

## Paper Technologies, Digital Technologies:

### Working with Early Modern Medical Records

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**Abstract:** This chapter is about what happens when historians use digital technologies to understand paper technologies. It is prompted by my work on one of the largest surviving sets of medical records in history, the casebooks of two early modern English astrologers. While the medical encounter has become a defining moment in medical humanities, historians of medicine have a longer tradition of using casebooks, observations and other forms of medical records to write histories that foreground the patient. These documents were produced through conventions of observing, remembering, recording and retaining records of cases. They are rich in quantitative data and qualitative description, in data and voice, and digital analysis allows us to navigate and analyze them, especially through visualization techniques. Yet, I argue, just as what constitutes a medical record needs to be historically, critically assessed, so we need to reflect on what it means to render these paper documents into a digital form.

**Keywords:** medical records, casebooks, patients, medical encounter, digital humanities, data visualization

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As the digital revolution takes hold, historians have begun to reflect on the ways in which paper technologies—the codex, notebook, printed book and their indexes, annotations and tools of ordering—have come into being and contributed to the production of knowledge. Objects that were once considered evidence for historical inquiry have become their subjects.<sup>1</sup> The same reflexivity applies to notions of evidence, observation and objectivity, often labeled as facts and data, which have themselves been historically studied.<sup>2</sup> This chapter is about what happens when historians use digital technologies to understand paper technologies. It draws on my work to digitise one of the largest surviving sets of medical records in history, a series of 80,000 seventeenth-century astrological cases bound in 64 thick volumes. I call this the Casebooks Project. This work, as this chapter explains, is an experiment in the history of medicine and digital humanities.<sup>3</sup> It uses new digital technologies to understand what were, in the seventeenth century, new paper technologies. Questions of evidence and its representation and analysis are central to this endeavour.

Just as the processes that produced the written documents—in this case a series of medical encounters—shaped habits of talking and listening, thinking and remembering, reading and recording, so the processes of digitising these records—photographing, transcribing, coding—produces meaning. Digitising the manuscript records does not make them instantly meaningful. The major challenge for the Casebooks Project is to render the historical documents and the encounters they record in forms that are true to the seventeenth-century archive and intelligible to twenty-first-century readers. The records are by definition open to multiple uses and interpretations, and the project aims to retain a sense of play within the records while preserving their technical and analytic complexities and tutoring users in the critical skills to understand them.

As a social historian of medicine and a historian of science, I borrow from microhistory and anthropology, focus on immediate and often mundane ritualised dynamics, and ask fundamental questions about what constitutes knowledge and how meaning is produced. The problematic of 'naturalisation', which endows knowledge, objects and bodies with inherent and fixed value informs this work. My questions and theoretical stance speak to concerns in the field of critical medical humanities, while my methods and sources are firmly rooted in historical practices. The casebooks are deliberately at the centre of my analysis; at each juncture we need to ask how these documents came into being and what they represent, in their material and digital forms. This prompts, in the first part of this chapter, a historical assessment of what constitutes a seventeenth-century medical record.

Casebooks, as we will see, document medical encounters and potentially record patient voices, but they do not necessarily contain narratives of illness.

The second part of this chapter reflects on the casebooks as evidence for past experiences of illness and practices of healing, and the potentials for using digital tools to study them. Building on the arguments from the emerging fields of digital humanities and using lessons from the Casebooks Project, in the final part of the chapter I will argue for the importance of attending to the materiality of the sources when using digital tools and for the need to subject digital visualization techniques to the same critical assessment as other forms of evidence. Computer generated data may be quantitatively robust, but it is not inherently certain or self-evidently meaningful. It requires analysis just like any other artefact. Yet the way in which this data is produced, through teams of researchers and computers, and the forms that it takes—percentages, tables, charts—potentially leads to the reification or fetishisation of this material, rather than its assessment according to critical standards. Data and voice, list and narrative, calibration and feel are as much a feature of early modern records of medical encounters as they are in the work of historians of medicine.

### I. What was a medical record?

Doctors have not always kept records. The practice was invented by Hippocrates, the ancient father of medicine, lost for more than a thousand years, and rediscovered in sixteenth-century Italy by doctors who modeled themselves on their ancient forebear. Hippocrates wrote on clay tablets, sixteenth-century doctors wrote on paper, and their shared habits provide an origin myth that locates the medical record as a defining feature of rational medicine. Narrating illnesses and documenting encounters was often, but not always, a feature of these records. I will return to questions about medical encounters and illness

narratives, and their place in the history of medicine and medical humanities, below. First I want to sketch a history of medical records that situates them not in terms of their ancient lineage but within the history of 'paper technologies'.<sup>4</sup>

When doctors began keeping records in the middle of the sixteenth century, they typically recorded cases in notebooks, participating in larger trends amongst merchants and scholars to record information and to organise knowledge in forms that were systematic and novel.<sup>5</sup> This was the first age of 'information overload', and notebooks were one tool for making order.<sup>6</sup> In the second half of the seventeenth century, early modern virtuosi developed methods for cultivating memory as well as keeping notebooks. They modeled their techniques on those of ancient authorities and humanistic scholars and transformed them into long-term enterprises of data collection and collaborative study.<sup>7</sup> Notes and notebooks followed conventions, but the habits of speech, writing, and collecting that produced them were also idiosyncratic.<sup>8</sup>

