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Oral History and the (Digital) Humanities

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Abstract

How can oral history enrich historical study of the humanities? Focusing on digital humanities research as developed since the 1950s in Italy and Germany, this chapter explores the promises and pitfalls of oral history as a tool for writing histories of the humanities. In particular, it shows the difference that oral history can make in a field dominated by machine-centric accounts of its history. Among other things, oral history can foreground rarely-heard or lesser-known voices from actors who are excluded from canonical history (e.g., female keypunch operators), look around, under, over or behind landmarks of technical progress, and problematize received histories of the field. The chapter develops this argument by discussing the cases of the work of Italian Jesuit scholar Roberto Busa and the German humanities computing expert Wilhelm Ott.

Keywords: digital humanities, oral history, Roberto Busa, Wilhelm Ott

Introduction

The inaugural¹ issue of the journal *History of Humanities* observes: “It is probably impossible to give a definition of the term *humanities* that would cover a category of practices, or objects of study, that remains fixed throughout all periods of intellectual activity across the world.”² It is likewise with the definition of *digital humanities*, which, according to Ramsey: “can mean anything from media studies to electronic art, from data mining to edutech, from scholarly editing to anarchic blogging, while inviting code junkies, digital artists, standards wonks, transhumanists, game theorists, free culture advocates, archivists, librarians, and edupunks under its capacious canvas.”³ Neither the geographies, taxonomies nor circumferences of the humanities or digital humanities are fixed, yet substantial commonalities crosscut their diversity, for example, the centrality of modelling as a research strategy,⁴ and the centrality of artefacts of cultural heritage as the unit of analysis for both.⁵

Following from this, the jumping-off point of this contribution is that bridging points between the history of the humanities and the history of digital humanities must similarly exist, and that their mapping can enrich understandings of their shared geographies, taxonomies and circumferences. In the context of the history of digital humanities, recent work has demonstrated that when used with care, oral history can advance rich and pluralised readings of the field, readings that are commensurate with its variegated scope of operation.⁶ Examples of this are attested in two books that we have recently worked on. *One Origin of Digital Humanities: Fr Roberto Busa S.J. in His Own Words* (2019) interfolds oral history with archival research to select and contextualise previously out of print or inaccessible writings of

¹ Thank you to Herman J. Paul and Geoffrey Rockwell for their helpful comments on this chapter.

² Rens Bod et al., “A New Field: History of Humanities,” *History of Humanities* 1, no. 1 (2016), 2.

³ Stephen Ramsay, “Who’s in and Who’s Out,” in *Defining Digital Humanities: A Reader*, ed. Melissa Terras, Julianne Nyhan, and Edward Vanhoutte (Surrey: Ashgate, 2013), 239.

⁴ E.g., Willard McCarty, *Humanities Computing* (Basingstoke: Palgrave Macmillan, 2005); Rens Bod, “Modelling in the Humanities: Linking Patterns to Principles,” *Historical Social Research*, Supplement 31 (2018), 78-95.

⁵ E.g., Rens Bod, *A New History of the Humanities: The Search for Principles and Patterns from Antiquity to the Present*, trans. Lynn Richards (Oxford: Oxford University Press, 2013); Samantha Lutz, “{D1G1TAL HER1TAGE}: From Cultural to Digital Heritage,” *Hamburger Journal für Kulturanthropologie* 7 (2018), 3-23.

⁶ Julianne Nyhan and Andrew Flinn, *Computation and the Humanities: Towards an Oral History of Digital Humanities* (Cham : Springer, 2016), 21-36.

Busa, and translate them into English.⁷ For instance, an oral history interview with Busa's translator, Philip Barras, captures recollections about Busa not previously on record, and foregrounds how Barras' memories of Busa informed how he translated the articles contained in the volume. These kinds of reflections are not regularly captured in scholarship of this kind.

The second book, *Hidden and Devalued Labour in the Digital Humanities: On the Index Thomisticus Project 1954-67*, again interfolds oral history and extensive archival research to uncover the overlooked labour that underpinned Busa's *Index Thomisticus* project.⁸ It not only describes how female keypunch operators worked with electromechanical punched card machines, but also identifies the factors that served to devalue and ultimately silence these female operators. In doing so, the book draws attention to obscured historical dynamics and processes encoded in the "deep time" of the digital tools, data, and algorithms that digital humanities makes and uses.

