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A New Age of Photography: ‘DIY Digitization’ in Manuscript Studies

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Abstract: Since c. 2008 many special collections libraries have allowed researchers to take photographs of medieval manuscripts: this article calls such self-service photography ‘DIY digitization’. The article considers some possible effects of this digital tool for research on book history, especially on palaeography, comparing it in particular to the effects of institutionally-led digitization. ‘DIY digitization’ does assist with access to manuscripts, but less easily and with less open data than institutional digitization does. Instead, it allows the researcher’s intellectual agenda to guide the selection of what to photograph. The photographic process thereby becomes part of the process of analysis. Photography by the researcher is therefore limited by subjectivity but it also helps to highlight the role of subjective perspectives in scholarship. It can also balance a breadth or depth of perspective in ways different from institutional digitization. It could in theory foster increased textual scholarship but in practice has fostered attention to the materiality of the text.

Key terms: digital photography, digitization, librarianship, manuscripts, materiality, palaeography, perspective

1 Photography and Manuscript Studies

1.1 Early Photography in Manuscript Studies

From the advent of photography, taking pictures became a tool for studying the history of books. The nineteenth-century pioneer photographers, perhaps challenged by the need for subjects to sit still, often experimented with images of objects. William Fox Talbot, one of the early inventors, pictured not only people

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but busts of people, as well as other things ranged on shelves.¹ Among them he captured, close up, old books: for instance, on 12 November 1839 he made a salted silver print of a fifteenth-century page of the Law French *Statutes* of England printed by William de Machlinia in 1484 (Braun and Kingsley 2015: frontispiece; Schaaf 2017). He recognized right away the use of photographs for facsimiles. Others soon seized too on the ability of images to document classical and gothic monuments at risk of ruin (Braun and Kingsley 2015: 53–57; Endres 2019: 47), and photography was used for facsimiles of manuscripts and other rare books. The books of the millennium before printing are voluminous and scattered across the libraries of many nations, and reproductions were necessary to allow scholars to access, document and analyse them. Archaic typefaces and engravings had been used to reproduce manuscripts long before (Echard 2008: 3, 19, 21–59, 120), but photography offered an improved means of reproduction. In England, for instance, the Palaeographical Society published hundreds of plates of manuscripts from 1873 onwards, and Frederick Furnivall issued thirty *Autotypes of Chaucer Manuscripts* for members of the Chaucer Society from 1876 (Spencer 2015: 618–619).²

The effect on manuscript studies was transformative. Indeed, surveying the history of palaeography, in particular, the great Ludwig Traube recognized that, along with the discovery of papyri, the invention of photography was one of the defining features of the field in the nineteenth century. He went so far as to call this era in the study of manuscripts “Das Zeitalter der Photographie” (Traube 1909: 57, ‘the age of photography’). He also imagined future developments which would make photography only more central. He dreamed of colour pictures. And he urged that the palaeographer like the art historian should learn to take photographs for himself: “der Paläograph sollte wie der Kunsthistoriker photographieren können” (Traube 1909: 60). He was already envisaging a world in which researchers would take their own photographs of manuscripts. That was highly unlikely given the cameras available in his pre-Kodak world. It is almost as though he was fantasizing of the ease of manuscript scholars using their own digital cameras today.

1 For reproductions, see Schaaf et al. (2017: nos. 85, 2610, 2531, 3643, 3664, 3862, 4023, 4375).

2 For an annotated bibliography of early facsimiles, see Boyle (1984: 23–66).

1.2 Recent Uses of Digital Photography in Manuscript Studies

For that fantasy came true: digital technology allows people who study manuscripts – and indeed other archives or rare printed books in special collections – to take pictures of those books for themselves. As well as buying facsimiles, a nineteenth-century tool, or accessing online digitizations, a twentieth-century device, the researcher in the twenty-first century makes her own manuscript images. Libraries, archives and museums were formerly wary of people photographing the manuscripts and other things in their collections. Heavy equipment could be dropped on books; large equipment could be used to smuggle out pages; the lenses clicking would disturb the scholarly hush; the flash would expose the colours to strong light. With the advent of digital cameras some of these worries went away; and with the advent of smartphones with cameras built into them, researchers came to reading rooms with a piece of equipment that could, incidentally, take pictures. From about 2008, librarians let them use these tools in reading rooms. Librarians can better tell the story how they came to change the rules (see Green, this volume). The result is simple: it is now almost universal policy that researchers in reading rooms may take their own digital photographs of medieval manuscripts, without the dangers of a flash or tripod harming the books.³ For about a decade, such photography has been a standard method of research. For shorthand, adapting a term from librarianship (Jones 2010), I call it 'DIY digitization' – do-it-yourself digitization.⁴

The digital camera has become one of the commonest digital tools employed in manuscript studies today. Indeed, because it needs less equipment, expense and expertise, making pictures with a small digital camera, smartphone or tablet is a more common experience than making high quality digitizations to mount online, and than many other techniques from the Digital Humanities. It has been said that palaeography can be resistant to new technology (Stokes 2011: 230), and people speak of a divide between traditional manuscript studies and the advanced computational palaeography that has grown up in Digital Humanities (Maniaci et al. 2011: 125; Hassner et al. 2013). But thanks to the low technical and logistical bars to entry, now many manuscript scholars use digital cameras. Every palaeographer, a photographer. Given the simplicity, one might ask whether this photography can be considered part of Digital Humanities. Those with more ad-

³ Most libraries advertise such policies on their websites. For an example of detailed guidance, see online information issued by the British Library when it introduced self-service photography: Anon. (2015) and Hamlyn (2015).

⁴ This term was chosen for a project at the Bodleian Library, Oxford, described in footnote 7 below and archived in a small website <<http://diydigitization.org/>> [accessed 30 May 2020].

vanced expertise in Digital Humanities have asked whether “all aspects of digitally supported scholarship” count as Digital Humanities (Münster and Terras 2019: 366), and some concluded that it “is not the same thing as the research field” of Digital Humanities (Booth and Posner 2020: 10). This need to define a new field exclusively might explain why this common digital activity by humanities scholars – taking photographs of books – is seldom part of the narrative about Digital Humanities.