Early modern medical practitioners, with the exceptions of those who worked in hospitals and other charitable foundations, worked in private practice. They conducted consultations in person, often in the patient's home, or through messages or letters. Those who chose to record their cases borrowed forms of diaries, registers or testimonials. It was typical to note the patient's name, age, complaint, its causes, a prescription or a payment. Some practitioners made mental or rough notes, perhaps even on erasable wax tablets<sup>9</sup>, as the basis for a full records that would be written up at the end of the day. Some only recorded particularly extraordinary cases, and others kept diaries of all of their cases, producing a serial record of practice. These serial records of practice are what have come to be called casebooks.<sup>10</sup> Whether these records took the form of

diaries, registers or testimonials, they were often later ordered, through indexing or commonplacing, by patient, disease or cure, providing the basis for medical observations, sometimes printed as a testimony to a doctor's expertise as well as his contribution to the advancement of learning. Observation, as Gianna Pomata has argued, formed an 'epistemic genre', meaning a 'style of knowing' rooted in a particular scholarly form.<sup>11</sup> By the late seventeenth century the practice of keeping records had become more common though not necessarily more codified.

Medical observations constructed narratives, registers produced lists and tables, and all forms of early modern medical records followed conventions and formulae.<sup>12</sup> Recent scholarship has considered sixteenth- and seventeenth-century doctors' resurgent interest in constructing particular cases and cures, and the shift from cases demonstrating a physician's successful cure to cases written with attention to the patient and the disease.<sup>13</sup> More work needs to be done on the systematic records of diseases that developed into Baconian medicine, most notably by Thomas Sydenham, known as the English Hippocrates. Shifting the emphasis from epistemology to practice, in a study that surveys the extant early modern English casebooks together with practitioners' reflections on their record-keeping practices, I have argued that the processes of record-keeping were integral to medical consultations, even when the notes were recorded after-the-fact. As ritualised displays and embodied knowledge, casebooks shaped the medical encounters that they recorded. The techniques and technologies that produced casebooks, from memoranda to printed observations, are as much a part of the history of medicine as the encounters that they document.<sup>14</sup>

A couple of decades after Italian doctors began to record their practices, Simon Forman, a self-taught London astrologer, started the first of a series of notebooks that would become one of the largest surviving sets of medical records in history. He taught his art to Richard Napier, a Buckinghamshire divine, and together they and their assistants recorded 80,000 consultations between 1596 and 1634. The majority concern questions about health and illness. These casebooks were produced during the consultation, which typically took place in the astrologer's study, where he received his clients or their messages. The astrologer recorded the patient's name, age, sex, address, and the question asked in his open notebooks. Next, he cast an astrological chart, mapping the position of the stars at the moment when the question was asked. This informed his judgment of the cause of the disease, along with ancillary, and often competing evidence from the patient's account ('she supposeth') and other signs. Some cases also include details of prescribed treatments and payments received. Forman followed this routine until his death in 1611, though not all of his casebooks survive, and Napier continued until 1634, producing a complete run of his forty-year practice.<sup>15</sup>

We do not know for certain why Forman and Napier recorded such systematic records, nor why they retained them. We do know that because the astrologers needed to cast a chart for the moment at which the question was asked or the message arrived, they worked with a pen in hand; this may have fuelled their writing habits. We also know that the astrologers were participating in broader trends to produce, retain and re-use various forms of written records. The systematic nature of Forman's and Napier's casebooks, and their massive scale, led me to design a project to digitise them. I had thought that digital tools

would provide a means of mastering the evidence in this unwieldy archive. Instead I have found that working with digital technologies raises as many questions about historical evidence as it answers. Paper technologies teach us about digital technologies, and vice versa. Before explaining the project and its lessons, we need to consider the promise that medical records in general, and Forman's and Napier's records in particular, have held for the history of medicine.

## II. Medical records and the history of medicine

Medical records began to be used by historians of medicine in earnest in the 1980s, with the rise of social history and the turn to the patient. Calls for the history of medicine to include all aspects of medical provision, including patient's experiences, had been issued at least from the 1930s.<sup>16</sup> But, as Flurin Condrau has sketched, a pair of seminal articles on the patient, one by Roy Porter, a medical historian, the other by David Armstrong, a medical sociologist, were published in the 1980s, coinciding with increasing social, political and medical concern about patient's rights.<sup>17</sup> Porter's 'The Patient's View: Doing Medical History from Below' (1985) centres on Samuel Pepys, the great seventeenth-century diarist, to argue for a shift to the patient's perspective, largely through forms of life-writing.<sup>18</sup> Armstrong's similarly titled 'The Patient's View' (1984) proposed a very different methodology, following the writings of Michel Foucault which posited the patient as a medical construct.<sup>19</sup> While agreeing that the patient was an important subject of study, Porter and Armstrong present competing views about what such a history entailed.

For Foucault, the clinical gaze of eighteenth-century hospital medicine produced the medical subject. This is part of a larger history of the body as a site of knowledge and power, often understood in terms of biopolitics and governmentality. The shift from a pre-modern to a modern, medicalised subjectivity that Foucault hypothesized was schematised by Nicholas Jewson, another sociologist, in an essay published in 1976. Building on Erwin Ackerknecht's writings about what doctors do, Jewson charted the modes of production of medical knowledge, positing the 'disappearance of the sick man' with the transitions from bedside to hospital to laboratory medicine in the decades between 1770 to 1870. Bedside medicine perceived the sick man as a person and listened to his 'verbal analysis of subjectively defined sensations and feelings', hospital medicine saw him as a case to be classified through physical examination of observable organic structures, and laboratory medicine used remote techniques to assess not a person, but a complex of cells. In this scheme, the medical encounter took a variety of forms, each establishing a different dynamic between patients and practitioners. The patient's narrative, what Jewson calls his 'self report of the course of his illness', only featured in bedside medicine. Without reflecting explicitly on the nature of paper technologies, as would historians in later decades, Jewson credited hospitals with producing systematic and quantifiable case records and, from them, collections of observable data.<sup>20</sup>