Drawing and expanding on these two books, this chapter further explores the contributions that oral history can make to historicizing the digital humanities. After a brief survey of recent scholarship on the history of humanities computing, we highlight some of the promises and pitfalls of oral history. We discuss Stéfan Sinclair and Geoffrey Rockwell's work on forgotten text analysis technologies. Finally, drawing on an oral history interview with the German humanities computing expert Wilhelm Ott, we show how this line of research might be expanded.

The history of digital humanities

The source of the branching course now known as digital humanities has been traced to a number of springs, the most high-profile being that of Busa's work on the *Index Thomisticus*, beginning around 1949.⁹ The years following the field's emergence are not notable for having produced many works that sought to historicize its emergence and development.¹⁰ Since

⁷ *One Origin of Digital Humanities: Fr Roberto Busa in His Own Words*, ed. Julianne Nyhan and Marco Passarotti (Cham: Springer, 2019).

⁸ Julianne Nyhan, *Hidden and Devalued Labour in the Digital Humanities: On the Index Thomisticus Project 1954-67* (London: Routledge, 2022).

⁹ Julianne Nyhan and Marco Passarotti, "Introduction, or Why Busa Still Matters," in Nyhan and Passarotti, *One Origin of Digital Humanities*, 1-18.

¹⁰ Publications tended to be article-length surveys of the history of the application of computing to particular fields of the humanities, like classics and musicology. See, e.g., Walter B. Hewlett and Eleanor Selfridge-Field, "Computing in Musicology, 1966-91,"

about 2000, however, a more sustained interest in the history of digital humanities can be noticed, along with a decidedly more pluralised panoply of readings, and ways of reading, its histories.

One of the most influential histories of humanities computing sought to “highlighting landmarks where significant intellectual progress has been made or where work done within humanities computing has been adopted, developed or drawn on substantially within other disciplines.”¹¹ More recent work has tended to look around, under, over and behind landmarks of progress, and problematize received, andro- and machine-centric histories of the field, to better account for the contributions of those actors and agents who were subsumed by the canonical history.¹² Alternative histories for the field have been proposed and the search for historical precedents and inflections has expanded to spaces and communities beyond the Anglo-American. Some historiographical reflections on the context of, and potential for, histories of digital humanities have also appeared.¹³

A rich pallet of methodological approaches, and theoretical framings have contributed to the gradations and nuance of recent historicizations. The work of Rockwell, Sinclair and Jones, in particular, has utilised media archaeology and humanistic fabrication to recover forgotten technologies that “help us understand opportunities and challenges as they were

Computers and the Humanities 25, no. 6 (1991), 381-392; T. F. Brunner, “Classics and the Computer: The History of a Relationship,” in *Accessing Antiquity: The Computerization of Classical Studies*, ed. J. Solomon (Tucson, AZ: University of Arizona Press, 1993), 10-33; histories of the development indexes and concordances, humanities computing’s canonical tools (in a series of articles by Burton e.g., Dolores M. Burton, ‘Automated Concordances and Word Indexes: The Fifties,’ *Computers and the Humanities* 15, no. 1 (1981), 1-14; and articles on acclaimed scholars like Busa e.g., Thomas Nelson Winter, “Roberto Busa S.J. and the Invention of the Machine-Generated Concordance,” *The Classical Bulletin* 75, no. 1 (1999), 3-20.

¹¹ Susan M. Hockey, “The History of Humanities Computing,” in *A Companion to Digital Humanities*, ed. Susan Schreibman, Ray Siemens, and John Unsworth (Malden, MA: Blackwell, 2004), 3.

¹² e.g. Amy Earhart et al., “Alternate Histories of the Digital Humanities: A Short Paper Panel Proposal” (2017), online at <https://dh2017.adho.org/abstracts/115/115.pdf> (accessed 22 April 2021); Tom Scheinfeldt, “The Dividends of Difference: Recognizing Digital Humanities Diverse Family Tree’s” (7 April 2014), online at <http://foundhistory.org/2014/04/the-dividends-of-difference-recognizing-digital-humanities-diverse-family-trees/> (accessed 22 April 2021).