1.3 Questions about Digital Photography in Manuscript Studies

Yet this proliferating method of research is worth some reflection. There is much brilliant commentary on institutional, organized programmes of digitizations: their loss or gain of aura, their own material properties, their utility, their ethics (e.g. Albritton, Henley and Treharne 2020). However, this other digital photography has not been the subject of much comment. Explorations of the uses of digitization mention library users’ own photography only briefly or in terms which might imply that this ‘DIY digitization’ is less important. One book-length analysis of using digitized manuscripts has only one paragraph comparing “amateur” or DIY photography with “professional” digitization, though the author notes that one “cannot detect that much difference” between their quality (Van Lit 2020: 95). Library-led digitizations are said to be “indispensable to scholars, who are increasingly supplementing them with their own images”, but it is said the scholars’ own pictures are only “supplementing” (Prescott and Hughes 2018). Bill Endres notes that one can do some image processing “even from photographs captured with a smartphone” or “even from images taken with a smartphone” (2019: 2); that repeated “even” damns the smartphone with faint praise! Endres (2019: 2) adds that “[a]dvanced imaging techniques are likely to produce much better results”, which is surely true. But while such DIY digitization is less brilliant than Endres’ superb presentation of the St Chad’s Gospels from Lichfield Cathedral, the DIY method is widely diffused and so deserves more consideration.

What are the effects on research of this process of ‘DIY digitization’? That is the question that this article asks. Michael Hanrahan and Bridget Whearty note how important it is that we treat digital images “with the same rigor that we apply to physical manuscripts and analyze their creation, reception, and reuse” (2018). There have been a few valuable observations on researchers’ own photographs. Giulio Menna (2012) has offered a warmly personal account of the physical challenges and aesthetic pleasures of taking such pictures. It is no surprise that Menna was a professional photographer before he did graduate research on manuscripts: his images are outstanding, using focus and depth of field to direct the

eye and to communicate evocatively. And in a searching analysis, Johanna M.E. Green (2018) has noted the value of images made with simple digital cameras or smartphones by librarians rather than readers, and she has argued that such pictures convey the material properties of books better than do more professional digitizations. Green's thoughtful observations suggest that researchers' own use of digital photography is likewise worth considering for the different effects it has from mass digitization. After all, smartphones, in particular, have transformed photography in ways that few predicted: as Edgar Gómez Cruz and Eric T. Meyer note, "digital technologies" are changing "the meaning of what photography is" in every facet of life (2012: 204). The digital camera in its networked form has broken down the divide between professional and amateur image-making (Moschovi, McKay and Plouviez 2013: 22). The technological ease and computational opportunities of digital photography have made photography not just the concern of the visual arts but of other disciplines, to which photography contributes as a practice of information making (Rubinstein 2020: 5). In academic life, Meyer (2007) and others have considered how easy access to digital photography has transformed other disciplines. For instance, in East Asian studies, to obviate the need for extended or repeated visits, and in collections guarded by different rules, scholars had been amassing their own photographs of manuscript sources in analogue technology long before the coming of the smartphone (Madsen 2010: 138–141). So how is this digital photography by scholars changing research in western manuscript studies?

Two effects of photography on manuscript studies were noted by Traube over a century ago, and they still pertain in the new age of photography. First, one use of photography was, even in the 1800s, as a tool for seeing manuscripts which were inaccessible, of comparing far-flung books and of showing them to others elsewhere. Manuscript studies, a site-specific sort of scholarship, became networked, interconnected, through photographs in the nineteenth century. The benefits of access to see sources seem obvious, but the effects on access of DIY imaging are more equivocal. Second, Traube also recognized that photography would make palaeographers think in new ways. It "schärft und verfeinert so das Auge des Paläographen" (Traube 1909: 58, 'greatly sharpens and refines the palaeographer's eye'). Photography is not simply a system for assembling and accessing data; it is a way of learning to look – perhaps more precisely, more sharply. It is a way of thinking. It is the effects on researching and thinking that (it is argued below) are the more significant impact of digital photography by researchers in manuscript studies.

2 Accessing Sources

2.1 Access

This DIY digitization at first glance seems to continue the longstanding endeavour by library professionals and researchers in Digital Humanities to digitize sources. Such activity ranges from capturing each folio in a simple file format to 3D and multispectral imaging and more.⁵ Some libraries have had state-of-the-art equipment: cameras of a quality few lone scholars can afford and a size few could lug to the library; cradles and weights for the books; good lighting. But some small institutions have done digitizing with the simpler tools that their readers might also use. This way for impoverished institutions to share their riches with the world has also been called “DIY digitization” (Jones 2010: 1). That makeshift method is simple enough with modern archives or ephemera, but some have even tried it with the cumbersome codices of the handwritten era. For instance, Anna Sander, former librarian of Balliol College, Oxford, began the process of digitizing many of the College’s manuscripts herself and mounted the images freely and simply on the website Flickr.⁶

Alongside this use of digital photography by professionals, some memory institutions have sought to involve their users and customers, especially non-professional enthusiasts, to gather images for them in a process of crowdsourcing, a term coined in 2005 (Terras 2016: 421). Crowdsourcing is, like researchers’ photography, made possible by new and simpler digital technology (Terras 2015a: 66–67; Terras 2010: 426). Crowdsourcing, though, as the name implies, involves people other than professional curators and researchers, and it is primarily used to amass sources. Although some kinds of crowdsourcing do involve analysis, such as crowdsourced transcription, when it involves photography, then its purpose is less interpretation than collection. Melissa Terras (2010: 428–429) described one forum for crowdsourcing images as “completionist” in its aims, and conversely suggested that many crowdsourcing projects had by 2016 “yet to produce a tangible academic outcome” (Terras 2016: 429). In this, it is more like the digitization of sources by memory institutions themselves, and helps to meet the goal of such institutions to preserve and provide resources for future analysis.

DIY photography by manuscript scholars does have an obvious use, like digitization or crowdsourcing, for easing access to sources, and access has always

⁵ For a history of methods, see Terras (2015a: 64–66, 69–70, 72–76).

⁶ See <<http://archives.balliol.ox.ac.uk/Ancient%20MSS/ancientmsslist.asp>> [accessed 31 May 2020].

been a challenge in manuscript studies. There is a growing expectation that collections, in many fields, will be digitized, but this is not the case (Terras 2015a: 79). Despite great advances, vast amounts more remain to be digitized, and it will be a long time, if ever, until this is done – and it has been suggested that the money for that could be better spent on paying for scholars' travel to see for themselves (Edwards 2013). Until then, self-service photography serves as a kind of DIY digitization: it allows people who visit a library to take pictures as souvenirs of what they have seen; it allows people to recall or to check things further later; it allows them to share their images of manuscripts with others, whatever the legal uncertainties over ownership (see Green, this volume).

2.2 Privatization and Democratization

But increasing access is not something that DIY digitization does well; in fact, it is poor at this. Tom White has called this facility a “privatization” of what could have been publically available sources (White 2020). Researchers still need to have visited the library to take the photographs, or they need contacts close to that library to take photographs on their behalf. Thus DIY digitization is helpful for people far from special collections only if they have the funds to travel or pay someone to take pictures, or have a professional network to facilitate the latter. Rather, just as using online digitizations creates a different impression depending whether one has or has not used the real thing (Van Haaren 2020), so too DIY digitization sharpens the inequalities between scholars depending on their geography or funding for access to the books themselves.

