A Sociohistorical Perspective," *American Journal of Sociology* 88, no. 1 (July 1982): 1–23. The standardisation of global time was instituted by the International Meridian Conference (Washington, DC, October 1884), which named Greenwich, in South-East London, as the site of the global meridian.
- 75 Peter Crooks and Timothy H. Parsons, eds., *Empires and Bureaucracy in World History: From Late Antiquity to the Twentieth Century* (Cambridge, UK: Cambridge University Press, 2016).

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- 77 Alex Csiszar, *The Scientific Journal: Authorship and the Politics of Knowledge in the Nineteenth Century* (Chicago, IL: Chicago University Press, 2018); and Csiszar, "How Lives Became Lists and Scientific Papers Became Data: Cataloguing Authorship during the Nineteenth Century," *The British Journal for the History of Science* 50, no. 1 (March 2017): 23–60.
- 78 Alex Wright, *Cataloguing the World: Paul Otlet and the Birth of the Information Age* (Oxford: Oxford University Press, 2014); and Paul Otlet, *Mundaneum: Archives of Knowledge*, Occasional Paper No. 215, ed. and trans. W. Boyd Rayward (Urbana, IL: Graduate School of Library and Information Science, University of Illinois, 2010). <https://www.ideals.illinois.edu/items/15485>.
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- 80 Dave Muddiman, "The Universal Library as Modern Utopia: The Information Society of H.G. Wells," *Library History* 14 (1998): 85–101.
- 81 Willem Roelf Henderikus Koops and Joachim Wieder, eds., *IFLA's First Fifty Years: Achievement and Challenge in International Librarianship* (Munich: Verlag Dokumentation, 1977).
- 82 David Bawden, "Aslib: A De Facto National Library/Information Organization," *Alexandria* 26, no. 1 (2016): 15–27; and Irene Farkas-Conn, *From Documentation to Information Science: The Beginnings and Early History of the American Documentation Institute – American Society for Information Science* (Westport, CT: Greenwood Press, 1990).
- 83 A classic example of this impulse is William H. Leffingwell, *Scientific Office Management* (New York: A.W. Shaw, 1917), which applied Frederick Taylor's scientific management methods to the information-management setting of the office. In their office operations, Leffingwell advised, companies should observe, record, standardise, set tasks, and teach (4). Filing systems should be developed "that really remember" (158). Businesses should gather information "from the outside," such as that concerning their place in the market in relation to others or that related to new techniques and products. But information should also be gathered "from the inside," with observers gathering data and recording methods in relation to work processes, including via time-and-motion behavioural studies. A further example of the internal generation of information advised by Leffingwell was the detailed data that sales staff—including salesmen in the field—should gather on the businesses they serviced (109).
- 84 Kevin Robins and Frank Webster, *The Technical Fix: Education, Computers and Industry* (Basingstoke: Macmillan, 1989), 39.
- 85 William Aspray, *Understanding Information History: The Case of America in 1920* (Cham: Springer Nature, 2023).
- 86 Thomas Haigh and Paul Ceruzzi, *A New History of Modern Computing* (Cambridge, MA: MIT Press, 2021); Lars Heide, *Punched-Card Systems and the Early Information Explosion, 1880–1945* (Baltimore, MD: Johns Hopkins University Press, 2009); and Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace and Company, 1934).
- 87 Alistair Black, "Aspects of the History of State Information Policies in Britain before 1945," in *Research Handbook on Information Policy*, ed. Alistair Duff (Cheltenham: Edward Elgar, 2021), 80–95; Jon Agar, *The Government Machine: A Revolutionary History of the Computer* (Cambridge, MA: MIT Press, 2003); and Higgs, *The Information State*. Chris A. Williams, *Police Control Systems in Britain, 1775–1975: From Parish Constable to National Computer* (Manchester: Manchester University Press, 2014), especially 85–117, addresses information management in the police, shows that this growing capability had a long gestation.
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- 102 Neil Postman, *Building a Bridge to the 18th Century: How the Past Can Improve Our Future* (New York: Vintage Books, 2000), 86–88.