¹³ Willard McCarty, “Getting There from Here: Remembering the Future of Digital Humanities Roberto Busa Award Lecture 2013,” *Literary and Linguistic Computing* 29, no. 3 (2014), 283-306.

perceived at the time and on their own terms rather than imposing our prejudices.”¹⁴ Parikka indeed characterises media archaeology as a “way to investigate new media cultures through insights from past new media, often with emphasis on the forgotten, the quirky, the non-obvious apparatuses, practices, and inventions.”¹⁵ Sinclair and Rockwell’s humanistic modelling of now lost infrastructures and their interactive digital simulation of keypunching,¹⁶ and Jones and colleagues 3D reconstruction of Busa’s first laboratory in Gallarate,¹⁷ pose fundamental questions about epistemologies of historical knowledge production, and raise new possibilities for encountering interpretations of that which once was in the digital humanities.

Oral history for digital humanities

The research that we have been undertaking has centred oral history, and sought to situate the emergence and development of digital humanities in wider socio-cultural and political contexts, so as to better account for how human agency shaped the field. This has often been eclipsed by the machine-centric readings, and techno-utopian viewpoint that is a prominent feature of the field’s scholarly literature. As with humanistic fabrication, which, as mentioned above, offers the possibility of elaborating and encountering interpretative models of historical artefacts, the oral history interview can also be understood as an interpretative model, in the sense that it does not necessarily claim to represent an “objective” or “authoritative” rendering of the encounters that it recalls. Rather, an oral history interview is self-consciously a refraction of past events through time, narrative, language and memory,

¹⁴ Stéfan Sinclair and Geoffrey Rockwell, “Towards an Archaeology of Text Analysis Tools,” Presented at Digital Humanities 2014, Lausanne, Switzerland (2014), 357-8.

¹⁵ Jussi Parikka, *What Is Media Archaeology?* (Cambridge: Polity Press, 2012), 2.

¹⁶ Stéfan Sinclair, ‘Experiments with Punch Cards.’ *Stefan Sinclair* (blog). 2016. <http://stefansinclair.name/punchcard/> (accessed 02/01/21); Rockwell, Geoffrey, and Stéfan Sinclair. 2020. ‘Tremendous Mechanical Labor: Father Busa’s Algorithm,’ *Digital Humanities Quarterly* 014 (3).

¹⁷ Steven Jones et al., ‘RECALL: Reconstructing the First Humanities Computing Centre.’ 2017. <http://www.recaal.org/pages/walkthrough.html> (accessed 7/2/21); Steven Jones, ‘Reverse Engineering the First Humanities Computing Center,’ *Digital Humanities Quarterly* (2018) 012 (2).

further mediated by factors like the identity and interrelationship of interviewer and interviewee, and their convergence in the physical and exploratory space of the interview.¹⁸

The oral history work that we have done on the history of digital humanities has especially been taken under the rubric of the “Hidden Histories: Computing and the Humanities, c. 1949–1980” project. This work has demonstrated that when used with care oral history can contribute to a grounded history that exposes overarching processes while acknowledging through personal narratives the agency and creativity of a plurality of individuals, and not just the great men and women of scientific advancement. The book *Computation and the Humanities: Towards an Oral History of Digital Humanities* presents the first oral history account of the history and development of digital humanities.¹⁹ Thirteen oral history interviews and four analytical chapters incrementally unpick shifting, complex, and heterogeneous aspects of the emergence and development of digital humanities and the experiences of those who helped develop it. In the next section, we will turn, then, to a more detailed exploration of some of the advantages that oral history offers when doing this kind of work.

Why oral history?