Porter conceptualised patients differently. Patients and practitioners were part of a system, and 'sufferers' articulated their experiences in diaries and autobiographies. He dismissed Foucauldian analysis as ahistorical and advocated instead, in a tradition of Marxist history, empirical work to find and study

repositories of lost voices. For the sociologically and anthropologically minded, the problem with the patient's voice was not simply that it was lost, but that it was always a discursive construct. These discussions, as Condrau notes, had little methodological purchase in the history of medicine. Studies either focused on medical practice, sidestepping the silent patient as an unknowable construct, or uncritically unearthed the sufferer from the archives. Two important works that focus on the evidence of the patient's experiences of illness and healing in medical records—Michael MacDonald's *Mystical Bedlam: Madness, Anxiety and Healing in Seventeenth-Century England* (1981) and Barbara Duden's *The Woman Beneath the Skin: A Doctor's Patients in Eighteenth-Century Germany* (1991 [1987])—complicate this picture, as will be discussed in the next section. Nonetheless, as Condrau suggests, historians of medicine need critically to reassess the old categories of patient, knowledge and disease.

Where historians of medicine have failed to address conceptual problems about how to study the patient, in other fields the patient and narratives of illness and healing have become central concerns. Within medical humanities, in the language of the editors of this volume, the medical encounter assumed the status of a 'primal event'. The merits of understanding the medical encounter as a site that produces narratives of illness and healing, and of fostering an ethical imperative to cultivate the patient's voice, is now debated. One aspect of the debates centres on whether narrative is an inherent human response or a conventional construct, shaped by historical and cultural forces, distinct from subjective experience, and itself a product of the hegemony of naturalising biomedical sciences.<sup>21</sup> From my perspective, narrative practices and meanings themselves have histories, rooted in Judeo-Christian models of the body as a

hydraulic system vulnerable to corruption and cleansed through confession and exorcism.<sup>22</sup> Just as narrative needs to be historicised, so the medical encounter needs to be understood within a broader history of the social and cosmological dynamics of healing. Models of the medical encounter which postulate a shift from doctors who listen to their patients to doctors who do not, it seems to me, fail to account for the complex of signs, verbal, physical, social and cosmological within which illness and healing have so often been inscribed. The astrologer physicians, as we will see, listened to a patient's question and judged the causes of the disease from the positions of the stars. They also noted when evidence from the patient's body or report told a different story.

With the turn to the patient in the 1980s, casebooks, like letters, diaries and other ego-documents, promised a bottom up view of illness and healing.<sup>23</sup> The books by MacDonald and Duden held out much promise for the use of medical records and the related genre of medical observations to write fresh histories of medicine. MacDonald's *Mystical Bedlam* centres on the records of madness in Napier's casebooks. Duden's *The Woman Beneath the Skin* studies the multi-volume observations on the diseases of women by Johann Storch, an early eighteenth-century German physician. While Napier's casebooks were formulaic and chronologically ordered, Storch's presented a synoptic view of the women's cases, juxtaposing the events that the women recounted to him with stories from other sources. Duden recovers a form of medical encounter in which illness and women's bodies were socially located, known to the women and accessible to the doctor through their spoken words and bodily signs. As Duden comments on MacDonald's work, it shows 'the presence of a body internally undivided and externally unbounded', a precursor to '[t]he "body" as a discrete object of social

control'. Storch and Napier, though working almost a century apart and in different locales, similarly documented an era before the natural body had taken shape. This was a moment in history when, to extrapolate Duden's argument, doctors' writing could be embodied.<sup>24</sup>

Casebooks and observations seemed ideally suited to MacDonald's and Duden's methodological imperatives to study the body as a discursive formation. In a brief preface to *Mystical Bedlam*, MacDonald acknowledges his debt to Foucault. He did not set out to rewrite *Madness and Civilization* 'in plain and tangible form.' Rather, he tried to discover how 'popular beliefs about insanity and healing illuminate the mental world of ordinary people.' While Foucault echoes the sound and fury in writings by intellectuals and officials, MacDonald, through the mass of data in Napier's casebooks, recovers the plight of '2000 obscure rustics'.<sup>25</sup> His evidence is mundane and ordinary, and he uses innovative computational techniques alongside discursive analysis to understand it.

MacDonald's and Duden's works heralded the possibilities of using documents produced within a medical encounter to understand the social and cultural practices through which minds and bodies are defined. Yet thirty years later, Roger Cooter lamented that, although the social history of medicine in the UK was thriving at the institutional level, the discipline was intellectually moribund. It was failing to address the conceptual challenge at its core: 'medicine objectified the body, history objectified the past.' In their efforts to historicise the patient, Cooter argues, historians of medicine reified the body.<sup>26</sup> The critical lessons of MacDonald and Duden had not been heeded, while medical records continued to be promoted as a vital source for the history of medicine.