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  - 113 James Raven, *What is the History of the Book?* (Cambridge, UK: Polity Press, 2018) offers a global perspective on the history of the book, one that, moreover, takes account of its many formats over the past 5,000 years; the history of the book is not merely about the history of the printed codex.
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  - 118 Among others, Nicholas Dames, *The Chapter: A Segmented History from Antiquity to the Twenty-First Century* (Princeton, NJ: Princeton University Press, 2023); Bonnie Mak, “Manuscript,” in *Cambridge Critical Concepts: Technology and Literature*, ed. Adam Hammond (Cambridge, UK: Cambridge University Press, 2023), 45–68; Rouse and Rouse, “*Statim Invenire*”; and M. B. Parkes, “The Influence of the Concepts of *Ordinatio* and *Compilatio* on the Development of the Book,” in *Medieval Learning and Literature: Essays presented to Richard William Hunt*, ed. J. J. G. Alexander and M. T. Gibson (Oxford: Clarendon Press, 1976), 115–141.
  - 119 This growth challenged attitudes to the products of the early printing industry which were seen by many, even into the sixteenth century, as “vulgar,” or unrefined, because of their association with a public readership and with the evolving capitalist market: see Siobhan Keenan, *Renaissance Literature* (Edinburgh: Edinburgh University Press, 2008), 34.
  - 120 As covered in a variety of chapters in *The Cambridge History of the Book in Britain. Volume III: 1400–1557*, ed. Lotte Hellinga and J. B. Trapp (Cambridge, UK: Cambridge University Press, 1999).
  - 121 Lynette Hunter, “Books for Daily Life: Household, Husbandry, Behaviour,” in *The Cambridge History of the Book in Britain. Volume IV: 1557–1695*, ed. John Barnard and D. F. McKenzie (Cambridge, UK: Cambridge University Press, 2002), 514–532. See, also, Blair, *Too Much to Know*.
  - 122 Daniel Headrick, *When Information Came of Age: Technologies of Knowledge in the Age of Reason and Revolution, 1700–1850* (Oxford: Oxford University Press, 2000), 143; Fyfe, “The Information Revolution”; and Weller, “The Puffery and Practicality of Etiquette Books.”
  - 123 David Lyon, Frank Webster, and Kevin Robins are good examples of sociologists who have been keenly aware of the importance of information historically but who have not placed their work specifically in an information history framework. See, for example, David Lyon, *The Electronic*

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- Eye: The Rise of Surveillance Society* (Cambridge, UK: Polity Press, 1994); and Kevin Robins and Frank Webster, *Information Technology: A Luddite Analysis* (Norwood: Ablex, 1986).
- 124 Early theorising of the “end of continuity” came from Peter Drucker, *The Age of Discontinuity* (New York: Harper and Row, 1969). On the development of the information society concept, see Alistair Duff, Davis Craig, and David McNeill, “A Note on the Origins of the Information Society,” *Journal of Information Science* 22, no. 2 (1996): 117–122; David Lyon, *The Information Society: Issues and Illusions* (Cambridge, UK: Polity Press, 1988); and Susan Crawford, “The Origin and Development of a Concept: The Information Society,” *Bulletin of the Medical Library Association* 71, no. 4 (October 1983): 380–385. The information society concept originated in the field of economics and later spread to other areas, including sociology and information science. The seminal work on the emergence of an information, or knowledge, economy was undertaken by Fritz Machlup, *The Production and Distribution of Knowledge in the United States* (Princeton, NJ: Princeton University, 1962). This was followed by Marc Porat, *The Information Economy* (Washington, DC: U.S. Department of Commerce, Office of Telecommunications, 1977). Both examined historical trends in knowledge/information industries and occupations.
  - 125 Alain Touraine, *The Post-Industrial Society* (New York: Random House, 1971), 5, 19, and 61–63. The book was originally published as *La société post-industrielle* (Paris: Editions Denoël, 1969).
  - 126 Daniel Bell, *The Coming of Post-Industrial Society: Venture in Social Forecasting* (London: Heinemann, 1974).
  - 127 Alvin Toffler, *The Third Wave* (London: Pan Books, 1980), 46.