Moreover, it is not clear how one could gather and share these images online – in effect, how to crowdsource from the crowd of scholars the digitization of manuscripts. The technology might be available, but the working habits are not. In an experiment in 2015, I and colleagues at the Bodleian Library invited readers to share their photographs of its medieval manuscripts on the free website Flickr. Hardly any did; the experiment failed; and that was revealing in itself.⁷ As has been noted of other kinds of digitization, the fruits of the Digital Humanities are not always Open Access; Digital Humanities is not synonymous with Open Access (Terras 2015b: 736–737; Edwards 2013). It is important to recognize that DIY digitization only increases access to manuscript sources for some.

⁷ See <<https://www.flickr.com/groups/bodspecialcollections>> [accessed 31 May 2020] and Stanford (2016). This experiment was devised by me with Dr Christine Madsen and Dr Judith Siefring, at the time both digital curators at the Bodleian Library. Green (2018, n 35) comments on this experiment.

Yet there is one way in which DIY digitization opens up resources: it democratizes the making of digital ones. It takes the control of the means of reproduction away from institutions – libraries or established and funded collaborative projects – and is thus free from their intellectual agendas – however well researched, intellectually defensible or widely useful those agendas often are. With a digital tool made by an institution or project team, the “end user is at the mercy of the team” who devised the digitization; this makes any other user’s analysis “less precise” as “rarely can two projects be done the same way or two sources be studied and analyzed uniformly” (Van Lit 2020: 119). By contrast, DIY digitization allows a process of democratization or wider empowerment in deciding which sources to document and how. This is akin to the democratization sometimes seen in crowdsourcing (Terras 2010: 426), but as the process is not directed by any institution, then the democratization is more centrifugal. This is in part a reflection of the relative ease of digital photography and the smartphone in particular. Whatever the concerns about corporate control, it is often said to have democratized what is considered worthy of photographing, for instance, the mundane and everyday (Gómez Cruz and Meyer 2012: 211–214, 217). This is true of the images used in research too: the choice of what to picture is now shared. Although they capture very different objects, a useful comparison for DIY photographs of manuscripts are screenshots, employed in fields of contemporary cultural or political critique to capture and critique fast-moving and contentious sources online, such as Tweets. There are other excellent methods for analysing the flow of language online, but the value of screenshots is, as Meredith D. Clark notes, “their relatively unfussy nature. There are no coding languages to learn, no programs requiring that computers be left running uninterrupted” (2020: 204). Those low financial and technical barriers to making screenshots are empowering. Similarly with DIY digitization, it is easier for scholars to make records of manuscripts for themselves, according to their own agenda and with minimal equipment or expertise.⁸ It is the very privateness or, at least, solitariness of this technology that transforms the personnel of digitization and transforms the choices about what is digitized.

⁸ That said, it still requires some equipment: even smartphones are inaccessible to some users, and they have their own material conditions – costs, supply chains, corporate control, data privacy – which could be considered further.

3 Managing Data

3.1 Assembling Data

Thus the assembling of resources is shaped strongly by the scholar's own intellectual perspective, and the taking of pictures becomes an analytical act. This has been one of the changes recognized in digital photography in general: the process of planning what one's images will later show, enabled by the ease of digital photographic technology (Muellner 2013: 78). And this is central to the Digital Humanities in general, where often "the dataset is the work", as Alison Booth and Miriam Posner put it (2020: 20). As Bill Endres (2017: 51–52) notes, "making" is a form of "knowing" not only in the advanced skills of coding, the usual "making" in Digital Humanities, but in other forms of academic "building", even in writing. This is true, I suggest, not only of large datasets but also of the photographs taken by researchers. Assembling a data set is not preliminary to analysis; it depends on an analysis, articulated or otherwise, of what is worth gathering and why. Even taking pictures requires thought; you cannot just point and shoot.

Recognizing the analysis inherent in building a dataset allows one to recognize the thought in the collections of photographs made by manuscript researchers. It also allows one to recognize that the selectiveness of such collections is not a defect, as it would be in a resource for shared access, but is a conscious assemblage. It might be prompted by the lack of the time and resources of a team project: few lone researchers meticulously photograph every page of one book, let alone every book in a library.⁹ Instead, researchers select the few manuscripts, among the many thousands surviving, of interest to them; and they photograph only selected parts. This is true of institutional digitization as well. With the exception of some all-encompassing schemes, such as *OPENN* or *Parker-on-the-Web* which capture every handwritten book in one or more libraries,¹⁰ often digitization by major libraries covers only a few of their books, whether celebrities, treasures and canonical authorities, or historically defined corpora from particular places, languages or times.¹¹ The choice tends to be driven by various political,

⁹ This was evident in the images uploaded to <<https://www.flickr.com/groups/bodspecialcollections>> (see n 7 above).

¹⁰ For details, see <<http://openn.library.upenn.edu/>> [accessed 31 May 2020] and <<https://parker.stanford.edu/parker/>> [accessed 31 May 2020]. For analysis of the effects of *Parker-on-the-Web*, see Albritton, Henley and Treharne (2020).

¹¹ E.g. the excellent projects funded by the Polonsky Foundation: <<https://manuscrits-france-angleterre.org/polonsky/en/content/accueil-en?mode=desktop>> [accessed 31 May 2020] and <<https://hab.bodleian.ox.ac.uk/de/>> [accessed 31 May 2020].

economic and academic concerns. While it might not have that quality or quantity, DIY digitization is similar in its selectiveness.

3.2 Selecting Data

Photography is always a means of selecting what matters. The great critic of the medium, Susan Sontag, notes that what we photograph reflects our prior conceptions of what is important: “it is never photographic evidence which can construct – more properly, identify – events; the contribution of photography always follows the naming of the event” (2008: 119). Each scholar photographs what matters for her research, and that makes her pictures useful primarily to herself. This lessens the usefulness of her images to others, increasing their sense of knowledge “privatized”, but it also lessens the loss to others if these images are not openly accessible. To give a personal example: from research for a monograph on scribal correcting (Wakelin 2014) I have hundreds of photographs of short passages of text, each with a correction by some scribe or reader. These pictures of words were crucial for that project but too close up and too focused on text when I began to research an exhibition and catalogue on page layout (Wakelin 2018). They reflect my sense of the importance of the textual cruces – and of the importance of particular texts in which I sought such cruces – for one particular project. Thus, taking pictures, more than looking at pictures selected and taken by others, involves building an argument, developing a set of ideas, establishing a corpus which expresses one’s sense of priorities in research. The perspectives which limit one’s choice of what to photograph are not the problem but the purpose of what has been called, of sets of screenshots, a “purposive data set” (Clark 2020: 205). The photographer’s “positionality” or “abilities to read multiple meanings in the visual artifacts and texts [. . .] and give meaning to the phenomena under study” is what is valuable in such collections (Clark 2020: 204–205).