In 1992, Gunter Risse and John Harley Warner challenged historians of medicine to make full use of patient records to study the dynamics of medical practice and, where possible, to recover patients' voices mediated through practitioners' pens. They began with Ackerknecht's 1967 call for 'behaviorist' studies of medical therapeutics, through case histories, and note that it had taken two decades for such work to take root. They define the variety of documents, both personal and institutional, that constitute medical records: case histories, clinical charts, patient notes. Medical records from the sixteenth and seventeenth centuries, including Napier's, are noted in their account, but their discussion centres on the late eighteenth century onwards. They note that these records are rich with quantitative and qualitative—data and narrative—material, and caution that they should not be read as clear, objective chronicles or unmediated accounts of patient experiences. Case histories, they stress, were narratives, written within analytic frameworks that are themselves politically, ideologically and personally specific.<sup>27</sup> With these provisos, they detail the opportunities for using medical records to study the histories of medical practice, the demographics of disease, social and cultural difference and healing, and the relation between medical practices and scientific ideas. Warner revisited the topic in 1999, reiterating the link between an interest in patient records and the more general trends amongst historians to study practice, to attend to narrative, and to identify new historical sources, and he urges historians to consider the form that such records take as part of the project of studying their contents.<sup>28</sup> The first task for anyone who wants to use medical records is to recognize that they are a form of writing with a distinct history.

Medical records range in form from lists of repeated categories of data to various sorts of narratives. As bundles of data, they can be readily quantified, providing apparently objective statistics about patient demographics and categories of disease. Casebooks and computing, Risse and Warner note, have long been associated. Their quintessential historian, in the persona of MacDonald, risked being buried under mountains of computer printouts. As a pioneer of historical computing, he used punched notecards, knitting needles and a mainframe computer to calculate data from a sample of two thousand cases of patients suffering from forms of mental disorders. His student, Ronald Sawyer, followed him, studying the disease profile of Napier's medical practice as a whole through sampling successive months in successive years, e.g. January 1601, February 1602 etc.<sup>29</sup> Napier's casebooks contain countable data, and they record narrative sequences, often expressed in terms of causal events. These records were framed within conventions of writing narratives and collecting data; they are not, as we will see, unmediated records of experiences of illness and healing.

The Casebooks Project is inspired by MacDonald's methods. It is also motivated by Porter's call for the recovery of lost voices and informed by Duden's challenge to the natural body. MacDonald used a mainframe, in my initial work on Forman I used a laptop and a spreadsheet<sup>30</sup>, the Casebooks Project uses XML and programs for processing its data and metadata. This is an example of what Tim Hitchcock has referred to as the use of computers to address the 'human contents' of the past, to recover the voices of ordinary people which are lost to conventional historical scholarship.<sup>31</sup> The rest of this chapter is

about the lessons of using digital technologies to make sense of the astrologers' paper technologies.

### III. Digitising medical records

How do we understand a series of 80,000 consultations ordered only, and not always, by the sequence of minutes, hours and days on which they were recorded? They are systematic records, detailing data about thousands of patients, and they are extensive, often heart-wrenching or baffling traces of exchanges between patients and practitioners, sometimes extending across decades and encompassing families and households. They require quantitative tools to navigate their expanse, and qualitative understanding to interpret their meaning.

For each case, the Casebooks Project transcribes the question, and codes details about the full case. The edited text for each entry ranges from five to fifty words, with roughly six times this much metadata to record the attributes and content of the case and thereby allow users to draw systematically on the content of the edition. This is work in progress. When it is complete, the edition will contain the edited question from all 80,000 consultations, filling an estimated 3.5 million words, coded with six times this much metadata. The edition also includes an image archive of the full run of manuscripts of the casebooks. The edition is mounted on an open-access website that contains introductions to the manuscripts, guides to reading the texts and searching the edition, and information about the astrologers and their record-keeping practices, along with detailed editorial guidelines. Our full data, marked up in XML, can also be downloaded.<sup>32</sup> Casebooks produces data and text, and it, like a

number of other projects, sits at the interface between cutting-edge digital humanities and traditional textual editing.<sup>33</sup> It is also born of new kinds of work. Instead of sitting in a library and writing a book, I have designed a project, secured a grant and assembled an expert team who are coding the data and producing a digital edition.<sup>34</sup> Without Michael Hawkins, Robert Ralley, John Young, and, from 2014, Joanne Edge, Janet Yvonne Martin-Portugues and Natalie Kaoukji this work would not be possible. Our audiences are defined as users, not readers, and one of the challenges of the project is to tutor them in engaging critically with the casebooks.

In working on the Casebooks Project, two questions about evidence have come to the fore. What does it mean to render textual material, which is three dimensional, analogue, and often narrative, into a digital format? This process has the potential to draw attention to, rather than to efface, the material nature of the original artefact, in this case a volume of bound manuscript notebooks. With digital tools we can navigate this expanse of papers from our desks. Implicit in this metaphor of visual manoeuvrability is the second question. Digital technologies allow us with relative ease to amass and manipulate large quantities of data. The dominant mode for expressing this is in visual maps, charts or other tools. What does it mean to be able to see data? These questions about the form of evidence and its representation and manipulation are as important for medical history and medical humanities as they are for digital history and digital humanities.

### Materiality

A skeuomorph is something that copies the design of an object in a new material while preserving the appearance of the original fabrication, like a wood-effect melamine desk.<sup>35</sup> The word was coined more than a century ago, and in recent decades has been appropriated and adapted (some say erroneously) to refer to the use of visual metaphors in computer interfaces. The 'keyboard' on a digital tablet is an example. Skeuomorphic design is controversial, and may have cognitive and intuitive import as well as being a matter of taste. As designs for games that emulate the feel of paper show, it is not just historians who have a fetish for dry, flat, word-laden things.<sup>36</sup> The digital is not the enemy of the material.