  - 128 Lisa Bud-Frierman, *Information Acumen: The Understanding and Use of Knowledge in Modern Business* (London: Routledge, 1994); Yates, *Control Through Communication*; Beniger, *The Control Revolution*; and Alfred Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA: Harvard University Press, 1977). On the bureaucratisation of business, see Sebastian Felton and Christine von Oertzen, “Bureaucracy as Knowledge,” *Journal for the History of Knowledge* 1, no. 1 (2020): 1–16; Crooks and Parsons, eds., *Empires and Bureaucracy in World History* and Christopher Dandeker, *Surveillance, Power and Modernity: Bureaucracy and Discipline from 1700 to the Present* (Cambridge, UK: Polity Press, 1990).
  - 129 Peter Simonson et al., eds., *The Handbook of Communication History* (New York: Routledge, 2012); Dan Schiller, *How to Think about Information* (Urbana, IL: University of Illinois Press, 2007); Jorge Reina Schement, ed., *Encyclopedia of Communication and Information* (New York: Macmillan Reference U.S.A., 2002); and Dan Schiller, *Theorizing Communication: A History* (New York: Oxford University Press, 1996). Solymar, *Getting the Message*, is peppered with the word “information.”
  - 130 Asa Briggs and Peter Burke, *A Social History of the Media: From Gutenberg to Facebook*, 4th ed., with Espen Ytreberg (Cambridge, UK: Polity Press, 2020), 1.
  - 131 Marshall McLuhan, *Understanding Media: The Extension of Man* (London: Routledge and Kegan Paul), 147, and *passim*.
  - 132 On the definition and development of the information sciences and associated information professions, see Marcia Bates, “The Information Professions: Knowledge, Memory, Heritage,” *Information Research*, 20, no. 1 (March 2015). <http://informationr.net/ir/20-1/paper655.html#Y0PnEUbMLIU>. Bates does not specifically include computer science in her “definition,” but it is legitimate to do so for the purpose of this discussion, the discipline having developed a strong history of itself. William Aspray, “The Many Histories of Information,” *Information & Culture* 50, no. 1 (2015): 1–23, also sees the information sciences as the natural home of information history, although in addition he cites communication studies as an equally welcoming harbour.
  - 133 As discussed by several contributors to Fritz Machlup and Una Mansfield, eds., *The Study of Information: Interdisciplinary Messages* (New York: John Wiley, 1983). See, also, Alistair Black, “Every Discipline Needs a History: Information Management and the Early Information Society in Britain,” in *Aware and Responsible: Papers of the Nordic-International Colloquium on Social and Cultural Awareness and Responsibility in Library, Information and Documentation Studies (SCARLID)*, ed. W. Boyd Rayward (Lanham, MD: Scarecrow Press, 2004), 29–47.

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- 134 Campbell-Kelly and Aspray, *Computer*. Aside from including the word “information” in their sub title, the authors explore computing’s pre-electronic history, in part by deploying the concept of information processing.
- 135 James Cortada, “Where Did Knowledge Workers Come From?,” in *The Rise of the Knowledge Worker*, ed. Cortada (Boston, MA: Butterworth Heinemann, 1998), 5, where it is argued that the literature on the “history of information” could “fill a building.”
- 136 Anthony Bryant et al., eds., *Information Systems: Why History Matters*, [special issue of] *Journal of Information Technology* Part 1: 28, no. 1 (March 2013): 1–89; Part 2: 28, no. 2 (June 2013): 91–166.
- 137 For example, Markus Krajewski, *Paper Machines: About Cards & Catalogs, 1548–1929* (Cambridge, MA: MIT Press, 2011); and Friedrich A. Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford, CA: Stanford University Press, 1999).
- 138 Among others, see Heather MacNeil, “From the Memory of the Act to the Act Itself. The Evolution of Written Records as Proof of Jural Acts in England, 11th to 17th Century,” *Archival Science* 6, nos. 3–4 (2006): 313–328; Francis X. Blouin and William G. Rosenberg, eds., *Archives, Documentation and Institutions of Social Memory: Essays from the Sawyer Seminar* (Ann Arbor, MI: Bentley Historical Library, University of Michigan, 2006); Eric Ketelaar, *The Archival Image: Collected Essays* (Hilversum: Verloren, 1997); Luciana Duranti, “Medieval Universities and Archives,” *Archivaria* 38 (1994–95): 37–44; and Ernst Posner, *Archives in the Ancient World* (Cambridge, MA: Harvard University Press, 1972).