The selection of which parts of manuscripts to photograph might be determined by pre-existing areas of scholarly debate, whether the photographs enshrine prior categories or are used to challenge them. For instance, reproducing a complete sequence of pages might provide a copy of a previously known text for transcription and editing. Given the debated attributions of manuscript texts and their often uncertain boundaries in miscellanies, which folios one photographs will depend on prior scholarship or one’s own prior deductions about the work. Similarly, a decision to photograph specimens of a certain style of script will depend on some pre-existing sense of the boundaries between one style and another, which will be formed by the classifications refined by generations of palaeographers. Or the categories employed to select examples might not be shared

with all palaeographers, who sometimes differ in their sorting and labelling of scripts. The choice of what to photograph could be a polemical way to suggest likeness between specimens considered unlike, to highlight letterforms or pen-strokes which disrupt the usual classification of script in manuals of palaeography with the variability of practice page by page. As Peter A. Stokes noted of more advanced photographic datasets (2012: 147–148), the process of refining hands into categories of script looks problematic with a proliferation of photography.

Sometimes the selection of materials is determined in a more improvisatory way during the process of looking, and by more individual intellectual categories. Scattered shots of few folios might capture all the annotations by just one person of interest, as research on the book identifies a particular reader's intelligent use of the margins. It can be a way to check one's sense that all these marginalia were by one hand – hard to identify in the cramped script that fits in margins – and a way to rethink later what that hand had annotated by rereading and tracing in context the passages marked. Or multiple pictures from manuscripts of seemingly unrelated kinds might make sense to a codicologist collecting specimens of book binding, say: the books might have a similar pattern of sewing stations or a blind-stamp revelatory of production in some town, for instance, in a way barely visible in the mass of wider digitizations but suddenly evident by selecting and sharing few images side by side. Recognition and interpretation are needed to select what to photograph, and this gives those photographs not less value but more to those able to recognize and interpret the resulting selection.

3.3 The Limitations of Digital Photographs

Incidentally, some of these features might be less discernible in the better lit digitizations produced professionally, which could make it hard to see the shifts in ink colour between annotators, or the tiny holes for sewing. A reading room's wintry light and a reader's awkward angle or zoom might reveal these things better. Several have noted (e.g. Hanrahan and Whearty 2018; Endres 2019: 33) the flattening effect of high-quality digitizations, where colours are carefully controlled, and where the unevenness of parchment is smoothed out by plastic holding strips. By contrast, the roughness of self-service digital pictures varies the perspectives, both visual and intellectual, from which a book can be seen. The poor quality and duplication of self-service photography of manuscripts have the unintended benefit that they challenge the idea of a single and perfect reproduction. One example might be the effort to capture bits of text in the gutters of manuscripts; some 'flat' digitizations do lose that, but the researcher can zoom in and find these markings, which might be most germane to her work, and if the photo-

graph is imperfect in capturing the curved, shaded words close to the spine, then that too is instructive about the book's scale, the awkwardness of annotating in bound books, the sense that the book must have been approached and handled by its annotators not always at a perfect perpendicular and all-seeing angle. Indeed, most manuscripts were not seen under good lighting or laid flat, and DIY digitization might capture a less anachronistic impression of how books were seen in the past.

The technical limitations of mass digitization must not be overstated, though; those of DIY digitization are greater. And the uniformity and flatness of mass digitization can be disrupted, if libraries or researchers essay multiple digitizations of the same manuscripts from different angles or with different tools (Prescott and Hughes 2018); some imaginative projects, such as the work of Endres (2019), have tried exactly that. Even then, though, self-service photography offers a rebuke to the professional kind. It is axiomatic that any digitization can reveal only a few characteristics or one person's perspective (Terras 2015a: 68), for "no one photograph captures THE scientific objective view" (Endres 2019: 6). But it has been suggested that high quality digitization risks seeking after "the fiction of some ideal digital surrogate" and "reinscribing the fictions of universal ways of knowing" (Altschuler and Weimer 2020: 86). DIY digital photographs are a valuable complement to professional digitization in preventing such universality: not only do they supplement specific points-of-view; they also remind the viewer, by their variety, that all representations of manuscripts represent only one particular perspective. Recognizing this perspectival bias is, oddly, one of the benefits of digitizing for yourself.

4 Perspectives

4.1 Subjective Perspectives

That does raise questions about one rationale for using photography in manuscript studies, one mentioned most often in one central part of such study: palaeography, strictly speaking the history of script, along with dating, placing and identifying scribes. Palaeographers often note the tension in their field between "objective and subjective arguments" (Van Lit 2020: 102). Peter A. Stokes in particular has warned of "the problem [. . .] that palaeographers tend to express qualitative opinions rather than objective arguments and to issue pronouncements that cannot be debated or engaged with meaningfully" (2009: 311). It is true that such authoritative "pronouncements" carry too much weight in this area of manuscript studies: too many footnotes are reports of *ex cathedra* verdicts

(‘Professor X says it looks to him to date from period Y’). And it is true that if one seeks to ground assessments in quantitative data, then high-quality photography is a crucial tool, as in Stokes’s own research (e.g. Stokes 2012). As Bernhard Bischoff once prophesied, photography and other technologies would offer a means to move from subjective observations on appearances to objective measurements – a move from a “Kunst des Sehens und der Einfühlung” to a “Kunst des Messens” (quoted by Van Lit 2020: 102; see Bischoff 1990: 3, ‘an art of seeing and comprehending is in the process of becoming an art of measurement’). But alongside valuable questions which might well be settled objectively, of *When?*, *Where?* and *By whom?*, palaeography might in addition ask questions that remain matters of interpretation, even speculation, as the questions *How?* and *Why?* often are, and as even more strongly are such enquiries as *How did it strike a contemporary?*, or critical evaluations such as *How well done is it?* or *What are its merits and demerits?* (and *What are the criteria for such assessments?*). For some of these historical and critical questions, photography offers not only measurement but also evocation, narrative and argument. It is sometimes said that palaeography will only garner respect as a discipline when it becomes more objective; I would counter that it will also garner that respect when it also communicates the intellectual interest of these seemingly more subjective, or at least interpretative and even speculative, modes of assessment.