Oral history can open new opportunities to foreground rarely-heard or lesser-known voices, to “give back to the people who made and experienced history, through their own words, a central place.”²⁰ Archives are not neutral spaces; the subjectivities of data collection and preservation that they enfold can work in the interests of some and against the interests of others.²¹ Minoritized communities, like women, have “comparative lack of archival trace to secure them in the sightlines of history”²² and it is often difficult to find them in the (analogue)

¹⁸ Alessandro, Portelli, *Battle of Valle Giulia: Oral History and the Art of Dialogue* (Madison, WI: University of Wisconsin Press, 1997), viii.

¹⁹ Nyhan and Flinn, *Computation and the Humanities*.

²⁰ Paul Thompson, *The Voice of the Past: Oral History*, 3rd ed. (Oxford: Oxford University Press, 2000), 3.

²¹ E.g., Terry Cook, “The Archive(s) Is a Foreign Country: Historians, Archivists, and the Changing Archival Landscape,” *The American Archivist* 74, no. 2 (2011), 600-632.

²² Antoinette M. Burton, “Finding Women in the Archive: Introduction,” *Journal of Women’s History* 20, no. 1 (2008), 149.

archive “predominantly produced and preserved by men.”²³ The oral history interview, then, can seek to redress this, “to reconstruct the world” lost to, or excluded from documents, archives, and, as this article, suggests, technologies.²⁴ Oral history has been intertwined, for example, in work that has uncovered the previously unacknowledged role of gender in the history of computing.²⁵

Though multiple individual testimonies may be enfolded into an overarching historical narrative, rich patterns of understanding can arise from the analysis of multiple narratives, as much as the individual narrative: “In contrast to simplified storylines of individuals reduced to a single identity or experience . . . the flexible and expansive form of the interview allows a narrator, in their own words with their own frameworks, to contextualise their experiences within a broader socio-political and historical milieu, and in the process more fully represent the many dimensions of their identity.”²⁶ In this way, oral history can allow different lenses, with different resolutions of personal or community experience, for example, or motivation, to be foregrounded. Oral history, then, contributes “to the creation of imaginative frameworks through which the past is felt, as well as thought about.”²⁷

Challenges of oral history

Early criticisms of oral history revolved around the credibility of retrospective personal testimonies, inconsistencies of memory, choice of interviewees, and bias when compared with the contemporaneous record. Equally, the possibility that such a democratising methodology would undermine the very principles of scholarly rigour troubled historians.²⁸ As has already been demonstrated, however, what was once considered limiting is now considered the strength of (a no less rigorous) oral history methodology: subjectivity and the

²³ Catherine Bishop, “The Serendipity of Connectivity: Piecing Together Women’s Lives in the Digital Archive,” *Women’s History Review* 26, no. 5 (2017), 767.

²⁴ Valerie J. Korinek, “Locating Lesbians, Finding ‘Gay Women,’ Writing Queer Histories,” in *Beyond Women’s Words: Feminisms and the Practices of Oral History in the Twenty-First Century*, ed. Katrina Srigley, Stacey Zembrzycki, and Franca Iacovetta (London: Routledge, 2018), 128.

²⁵ E.g., Janet Abbate, *Recoding Gender: Women’s Changing Participation in Computing* (Cambridge, MA: MIT Press, 2012).

²⁶ Sarah K. Loose and Amy Starecheski, “Oral History for Building Social Movements, Then and Now,” in Srigley, Zembrzycki, and Iacovetta, *Beyond Women’s Words*, 238.

²⁷ Ludmilla J. Jordanova, *History in Practice* (London: Arnold, 2000), 1.

²⁸ Robert Perks and Alistair Thomson, *The Oral History Reader* (Abingdon: Routledge 2016), 3-6

way in which people remember the past and contextualise their relationship with it, however flawed, is itself a vista of more sociologically meaningful questions than might otherwise be possible through traditional textual sources alone, and when enfolded with archival research.

Nonetheless, there remain considerations of representativeness and particularly for oral histories that are “community” focused, for instance with a community of practice like the digital humanities, there is a need to be broad and inclusive in the choice of interviewees, and with voices both positive and critical. Oral History, after all, should critically embrace difference and dissonance in recollection and interpretation.²⁹ In this vein, we must attend to the memories and perspectives of oral testimonies not as self-contained points of interest but as interconnected by shared narratives, society, culture, ideology.