The rise of digital technologies has coincided with an increasing reflexivity about the nature of visual evidence and material objects. Part of the rise of cultural history, driven by anthropological inquiry, is to consider the ritual of past practices. For historians, this required imagining past scenarios, peopled with actors whose voices are now silent and furnished with props that are long since lost. Material artefacts, including written words and the books and manuscripts and other artefacts that contained them increasingly have come to be seen as objects of social as well intellectual exchange; sources of knowledge, from cheap print to family archives, are themselves objects of inquiry. Much of the history of books and readers charts the ways in which ordinary, often anonymous people make use of books. An artefact such as a book with writing in the white spaces of the margins and endpapers is often the sole testament of a set of past practices.<sup>37</sup> Materiality enacts and embodies processes. For critical scholarship it needs to be understood, as Katherine Hayles argues, as 'the interplay between a text's physical characteristic and its signifying strategies.'

Materiality provides connections—across time and space, between the physical and the mental, from artefacts to users.<sup>38</sup>

Where digital tools are being used for scholarly editing, they follow a long tradition of attention to the physical characteristics of texts in many forms. Techniques of digital collation, for instance, are being developed.<sup>39</sup> And as digital tools have begun to capture images as well as text, digital editors have come to understand—as analogue editors have known for a long time—that editing makes the material nature of texts all the more evident. Editing converts a text, it changes it, and in every conversion something is lost and something is gained. As Andrew Prescott says, using digital technologies does not mean losing your soul in a sea of data.<sup>40</sup> Digital tools provide a means of capitalising on the materiality of the sources that they treat.

Each digital humanities project has its own story about the relationship between the digital production and the material artefacts from which they derive. Many digital editing projects, like conventional printed editions, do not contain images of the original sources. This is usually a pragmatic constraint, dictated by the costs of imaging as well as the wishes of the owners of the records. Projects based in libraries or archives, in contrast, are object-centred, often producing digital surrogates of texts.<sup>41</sup> Whatever form a project takes, digitisation shapes volumes and collections, rendering something made of paper, ink and other materials into something seen and manipulated on a screen.

Forman's and Napier's casebooks fill 30,000 pages, now bound in 64 volumes. They are the residue of oral and written transactions for which no other evidence survives. When Elias Ashmole collected and bound the astrologers' papers and gifted them as part of a collection to the University of

Oxford, the casebooks became static monuments of the events that produced them. The astrologers filled their notebooks, hour by hour, day by day and, accordingly, their records follow daily routines, seasonal calendars and celestial motions. The only order to these records is their daily sequence, into which the astrologers' and their clients' habits are inscribed. Breaks, repetitions, insertions in the sequence carry meaning about these patterns of behavior and about the astrologers' recording practices. The casebooks chart chronological, lived time, and they embodied forms of written, social time; often, but not always, they coincide.<sup>42</sup> The edition captures both kinds of time, preserving the order of the cases in which they were written and the events that they record.<sup>43</sup> The project makes it possible to read the cases according to their sequence on the page, following the astrologer's calendar. It also allows the cases to be read by date, following the events in the lives of the astrologers and their clients. Through the digital edition, we can see the orders of time that bound medical encounters.

### Visualising data

To see across time is a metaphor. Visual tropes are fuelled by digital technologies, and visual evidence is now at a premium. Digital work allows us, at our computers, to see old books, either as poor facsimiles from microfilms or in high-resolution images reconstituted into books to be leafed through in an image reader. We can see a seventeenth-century library and the streets of Elizabethan London reconstructed.<sup>44</sup> We can even, in a rare and much-needed effort to move beyond the visual, hear a seventeenth-century sermon.<sup>45</sup> Meaning is conveyed in how things look, but seeing is not knowing or understanding. Seeing, like reading, is a critical skill that needs to be cultivated. Personal computers,

through access to vast amounts of information, have fostered a culture of what we might call pseudomniscience, a false sense that we have total knowledge.<sup>46</sup> Pseudomniscience risks degrading knowledge to information and corroding critical scholarship. One of the challenges for digital humanities is to ensure that features which are impressionistic become analytically operable. Visual tropes, as mapmakers, statisticians and demographers have long known, need to be used with the same critical attention as other forms of evidence.

Yet, as Joanna Drucker has argued, the standard data visualisation tools used within digital humanities are borrowed from the natural and social sciences. These carry with them assumptions about objective and certain evidence. Data, Drucker argues, presumes a scientific lens, and instead we should recognise that in the humanities we are dealing in 'capta', evidence that is taken and constructed, not, like data, given. Observation and experience produce ambiguity and uncertainty, and we need a graphics which captures these qualities.<sup>47</sup> Drucker's argument includes work on semantic analysis, and provides a framework for understanding the evidence produced by corpus and computational linguists using data mapping, text mining and other forms of semantic analysis.<sup>48</sup> Old fashioned, sentence-by-sentence, 'intrinsic' reading is qualitative; 'extrinsic' reading produces data about the occurrence of words and phrases. Data of course has a history, and the danger of Drucker's distinction between data and capta is that by distinguishing between evidence that is given and evidence that is taken, she undermines her argument that all data are in fact capta. The concept of data itself has a rhetorical function, evident, Daniel Rosenberg argues, in the history of the English term. 'Data' came into usage in the mid seventeenth century and shifted connotation in the eighteenth, 'from

those things that are outside of any possible process of discovery to being the very paradigm of what one seeks through experiment and observation.'<sup>49</sup>

I began to interrogate the meaning of visual tropes and of graphical displays of data as I began to reflect on the ambition of the Casebooks Project to enable users to search and navigate the full corpus of records, to zoom in on a particular individual, community, cohort, or topic of question, and zoom out to situate such findings in relation to the full corpus of data. The process of editing Forman's and Napier's casebooks was turning them from data inscribed on a page within an astrological system into digital data coded according to categories intended to represent the social and medical experiences of the astrologers and their clients. Visual representations—maps, charts—would render arcane astrological manuscripts into meaningful evidence for the writing of history. The danger, however, was that data visualization would privilege the quantitative over the qualitative and the certain over the uncertain and undermine the nature of the records as documents produced as part of a series of medical encounters that enacted somatic and stellar correspondences and captured data and voice every time someone asked the astrologer 'What is my disease?'