4.2 Breadth of Perspective

One means to address all kinds of questions, both objective and subjective, is by the breadth of vision which the assemblage of multiple images brings. Such breadth – which supplements one’s access to a library and allows the consultation of images from more than one repository in quick succession – is a crucial aid to visual memory and recognition for objective questions. For instance, it aids the identification of particular scribes whose work recurs in more than one manuscript. But the assembling of a corpus might also allow study of script beyond the biographical frame but in the *longue durée* or in other trajectories of argument or evaluation. A biography of a script, rather than a scribe, might depend on arguments about likenesses and differences of more subjective kinds across large corpora. In such questions, in all parts of manuscript studies, the corpus of photographs would not be objective proof but rhetorical tools, not evidence but exemplification in support of an interpretation. This was my experience of the photographic research process for an exhibition *Designing English: Graphics on the Medieval Page*. The exhibition and catalogue argued that ordinary book producers were skilled creative agents, even in the most seemingly ‘everyday’ aspects

of making manuscripts (Wakelin 2018). For the exhibition hall, artefacts were chosen to make that point; in the catalogue multiple illustrations were used. Almost all those pictures published were glossier, better quality versions of digital photographs I took myself. The exhibition's and catalogue's argument had developed through taking and then reviewing photographs of features in several hundred manuscripts. It was through such DIY photography that I strove to build up a sense of patterns and habits in page design, and to select and whittle down my selection of what would work well as exhibits or illustrations. The photography was not about objective proof – measurable properties; but about interpretation – what Bischoff called “seeing and comprehending” (‘des Sehens und der Einfühlung’). The breadth of examples, across seven centuries, would have made objective connections tenuous; the breadth instead allowed the comprehension of larger trends in creativity over time – for instance, the persistent battle with spacing, the persistent exploitation of hierarchies of colour and script, whatever the different and historically particular solutions to those puzzles century by century. The possibility of amassing images of diverse features in manuscripts, and of features not usually catalogued in and searchable from other researchers' metadata (problems with spacing, ruling patterns, skilful blends of text and diagram), made it possible to comprehend patterns of scribal behaviour across groups of books, and not only to make objective and verifiable claims about single books.

Yet the widening of perspective, as one compares manuscripts, can distort what one sees, by losing detail or local context. For instance, when for *Designing English* I gathered photographs of the same technique across dozens of manuscripts over centuries, I risked decontextualizing each example. A curated set of photographs treats as one coherent phenomenon or tradition something that early readers of manuscripts normally encountered singly, rarely, in just a handful of books. Selecting things to photograph and assembling those photographs creates a new object for analysis – the photographic archive – that differs from the original archived objects from which the images came. The researcher's perspective which gives the images meaning does, thereby, give them a meaning that the pages photographed did not have in their original context.

4.3 Depth of Perspective

Conversely, the photographer's perspective warps not only through breadth but through depth, as the person photographing for him- or herself is able to adjust the image composition to highlight a specific feature. Framing is central to art photography and to the dark arts of photojournalism, and the same possibilities and problems arise in photographing books. Most striking is the effect of the

close-up, which narrows the field of vision but renders its contents more striking by reproducing them on a larger scale. The effects of the close-up can also be strengthened by the camera's zoom, which has a long history behind it (White 2020). Yet even without the zoom function, the process of composing a close-up by framing and focusing on detail is a process of training the eye to look closely. Taking close-ups trains a habit of attention and a mode of focusing the lens literally and the mind intellectually, whether on exemplary instances or on consistency or divergence from one section to another. For instance, the handwriting of manuscripts is not uniform page by page, as a typeface is, but is subject to small alterations letter by letter as a scribe works; the ability to take multiple close-ups reveals the graphetic variation. Moreover, the enlargement of detail allowed by the close-up reveals things that might easily be seen but overlooked. To stay within palaeography, in the past analysis has often been of the finished letterforms on the page; but the penstrokes which produced them, and which would take us closer, phenomenologically, to the experience of the scribe writing – the movement of the pen or its flow or 'ductus' – have seemed invisible or difficult to illustrate, analyse and describe (Derolez 2003: 6–7). Now, with camera in hand, taking close-ups or zooming in makes it easier to see more clearly and in detail how strokes form letters. (It is more practicable for a scholar to photograph such features for herself than to direct a photographic studio in making such close-ups of details of script.) In this and other ways, taking DIY photographs can alter the depth at which we describe manuscripts.

There are still problems for such analysis though. It is not clear how accurately the naked eye, looking at photographs however close-up, can really observe colour, layers or depth. For this, the advanced kinds of image processing (like those pursued by Beeby, Gameson and Nicholson 2018) would be far preferable to DIY digitizations. Furthermore, there are theoretical questions about the close-up and zoom. How closely should you look at things? It is often said of high quality digitizations that they let us see things which were "meant to go unseen" (Endres 2019: 4, 34; see also Altschuler and Weimer 2020: 75). The depth allowed by even the simplest digital camera might be an anachronistic mode of seeing what was not meant to be seen.¹² For instance, the palaeographer who analyses a blown-up photograph can try to describe the strokes of the pen in detail and at a slowness that the scribe or the early readers might not have had time, facility or motive to. It is axiomatic in book history that not every element of a handmade book was there to be looked at (Tanselle 2009: 62), and that might be true of de-

¹² That is even truer of image processing, which is possible now on smartphones or simple free websites (such as <<http://retroreveal.org>> [accessed 31 May 2020]): see Endres (2019: 4, 23, 31).

tails which a photographer might frame and enlarge. Or in a world lit by candles and mostly without spectacles, did people perhaps peer more closely at the page? In a culture with a love of fine craftsmanship, did they inspect the handiwork of manuscripts more closely even than the most searching codicologist? We cannot know whether photographing books, which reveals some things, might blinker us, anachronistically, to other perspectives.

5 Uses of DIY Digitization

5.1 Using DIY Digitization: Textual Scholarship

The effects of the camera on revealing new things suggests how, as well as being driven by previous research questions, conversely digital photography can set agendas for research. Susan Sontag, as well as noting that pictures reflect our preconceptions, noted also that they “alter and enlarge our notions of what is worth looking at and what we have a right to observe” (2008: 3). She suggested that “[t]o photograph is to confer importance” on a subject (Sontag 2008: 28). Sometimes, what one selects for photography in a library will be guided by past and present scholarly trends; at other times, the process of photography might guide, in a way not necessarily envisaged before entering the library, what is later studied in the future – especially if one then leaves the library and works at a distance from the manuscripts themselves. It is not easy to pin down this circular process. But there is a chance that, in a practical way, photographing something will influence future research.