- 139 Elizabeth Yale, “The History of Archives: The State of the Discipline,” *Book History* 18 (2015): 332; Lisa Gitelman, *Paper Knowledge: Towards a Media History of the Document* (Durham, NC: Duke University Press, 2014); Ben Kafka, *The Demon of Writing: Powers and Failures of Paperwork* (Cambridge, MA: Zone Books, 2012); and Blair, *Too Much to Know*.
- 140 Randolph C. Head, *Making Archives in Early Modern Europe: Proof, Information, and Political Record-Keeping, 1400–1700* (Cambridge, UK: Cambridge University Press, 2019); Michael Mann, *The Sources of Power. Volume 2: The Rise of Classes and Nation-States, 1760–1914*, 2nd ed. (Cambridge, UK: Cambridge University Press, 2012), 444–478; Soll, *The Information Master*; and Higgs, *The Information State in England*.
- 141 W. Boyd Rayward, “The History and Historiography of Information Science: Some Reflections,” in *Historical Studies in Information Science*, ed. Trudi Hahn and Michael Buckland (Medford, NJ: Information Today, Inc., 1998), 7–21. The American Society for Information Science and Technology is home to a historical special interest group: The History and Foundations of Information Science. The group’s present name was adopted in 1995, but work on the history of information science has a much longer pedigree: see Robert V. Williams, *Bibliography of the History of Information Science and Technology*, 8th ed. (American Society for Information Science and Technology, 2012). <https://www.asist.org/about/history-of-information-science/bibliography-of-the-history-of-information-science-and-technology/>.
- 142 Such scholars include W. Boyd Rayward, Michael Buckland, Jesse Shera, Colin Burke, Irene Farkas-Conn, Thomas Hapke, and Pamela Richards. Their writings and those of other leading scholars are discussed in Michael Buckland and Ziming Liu, “The History of Information Science,” *Annual Review of Information Science and Technology* 30 (1995): 385–416. See also, Thomas Haigh, “The History of Information Technology,” *Annual Review of Information Science and Technology* 45, no. 1 (2011): 431–487; and Bowden, Hahn, and Williams, *Proceedings of the 1998 Conference on the History and Heritage*. The tradition of recognising the importance of historical perspective in information science has been continued, more recently, by Bawden and Robinson, *Introduction to Information Science*.
- 143 John Feather, *The Information Society: A Study of Continuity and Change*, 5th ed. (London: Facet, 2008); Alistair Duff, *Information Society Studies* (London: Routledge, 2000); and Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things Out: Classification and Its Consequences* (Cambridge, MA: MIT Press, 1999).
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- 145 Stevens, “The History of Information.”