The Casebooks Project is an experiment in using digital technologies to understand paper technologies. Like a conventional editing project, it centres on a textual artefact. It situates Forman's and Napier's casebooks within early modern conventions of writing and recording. It participates in established traditions of scholarly editing and new practices of digital editing. It engages with concerns amongst historians and sociologists of medicine about the history of the patient, the medical encounter and illness narratives. It asks fundamental

questions about the kinds of evidence—data and narrative, quotation and graph—that can be used to write histories of medicine. It does all of these things in an effort to make these inscribed products of the medical fortunes of thousands of people in the past accessible and meaningful, enabling its users to navigate the somatic and social worlds of four hundred years ago, and tutoring them in the kinds of critical questions that one can now ask of these extraordinary documents.

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## NOTES

<sup>1</sup> Ann M. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (Yale: Yale University Press, 2010); Ann Blair and Richard Yeo, ed., *Note-Taking in Early Modern Europe*, a special issue of *Intellectual History Review* 20 (2010).

<sup>2</sup> Lorraine Daston and Peter Gallison, *Objectivity* (Cambridge, MA: MIT Press, 2010); Lorraine Daston and Elizabeth Lunbeck, *Histories of Scientific Observation* (Chicago: University of Chicago Press, 2011).

<sup>3</sup> Lauren Kassell (ed.), with Michael Hawkins, Robert Ralley and John Young, *The Casebooks Project: A Digital Edition of Simon Forman's and Richard Napier's Medical Records, 1596–1634* ([www.magicandmedicine.hps.cam.ac.uk](http://www.magicandmedicine.hps.cam.ac.uk)). The project is scheduled for completion date of 2017. I use the word experiment deliberately. As Natalie Cerire argues, there are echoes of the epistemological debates about doing and knowing amongst early modern experimental philosophers in current concerns in digital humanities between working on a keyboard ('hacking'), and talking about that work ('yacking'): Natalie Cercire, 'Introduction' and 'When Digital Humanities was in Vogue', *Journal of Digital*

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*Humanities*, 1 (2011). For reflections on the historical uses of digital humanities, see Tim Hitchcock, 'Academic History Writing and its Disconnects', *Journal of Digital Humanities*, 1 (2011); Tim Hitchcock, 'Confronting the Digital: Or How Academic History Writing Lost the Plot', *Cultural and Social History*, 10 (2013), 9-23; Tim Hitchcock, 'Big Data for Dead People', [historyonics.blogspot.co.uk](http://historyonics.blogspot.co.uk), 9 December 2013.

<sup>4</sup> The term comes from Anke te Heesen, 'The Notebook. A Paper Technology', in Bruno Latour and Peter Weibel (eds.), *Making Things Public: Atmospheres of Democracy* (Cambridge, MA: MIT Press, 2005), pp. 582–89.

<sup>5</sup> Volker Hess and J. Andrew Mendelsohn, 'Case and Series: Medical Knowledge and Paper Technologies, 1600–1900,' *History of Science*, 48 (2010), 287–314; Lauren Kassell, 'Casebooks in Early Modern England: Medicine, Astrology and Written Records', *Bulletin of the History of Medicine*, 88 (2014), 595–625; Richard Yeo, *Notebooks, English Virtuosi, and Early Modern Science* (Chicago, 2014), esp. pp. 91–3.

<sup>6</sup> Blair, *Too Much to Know*; Blair and Yeo, *Note-taking*.

<sup>7</sup> Yeo, *Notebooks*.

<sup>8</sup> See for instance Isabelle Charmantier and Staffan Müller-Wille, 'Carl Linnaeus's botanical paper slips (1767–1773)', *Intellectual History Review*, 24 (2014), 1–24.

<sup>9</sup> Peter Stallybrass, Roger Chartier, J. Franklin Mowery, and Heather Wolfe, 'Hamlet's Tables and the Technologies of Writing in Renaissance England', *Shakespeare Quarterly*, 55 (2004), 379–419, esp. 403.

<sup>10</sup> Kassell, 'Casebooks'.

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<sup>11</sup> Gianna Pomata, 'Observation Rising: Birth of an Epistemic Genre, c. 1500–1650', in Daston and Lunbeck (eds.), *Histories of Scientific Observation*, pp. 54–66.

<sup>12</sup> Hess and Mendelsohn, 'Case and Series'.

<sup>13</sup> Jole Agrimi and Chiara Crisciani, *Les Consilia Médicaux*, trans. Caroline Viola.