One possible influence from digital cameras, or indeed full digitizations, could be a renewed attention to the text – the alphanumeric symbols in the book. While transcribing a lengthy text from a manuscript might take too long on a short visit to a library far from home or might seem too risky without time to check the transcription, DIY photography makes it possible to do or check textual details later and to consider textual details in their material form in the manuscript, more so than a transcription does. A lot of work in editing now depends on such pictures (Pierazzo 2009: 169–170). Photography also facilitates other kinds of other close work on the text. From personal experience, photographs were valuable for comparing two manuscripts of Geoffrey Chaucer’s *Canterbury Tales* with exemplars from which they were copied (Wakelin 2014: 45–63, 271–273). First, they allowed me to make research trips to see the manuscripts, in Chicago and at the time Tokyo, shorter than would have been necessary to transcribe the texts as exactly as was required for that project. Second, working from photographs prevented the confounding of my data by errors in my transcription, which would

have disrupted the comparison of exemplar and copy that was my focus. Third, I could analyse textual transmission in manuscript context, not only as an abstract text in a typed transcription but as a practical task for the scribes, as one copyist decoded the particular visual characteristics of his exemplar. Indeed, the visual or spatial aspects of the exemplar often explained some feature of the copy. In ways like this, photography could allow a renewed focus on the text, and on textual editing, by lessening, if not removing, the practical costs and discomforts of studying manuscripts in situ, while increasing the possibility of analysing of language in its material context and as a material phenomenon in writing.

5.2 Using DIY Digitization: Materiality

But a renewed attention to textual scholarship would swerve slightly from some other recent work, which has instead steered towards the material form of the book; and in practice this textual focus has not been what photography has fostered. Rather, digital photography by readers, and curators too, has strengthened the historical and critical attention, prominent for three decades now, to the materiality of the book. DIY photography might feed such interests more than mass digitization. While the flattening effect of some institutional digitizations diminishes the viewer's sense of the three-dimensional and tactile properties of books, what have been called boutique digitizations – digitizations of fewer manuscripts but with more advanced methods tailored to those specific manuscripts, such as those led by Bill Endres – have counteracted that (Endres 2019); but so too have, as Johanna M.E. Green notes, digital pictures made by librarians with simple digital cameras. Such informal images are better at “communicating the manuscript's materiality in a more immediate manner” (2018), not least for their inclusion of oblique camera angles and the presence of curators' hands, which reveal the spatial and bodily contexts for books. Researchers' own DIY photographs share this advantage for comprehending materiality. Moreover, the process of taking photographs might lead the scholar to focus on things which reward the use of the camera: the book's visual and spatial properties, even the sense of its dimensions which the play of light brings. All these features and their effects are difficult to capture in words, even with a precise codicological vocabulary, and so the permission to take digital photographs makes them easier to record and remember. By contrast, the textual features of manuscripts were previously able to be transcribed, and even some two-dimensional features of the page could be recorded as measurements or diagrams (as were ruling patterns, for instance). But those seemingly two-dimensional patterns of text on blank surfaces do not lend themselves to the depth of field and play of light that the researcher's digital

photographs, from oblique angles in varied lighting conditions, can produce.¹³ Thus the use of the camera by researchers might make literal the theoretical ‘focus’ on the material properties of books, and lessen attention to the text – despite the fact that the camera could serve textual scholarship so well.

The use of images of all kinds can, though, lead to a “fetishism” for the materiality of things (Nelson and Terras 2012: 9). Moreover, the camera has focused attention on particular features of manuscripts: beautiful things or quirky things. This is one of the risks of photography as Sontag saw: its attraction to the photogenic, whether because beautiful or because freakish (Sontag 2008: 28–29, 52–53, 78). There is an obvious temptation to seek out what the camera – or the audience of its images – most loves. Many photographs which manuscript scholars share in the lively world of social media are the most lovely: painted illustrations, decorated marginal drawings, often of comic or cute sorts. By far the majority of pages of the majority of manuscripts consist of text, with minimal decoration beyond that which helps to articulate the words (such as chapter titles). But to judge from Twitter, blogs and some parts of Instagram, Tumblr and Flickr, one could be mistaken for thinking that most manuscripts include illustrations, multimedia devices such as volvelles, or slightly grisly and ugly features such as the animal’s fur not removed from ill-prepared parchment and pages sewn up like wounds – anything other than the plain rectangular page of text. (I say this guiltily, as I myself have shared both kinds of image on my own Twitter account or in publicity for the exhibition *Designing English*.) There have been worries by several historians of the book about the warping effect of social media’s photographs on perceptions of the past beyond academia (Werner 2014; Wiles 2015). And within academic research, the allure of the photogenic might draw attention away from the ordinary text page, drab to picture, to the extraordinary, tempting to photograph and so easy to remember and analyse in later research far from the library, with only selective images as aide-memoire. Thus digital images which could facilitate attention to the text might discourage it. This could reflect a problem of words in pictures: it is often said that it is hard to read printed text at length on screen (Baron 2015), so how much harder is the reading of outdated languages and scripts in roughly made photographs of manuscripts? Instead, DIY photography leads scholars to look at things more readily taken in at a glance.

¹³ Of course, no surface is really two-dimensional, as Endres (2019: e.g. 33) explores; but to the naked eye or simple lens, some features seem more strikingly three-dimensional than others.

6 Conclusions

The ability to photograph might also lead to an expectation of photography in publications and presentations, as a way to prove points and to prove one's first-hand access to it: as Sontag observed, "[s]omething we hear about, but doubt, seems proven when we're shown a photograph of it" (2008: 5). This veridical quality is one of the benefits of DIY photography, as one can show colleagues unable to see the manuscript itself what is found there; it empowers more people to make critical assessments of scholarly arguments. But the proliferation of photographic images in academic communication has practical problems: a slide show for a conference can employ dozens of photographs, but such would be too expensive and take too much space for a publication in print (besides the legal debates outlined by Green 2021, this volume); and this expectation of images could exacerbate how DIY digitization reflects inequalities of access to manuscript sources. Then the use of photographic evidence raises intellectual questions too. Consumers of photographs in the news media are wisely suspicious of the truth-claims they seem to offer: the choice of images and their perspectives, framing and level of detail can falsify as well as verify. And the reliance on illustrations risks descriptiveness, as though the scholar has nothing to add with her own words. Scholarship involves argument too, not just show-and-tell. As Sontag put it, "[t]he truths that can be rendered in a dissociated moment" – a still image out of context – "have a very narrow relation to the needs of understanding" (2008: 112). To show a photograph of something in one or more stills of manuscripts does not explain change over time or link examples to their social functions and meanings. The objective evidence photographed cannot crowd out the subjective process of interpreting and evaluating. Imaging cannot replace analysis.