  - 146 In chronological order, see Pamela Richards, “The Quest for Enemy Scientific Information 1939–1945: Information History as Part of Library History,” *Library History* 9, nos. 1–2 (January 1991): 5–14; László Karvalics, “The Claims, Pre-History and Programme of Historical Informatics,” *Periodica Polytechnic Social and Management Sciences* 2, no. 1 (1994): 19–30; Alistair Black, “Lost Worlds of Culture: Victorian Libraries, Library History and Prospects for a History of Information,” *Journal of Victorian Culture* 2, no. 1 (Spring, 1997): 124–141; Black, “Information and Modernity”; Ilkka Mäkinen, “Why Do We Need Information History?,” *BOBCATSSS Symposium, Bratislava* (January 25–27, 1999). [https://www.ru.ac.za/media/rhodesuniversity/content/research/documents/annualresearchreports/Annual\\_Research\\_Report\\_2022.pdf](https://researchportal.tuni.fi/en/publications/why-do-we-need-information-history-paper-at-bobcatsss-symposium-b; Boris Volodin, “History of Librarianship, Library History, or Information History: A View from Russia,” <i>Library Quarterly</i> 70, no. 4 (October 2000): 446–467; Ilkka Mäkinen et al., “Information and Libraries in an Historical Perspective: From Library History to Library and Information History,” in <i>European Curriculum Reflections on Library and Information Science Education</i>, ed. Leif Kajberg and Leif Lørring (Copenhagen: The Royal School of Library and Information Science, 2005), 172–191; Toni Weller, “A New Approach: The Arrival of Informational History,” <i>Proceedings of the XVI International Conference of the Association for History and Computing: Humanities, Computers and Cultural Heritage</i> (Amsterdam: Royal Netherlands Academy of Arts and Sciences Amsterdam, 2005), 273–278; Alistair Black, “Information History,” <i>Annual Review of Information Science and Technology</i>, 40 (2006): 441–473; Toni Weller and David Bawden, “Individual Perceptions: A New Chapter on Victorian Information History,” <i>Library History</i> 22, no. 2 (2006): 137–156; Laura Skouvig, “Bibliotekshistorie, død eller dristig,” <i>Dansk Biblioteksforskning</i> 3, no. 1 (2007): 5–16; and Toni Weller, “Information History: Its Importance, Relevance, and Future,” <i>ASLIB Proceedings</i>, 59, nos. 4–5 (2008): 437–448; and Weller, <i>Information History</i>.</li>
<li>147 Paul Edwards et al., “AHR Conversation: Historical Perspectives on the Circulation of Information,” <i>American Historical Review</i> 116, no. 5 (December 2011): 1403–1404.</li>
<li>148 John Durham Peters, “Information: Notes towards a Critical History,” <i>Journal of Communication Inquiry</i> 12, no. 2 (July 1988): 9; and John M. Roberts, <i>The Triumph of the West</i> (London: BBC, 1985), 236.</li>
<li>149 For a sceptical look at the information society proposition, see Frank Webster, <i>Theories of the Information Society</i>, 4th ed. (London: Routledge, 2014).</li>
<li>150 Briggs and Burke, <i>A Social History of the Media</i>, 321–354; Julienne du Toit, “Conspiring at High Speed,” <i>Rhodes University Research Report 2021</i> (Makhanda [Grahamstown]: Rhodes University, 2022). <a href=); Niels Brügger et al., eds., *Internet Histories* (Abingdon: Routledge, 2018); Bonnie Mak, “Archaeology of a Digitization,” *Journal of the Association for Information Science and Technology* 65, no. 8 (August 2014): 1515–1526; Martin Campbell-Kelly, “The History of the Internet: The Missing Narratives,” *Journal of Information Technology* 28, no. 1 (March 2013): 18–33; José Van Dijck, *The Culture of Connectivity: A Critical History of Social Media* (Oxford: Oxford University Press, 2013); Johnny Ryan, *A History of the Internet and the Digital Future* (London: Reaktion Books, 2010); and Janet Abbate, *Inventing the Internet* (Cambridge, MA: MIT Press, 1999). Tom Standage, *Writing on the Wall: Social Media – The First 2000 Years* (London: Bloomsbury, 2013), demonstrates that extensive communication through social networks stretches back to antiquity.
  - 151 See John Tosh, *The Pursuit of History: Aims, Methods and New Directions in the Study of History*, 7th ed. (London: Routledge, 2022), 55–56, and 59–60 on, respectively, the “new history” and “history from below.” For an example of micro, informal, everyday information history, or information exchange, see Denice Fett, “Information, Gossip, and Rumor: The Limits of Intelligence at the Early Modern Court, 1558–1585,” in *The Limits of Empire: European Imperial Formations in Early Modern World History: Essays in Honor of Geoffrey Parker*, ed. Tonio Andrade and William Reger (Farnham: Ashgate, 2012), 79–98. On informal information exchange among gentlemen scientists in the Scientific Revolution, see Steven Shapin, *A Social History of*

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- 153 Amanda Spink, *Information Behavior: An Evolutionary Instinct* (New York: Springer, 2010).
- 154 On surveillance as an aspect of the history of power and control, see Marklund and Skouvig, eds., *Histories of Surveillance*.