Typologie des sources du Moyen Age occidental, no. 69. Institut d'Etudes Médiévales, Université Catholique de Louvain (Turnhout, Belgium: Brepols, 1994); Chiara Crisciani, 'Histories, Stories, *Exempla*, and Anecdotes: Michele Savonarola from Latin to Vernacular', in Gianna Pomata and Nancy Siraisi (eds.), *Historia: Empiricism and Erudition in Early Modern Europe* (Cambridge, MA: MIT Press), pp. 297–324, esp. 309–11; Gianna Pomata, "Praxis Historialis: The Uses of *Historia* in Early Modern Medicine," in *Historia*, 105–46, esp. 122–36; Nancy Siraisi, *History, Medicine, and the Traditions of Renaissance Learning* (Ann Arbor: University of Michigan Press, 2007), Ch. 2.

<sup>14</sup> Kassell, 'Casebooks'.

<sup>15</sup> The second most extensive surviving set of early modern English medical records were by Theodore de Mayerne, the famous Huguenot and royal physician. He filled 3,000 pages with elaborate narratives of roughly 1,000 cases from 1603–53, probably half his total practice: Brian Nance, *The Art of Medical Portraiture: Turquet de Mayerne as Baroque Physician* (Amsterdam: Rodopi, 2001).

<sup>16</sup> Charles Webster, 'Medicine as Social History: Changing Ideas on Doctors and Patients in the Age of Shakespeare', in Lloyd G. Stevenson (ed.), *A Celebration of Medical History* (Baltimore: Johns Hopkins University Press, 1982), pp. 103–26.

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<sup>17</sup> Flurin Condrau, 'The Patient's View Meets the Clinical Gaze', *Social History of Medicine*, 20 (2007), pp. 525–40.

<sup>18</sup> Roy Porter, 'The Patient's View: Doing Medical History from Below', *Theory and Society*, 14 (1985), pp. 175–98. See also Roy Porter, 'The Patient in England, c.1660-c.1800', in Andrew Wear (ed.), *Medicine in Society* (Cambridge: Cambridge University Press, 1992), pp. 91–118.

<sup>19</sup> David Armstrong, 'The Patient's View', *Social Science and Medicine*, 18 (1984), pp. 737–44.

<sup>20</sup> Nicholas Jewson, 'The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870', *Sociology*, 10 (1976), 225–44. See also Mary Fissell, 'The Disappearance of the Patient's Narrative and the Invention of Hospital Medicine', in Andrew Wear and Roger French (ed.), *British Medicine in an Age of Reform*, (London: Routledge, 1991), pp. 92–109. Jewson's paper was reprinted in *International Journal of Epidemiology*, 38 (2009), 622–33 together with essays reflecting on its significance for medical sociology and the history of medicine.

<sup>21</sup> See the chapter by Brian Hurwitz, Victoria Bates, and Trisha Greenhalgh on 'Narrative, Medicine and the Humanities' in this volume. Angela Woods, 'The Limits of Narrative: Provocations for Medical Humanities', *Medical Humanities*, 37 (2011), pp. 73–78; Claire Charlotte McKechnie, 'Anxieties of Communication: the Limits of Narrative in the Medical Humanities', *Medical Humanities*, 40 (2014), 119–24.

<sup>22</sup> Anne Harrington, *The Cure Within: A History of Mind-Body Medicine* (New York: Norton, 2008); Moshe Sluhovsky, *Believe Not Every Spirit: Possession, Mysticism and Discernment in Early Modern Catholicism* (Chicago: Chicago University Press,

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2007). On the historically specific nature of the hydraulic model of the emotions, see Barbara H. Rosenwein, 'Worrying about Emotions in History', *American Historical Review*, 107 (2002), 821–45.

<sup>23</sup> Major works on the early modern patients include, Michael MacDonald, *Mystical Bedlam: Madness, Anxiety, and Healing in Seventeenth-Century England* (Cambridge: Cambridge University Press, 1981); Ronald Sawyer, 'Patients, Healers and Disease in the Southeast Midlands, 1597-1634' (PhD thesis, University of Wisconsin, 1986; Lucinda McCray Beier, *Sufferers and Healers: The Experience of Illness in Seventeenth Century England* (London: Routledge, 1987); Barbara Duden, *The Woman Beneath the Skin: A Doctor's Patients in Eighteenth-Century Germany*, trans. Thomas Dunlap (Cambridge, MA: Harvard University Press, 1991 [1987]); Dorothy Porter and Roy Porter, *Patient's Progress: Doctors and Doctoring in Eighteenth-Century England* (Oxford: Polity Press, 1989); Mary Fissell, *Patients, Power, and the Poor in Eighteenth-Century Bristol* (Cambridge: Cambridge University Press, 1991); Brian Nance, *The Art of Medical Portraiture: Turquet de Mayerne as Baroque Physician* (Amsterdam: Rodopi, 2001); Michael Stolberg, *Experiencing Illness and the Sick Body in Early Modern Europe*, trans. Leonhard Unglaub and Logan Kennedy (Basingstoke: Palgrave, 2011 [2003]); Lauren Kassell, *Medicine and Magic in Elizabethan London: Simon Forman, Astrologer, Alchemist, and Physician* (Oxford: Oxford University Press, 2005); Wendy Churchill, *Female Patients in Early Modern Britain: Gender, Diagnosis, and Treatment* (Farnham: Ashgate, 2012); Olivia Weisser, *Ill Conceived: Sickness, Gender, and Belief in Early Modern England* (New Haven, CT: Yale University Press, 2015).

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<sup>24</sup> Duden, *Woman Beneath the Skin*, p. 11. Duden makes a particular claim about the exceptional nature of Storch's writing, p. 69.

<sup>25</sup> MacDonald, *Mystical Bedlam*, p. xii.