Nor will it: for (as noted) the photography done by readers in libraries is already a mode of analysis. Each shot is prompted by a prior sense of the questions which need evidence; each image comes from the perspective of the researcher, which is both its limit and its benefit; and the photographic process, of selecting and framing, focuses and refocuses the researcher's attention in various ways. As such, DIY photography is not like the microfilms formerly that continue to provide essential access to manuscripts. It will never supplant the well-conceptualized and well-made digitizations, which offer greater access and, with more advanced and experimental imaging processes, greater potential for research. But until such digitization is literally all-encompassing, DIY digitization will have a place. And, in turn, institutional digitization could never fully supplant DIY digital photography. Such photography is necessary not only as access to sources but as a practice of analysis. It creates new ways of seeing, selecting, organizing and

thinking comparable to, but different from, other scholarly media such as notes, transcriptions or databases. As intellectual historians show, scholars' methods shape what scholars know. In this respect, studying a manuscript with a digital camera is *not* similar to using a large-scale digitization online but is more similar to taking notes by pencil or laptop. Just like the note-taker, the photographer must select what to include or exclude, quote or summarize, zoom into or zoom out from. The selection and the balance between closeness or depth, distance or surface, are two of the greatest intellectual challenges in any research and writing in the humanities. What might be called 'DIY digitization' is, perhaps, then, better thought of not as digitization but as digitally enabled scholarship, with the smartphone, tablet or camera not an extension of the corpora of manuscripts but an extension of the mind, a digital prosthesis for thinking. To paraphrase Traube, photography sharpens the scholar's own eye.

Works Cited

- Albritton, Benjamin, Georgia Henley and Elaine Treharne (eds.). 2020. *Medieval Manuscripts in the Digital Age*. London: Routledge.
- Altschuler, Sari and David Weimer. 2020. "Texturing the Digital Humanities: A Manifesto". *PMLA* 135: 74–91.
- Anon. 2015. "Photography in the Manuscripts Reading Room". On the blog *British Library: Medieval Manuscripts*. 19 March. <<https://britishlibrary.typepad.co.uk/digitisedmanuscripts/2015/03/photography-in-the-manuscripts-reading-room.htm>> [accessed 31 May 2020].
- Baron, Naomi. 2015. *Words Onscreen: The Fate of Reading in a Digital World*. Oxford: Oxford University Press.
- Beeby, Andrew, Richard Gameson and Catherine Nicholson. 2018. "New Light on Old Illuminations". *Archives and Records* 39: 244–256.
- Bischoff, Bernhard. 1990. *Latin Palaeography: Antiquity and the Middle Ages*. Trans. Dáibhí Ó Cróinín and David Ganz. Cambridge: Cambridge University Press.
- Booth, Alison and Miriam Posner. 2020. "Introduction: The Materials at Hand". *PMLA* 135: 9–22.
- Boyle, Leonard. 1984. *Medieval Latin Palaeography: A Bibliographical Introduction*. Toronto: University of Toronto Press.
- Braun, Marta and Hope Kingsley (eds.). 2015. *Salt and Silver: Early Photography 1840–1860*. London: Mack.
- Clark, Meredith D. 2020. "Picture this: The Screenshot's Use in Digital Humanities Scholarship". *PMLA* 135: 203–206.
- Derolez, Albert. 2003. *The Palaeography of Gothic Manuscript Books*. Cambridge: Cambridge University Press.
- Echard, Siân. 2008. *Printing the Middle Ages*. Philadelphia, PA: University of Pennsylvania Press.
- Edwards, A. S. G. 2013. "Back to the Real?". *Times Literary Supplement* 7 June: 15.
- Endres, Bill. 2017. "A Literacy of Building: Making in the Digital Humanities". In: Jentery Sayer (ed.). *Making Things and Drawing Boundaries: Experiments in the Digital Humanities*. Minneapolis, MN: University of Minnesota Press. 44–54.

- Endres, Bill. 2019. *Digitizing Medieval Manuscripts: The St. Chad Gospels, Materiality, Recoveries, and Representation in 2D and 3D*. Leeds: Arc Humanities Press.
- Gómez Cruz, Edgar and Eric T. Meyer. 2012. "Creation and Control in the Photographic Process: iPhones and the Emerging Fifth Moment of Photography". *Photographies* 5: 203–221.
- Green, Daryl. 2021. "Learning to Let Go: Ownership, Rights, Fees, and Permissions of Readers' Photographs". In: Ursula Lenker and Gabriele Rippl (eds.). *Book Histories in the Digital Age*. Special Issue of *Anglia* 139: 59–70.
- Green, Johanna M. E. 2018. "Digital Manuscripts as Sites of Touch: Using Social Media for 'Hands-On' Engagement with Medieval Manuscript Materiality". In: Michael Hanrahan and Bridget Whearty (eds.). *Digital Medieval Manuscript Cultures*. Special Issue of *Archive Journal*. September 2018. <<http://www.archivejournal.net/essays/digital-manuscripts-as-sites-of-touch-using-social-media-for-hands-on-engagement-with-medieval-manuscript-materiality/>> [accessed 31 May 2020].
- Hamlyn, Sarah. 2015. "What you should Know about Self-Service Photography". On the blog *British Library: Collection Care*. 19 January. <<https://blogs.bl.uk/collectioncare/2015/01/what-you-should-know-about-self-service-photography.html>> [accessed 31 May 2020].
- Hanrahan, Michael and Bridget Whearty. 2018. "Introduction". In: Michael Hanrahan and Bridget Whearty (eds.). *Digital Medieval Manuscript Cultures*. Special issue of *Archive Journal*. September 2018. <<http://www.archivejournal.net/essays/digital-medieval-manuscript-cultures/>> [accessed 31 May 2020].
- Hassner, Tal et al. (eds.). 2013. "Report from Dagstuhl Perspectives Workshop 12382: Computation and Palaeography: Potentials and Limits". <10.4230/DagRep.2.9.184> [accessed 31 May 2020].
- Jones, Melissa L. 2010. "DIY Digitization: Creating a Small-Scale Digital Zine Exhibit". In: Kwong Bor Ng and Jason Kucsma (eds.). *Digitization in the Real World: Lessons Learned from Small and Medium-Sized Digitization Projects*. New York: Metropolitan New York Library Council. 1–22.
- Madsen, Christine McCarthy. 2010. "Communities, Innovation, and Critical Mass: Understanding the Impact of Digitization on Scholarship in the Humanities through the Case of Tibetan and Himalayan Studies". Unpubl. DPhil. thesis, University of Oxford. <<https://ora.ox.ac.uk/objects/uuid:928053ea-e8d9-44ff-9c9a-aaae1f6dc695>> [accessed 31 May 2020].
- Maniaci, Marilena et al. 2011. "Applications actuelles de l'informatique à la paléographie: Quelles méthodes pour quelles finalités?". *Gazette du livre médiéval* 56–57: 119–130.
- Menna, Giulio. 2012. "Manuscript Photogeny – When Manuscripts Smile to the Camera". On the blog *Medieval Fragments*. 13 July. <<https://medievalfragments.wordpress.com/2012/07/13/manuscript-photogeny-when-manuscripts-smile-to-the-camera/>> [accessed 31 May 2020].
- Meyer, Eric T. 2007. "Socio-Technical Perspectives on Digital Photography: Scientific Digital Photography Use by Marine Mammal Researchers". Unpubl. PhD dissertation, Indiana University. <<https://scholarworks.iu.edu/dspace/bitstream/2022/7732/1/umi-indiana-1879.pdf>> [accessed 31 May 2020].
- Moschovi, Alexandra, Carol McKay and Arabella Plouviez. 2013. "Introduction". In: Alexandra Moschovi, Carol McKay and Arabella Plouviez (eds.). *The Versatile Image: Photography, Digital Technologies and the Internet*. Leuven: Leuven University Press. 1–32.
- Muellner, Nicholas. 2013. "The New Interval". In: Alexandra Moschovi, Carol McKay and Arabella Plouviez (eds.). *The Versatile Image: Photography, Digital Technologies and the Internet*. Leuven: Leuven University Press. 75–82.