<sup>26</sup> Roger Cooter, 'After Death/After-'Life': The Social History of Medicine in Post-Modernity', *Social History of Medicine*, 20 (2007), pp. 441–64, quotation p. 446.

<sup>27</sup> Guenter B. Risse and John Harley Warner, 'Reconstructing Clinical Activities: Patient Records in Medical History', *Social History of Medicine*, 5 (1992), pp. 183–205.

<sup>28</sup> John Harley Warner, 'The Uses of Patient Records by Historians—Patterns, Possibilities and Perplexities', *Health & History*, 1 (1999), pp. 101–11.

<sup>29</sup> Sawyer, 'Patients, Healers and Disease', p. 468 ff.

<sup>30</sup> Lauren Kassell, *Medicine and Magic in Elizabethan London: Simon Forman, Astrologer, Alchemist and Physician* (Oxford: Oxford University Press, 2005), Ch. 6.

<sup>31</sup> Hitchcock, 'Academic History Writing'; Hitchcock, 'Big Data for Dead People'.

<sup>32</sup> [github.com/CasebooksProject/casebooks-data](https://github.com/CasebooksProject/casebooks-data)

<sup>33</sup> See for instance, The Newton Project, [www.newtonproject.sussex.ac.uk](http://www.newtonproject.sussex.ac.uk); The Chymistry of Isaac Newton, [webapp1.dlib.indiana.edu/newton/](http://webapp1.dlib.indiana.edu/newton/); The Newton Project Canada, [www.isaacnewton.ca](http://www.isaacnewton.ca).

<sup>34</sup> As Ludmilla Jordanova has noted, 'Digital culture changes behavior, expectations, patterns of work and mindsets.' Jordanova, 'Historical Vision in a Digital Age', *Cultural and Social History*, 11 (2014), pp. 343–48, quotation p. 346. See also Hitchcock, 'Academic History Writing'; Adam Kirsch, 'Technology is

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Taking Over English Departments: The False Promise of the Digital Humanities', *New Republic*, 2 May 2014.

<sup>35</sup> Thanks to Mike Hawkins for teaching me this word.

<sup>36</sup> See for instance, the work of State of Play Games: [www.stateofplaygames.com](http://www.stateofplaygames.com)

<sup>37</sup> See for instance, William H. Sherman, *Used Books: Marking Readers in Renaissance England* (Philadelphia, PA: University of Pennsylvania Press, 2007).

<sup>38</sup> N. Katherine Hayles, 'Print is Flat, Code is Deep: The Importance of Media-Specific Analysis', *Poetics Today*, 25 (2004), pp. 67–90.

<sup>39</sup> See for instance, [spenserarchive.org](http://spenserarchive.org).

<sup>40</sup> Andrew Prescott, 'An Electric Current of the Imagination: What the Digital Humanities Are and What They Might Become', *Journal of Digital Humanities*, 1 (2012).

<sup>41</sup> See for instance, the Cairo Genizah, [cudl.lib.cam.ac.uk/collections/genizah](http://cudl.lib.cam.ac.uk/collections/genizah)

<sup>42</sup> On early modern time, see for instance Edward Muir, *Ritual in Early Modern Europe* (Cambridge: Cambridge University Press, 1997), Ch. 2.

<sup>43</sup> For reflections by the Technical Director and Senior Editors on the challenges of the Casebooks Project, see Michael Hawkins, Robert Ralley and John Young, 'A Medical Panorama: The Casebooks Project', *Book 2.0*, 4 (2014), pp. 61–9.

<sup>44</sup> Sarah Werner, 'Where Material Book Culture Meets Digital Humanities', *Journal of Digital Humanities*, 1 (2012); [www.youtube.com/watch?v=SPY-hr-8-M0](http://www.youtube.com/watch?v=SPY-hr-8-M0).

<sup>45</sup> [vpcp.chass.ncsu.edu/churchyard/view/](http://vpcp.chass.ncsu.edu/churchyard/view/)

<sup>46</sup> Thanks to John Young for coining this term. On myths of total knowledge, see [storify.com/CRASShive/the-total-archive-dreams-of-universal-knowledge-fr](http://storify.com/CRASShive/the-total-archive-dreams-of-universal-knowledge-fr)

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<sup>47</sup> Johanna Drucker, 'Humanities Approaches to Graphical Display', *Digital Humanities Quarterly*, 5 (2011). See also, Trevor Owens, 'Defining Data for Humanists', *Journal of Digital Humanities*, 1 (2011).

<sup>48</sup> For the use of semantic analysis within the histories of science and medicine, see for instance Irma Taavitsainen and Päivi Pahta (ed.), *Medical Writing in Early Modern England* (Cambridge: Cambridge University Press, 2010); Irma Taavitsainen and Päivi Pahta (ed.), *Early Modern English Medical Texts: Corpus Description and Studies* (Amsterdam: John Benjamins Publishing, 2010); Stephen Pumfrey, Paul Rayson and John Mariani, 'Experiments in Seventeenth Century English: Manual Versus Automatic Conceptual History', *Literary and Linguistic Computing*, 27 (2012), 395–408;  
[webapp1.dlib.indiana.edu/newton/lisa/index.php](http://webapp1.dlib.indiana.edu/newton/lisa/index.php).

<sup>49</sup> Daniel Rosenberg, 'Data before the Fact', Lisa Gitelman (ed.), *'Raw Data' is an Oxymoron* (Cambridge, MA: MIT Press, 2013), pp. 15–40, quotation p. 36.