- Münster, Sander and Melissa Terras. 2019. "The Visual Side of Digital Humanities: A Survey on Topics, Researchers, and Epistemic Cultures". *Digital Scholarship in the Humanities* 35: 366–389. <<https://doi.org/10.1093/llc/fqz022>> [accessed 31 May 2020].
- Nelson, Brent and Melissa Terras. 2012. "Introduction". In: Brent Nelson and Melissa Terras (eds.). *Digitizing Medieval and Early Modern Material Culture*. Tempe, AZ: Arizona Center for Medieval and Renaissance Studies. 1–20.
- Pierazzo, Elena. 2009. "Digital Genetic Editions: The Encoding of Time in Manuscript Transcription". In: Marilyn Deegan and Kathryn Sutherland (eds.). *Text Editing: Print and the Digital World*. Farnham: Ashgate. 169–186.
- Prescott, Andrew and Lorna Hughes. 2018. "Why do we Digitize? The Case for Slow Digitization". In: Michael Hanrahan and Bridget Whearty (eds.). *Digital Medieval Manuscript Cultures*. Special issue of *Archive Journal*. September 2018. <<http://www.archive-journal.net/essays/why-do-we-digitize-the-case-for-slow-digitization/>> [accessed 31 May 2020].
- Rubinstein, Daniel. 2020. "The New Paradigm". In: Daniel Rubinstein (ed.). *Fragmentation of the Photographic Image in the Digital Age*. New York: Routledge. 1–7.
- Schaaf, Larry J. 2017. "Sleuthing in a Library's Davenport". On the blog *The Talbot Catalogue Raisonné*. 10 November. <<https://talbot.bodleian.ox.ac.uk/2017/11/10/sleuthing-in-a-librarys-davenport/>> [accessed 31 May 2020].
- Schaaf, Larry J. et al. (eds.). 2017. *The Talbot Catalogue Raisonné*. <<http://foxtalbot.bodleian.ox.ac.uk/search>> [accessed 31 May 2020].
- Sontag, Susan. 2008. *On Photography*. London: Penguin.
- Spencer, H. Leith. 2015. "F. J. Furnivall's Six of the Best: The Six-Text *Canterbury Tales* and the Chaucer Society". *Review of English Studies* 66: 601–623.
- Stanford, Emma. 2016. "DIY Digitization Mini-Conference". On the blog *Bodleian Digital Libraries*. 18 January. <<https://blogs.bodleian.ox.ac.uk/digital/tag/diy-digitization/>> [accessed 31 May 2020].
- Stokes, Peter A. 2009. "Computer-Aided Palaeography, Present and Future". In: Malte Rehbein, Patrick Sahle and Torsten Schaßan (eds.). *Kodikologie und Paläographie im digitalen Zeitalter – Codicology and Palaeography in the Digital Age*. Norderstedt: Books on Demand. 309–338.
- Stokes, Peter A. 2011. "Teaching Manuscripts in the Digital Age". In: Franz Fischer, Christiane Fritze and Georg Vogeler (eds.). *Kodikologie und Paläographie im digitalen Zeitalter 2 – Codicology and Palaeography in the Digital Age 2*. Norderstedt: Books on Demand. 229–245.
- Stokes, Peter. A. 2012. "Palaeography and the 'Virtual Library' of Manuscripts". In: Brent Nelson and Melissa Terras (eds.). *Digitizing Medieval and Early Modern Material Culture*. Tempe, AZ: Arizona Center for Medieval and Renaissance Studies. 137–169.
- Tanselle, G. Thomas. 2009. *Bibliographical Analysis: A Historical Introduction*. Cambridge: Cambridge University Press.
- Terras, Melissa. 2010. "Digital Curiosities: Resource Creation via Amateur Digitization". *Literary and Linguistic Computing* 25: 425–438.
- Terras, Melissa. 2015a. "Cultural Heritage Information: Artefacts and Digitization Technologies". In: Ian Ruthven and G. G. Chowdhury (eds.). *Cultural Heritage Information: Access Management*. London: Facet. 63–88.
- Terras, Melissa. 2015b. "Opening Access to Collections: The Making and Using of Open Digitised Cultural Content". *Online Information Review* 39: 733–752.

- Terras, Melissa. 2016. "Crowdsourcing in the Digital Humanities". In: Susan Schreibman, Ray Siemens and John Unsworth (eds.). *A New Companion to Digital Humanities*. Oxford: Wiley. 420–439.
- Traube, Ludwig. 1909. *Zur Paläographie und Handschriftenkunde*. Ed. Paul Lehmann. Munich: Beck.
- Van Haaren, Suzette. 2020. "Physical Distancing from Manuscripts and the Presence of the Digital Facsimile". On the blog *Cambridge Medieval Graduate Students*. 25 May. <<https://camedievalists.wordpress.com/2020/05/25/physical-distancing-from-manuscripts-and-the-presence-of-the-digital-facsimile/>> [accessed 31 May 2020]
- Van Lit, L.W.C. 2020. *Among Digitized Manuscripts: Philology, Codicology, Palaeography in a Digital World*. Leiden: Brill.
- Wakelin, Daniel. 2014. *Scribal Correction and Literary Craft: English Manuscripts, 1375–1510*. Cambridge: Cambridge University Press.
- Wakelin, Daniel. 2018. *Designing English: Early Literature on the Page*. Oxford: Bodleian Library.
- Werner, Sarah. 2014. "It's History, Not a Viral Feed". On her blog *Wynken de Worde*. 26 January. <<http://sarahwerner.net/blog/2014/01/its-history-not-a-viral-feed/>> [accessed 31 May 2020].
- White, Tom. 2020. "A Working History of Digital Zoom, Medieval to Modern". Talk at the Medieval English Research Seminar, University of Oxford, 27 May 2020 [conducted by Microsoft TEAMS]. (Quoted with permission.)
- Wiles, Kate. 2015. "Monetising the Past: Medieval Marginalia and Social Media". On the blog *History Today*. 10 April. <<https://www.historytoday.com/kate-wiles/monetising-past-medieval-marginalia-and-social-media>> [accessed 8 December 2019].