Further, more practical challenges of this approach are the intersubjective dynamics between interviewer and interviewee, as well as the level of experience and expertise of the interviewer, all of which shape the quality and trajectory of the dialogue. Likewise, whilst not falling into the trap of too simplistic binary distinctions, the “insider” or “outsider” perspective of the interviewer and the kind of relationship this generates can have both advantages and disadvantages.³⁰ Insider knowledge and familiarity may at once be crucial to accessing certain interviewees and knowing the right questions to ask, but equally it may foreclose the asking of more difficult questions of one’s peers or more critical readings of their answers. On the other hand, while an outsider may struggle to acclimate to a particular group/community – and this may be a linguistic, gender, generational, or cultural as well as epistemic challenge – interviewees may indeed speak more freely with a “trusted outsider.”³¹

Lastly, loss of such interpersonal context is risked in the archiving and afterlife of recordings, perhaps most glaringly so when a transcript supersedes or outlives the original recording as the authoritative record. These interstices should be mitigated for at the point of creation and documentation of new oral histories, as well as accounted for in using oral testimonies as historical sources. Interlinked with this and extending the parameters of informed consent is the need for an ethics of care with due regard to archiving, copyright, re-

²⁹ Linda Shopes, "Oral History and the Study of Communities: Problems, Paradoxes, and Possibilities," *The Journal of American History* 89, 2 (2002) 588-98.

³⁰ Lynn Abrams, *Oral History Theory*, (Abingdon: Routledge 2016) 58-63

³¹ See Nyhan and Flinn, *Computation and the Humanities*, 32 and for an extended discussion of challenges to oral history see 21-34.

use, re-analysis, digitisation, access and publishing of oral history recordings or data.³² Ultimately a critically and feminist informed approach to oral history must be one that embraces intersubjectivity and the sharing of authority at the heart of its practice.³³ As such, the authors have elsewhere advocated for more radically centring “shared authority” between interviewers and interviewees in such oral history projects as those discussed in this contribution, and to which we now turn.³⁴

Case study: Robert Busa

In the research that we have conducted, oral history has particularly supported ways of going beyond standard written texts, and of encountering and reflecting on different types of evidence and “imaginative frameworks”. In their media-archaeology informed presentation at the Digital Humanities conference 2014, Sinclair and Rockwell explored three forgotten text analysis technologies from before the advent of the world wide web, “when humanists and artists were imagining what could be done” in very different text analysis environments to the ones we routinely encounter now. Their three examples were Busa’s use of punched cards for data entry; the command language that was designed by John B. Smith for the early text analysis tool ARRAS; and Robert J. Glickman’s PRORA text analysis tool, including his observations about how:

concordances could be printed as cards for 2-ring binders so that they could be taken out and arranged on a table by users. He was combining binder technology with computing to reimagine the concordance text. Today we no longer think about output to paper as important to tools, and yet that is what the early tools were designed to do as they were not interactive. We will use this case study to recover what at the time was

³² Anna Sheftel & Stacey Zembrzycki “Slowing Down to Listen in the Digital Age: How New Technology Is Changing Oral History Practice,” *The Oral History Review* 44,1, (2017), 94-112

³³ Katrina Srigley, Stacey Zembrzycki, and Franca Iacovetta, “Introduction” in *Beyond Women’s Words* (2018), 10.

³⁴ Smyth, Nyhan & Flinn, “Opening the ‘Black Box’ of Digital Cultural Heritage Processes. Feminist digital humanities and critical heritage studies” in Schuster & Dunn (eds) *Routledge International Handbook of Research Methods in Digital Humanities* (Abingdon: Routledge, 2020).

one of the most important features of a concordancing tool – how it could output something that could be published for others to use.³⁵

In their case studies of pre-internet text analysis technologies, Sinclair and Rockwell give a further example of when, in 1957, Paul Tasman of IBM, Busa's close collaborator, wrote a rather limpid description of the methodology that was devised for the *Index Thomisticus* project. Tasman's account of the methodology is paraphrased below:

- The scholar analyses and pre-edits the text (e.g., text by Thomas Aquinas) and marks the phrase;
- Two keypunch operators input the phrases (twice onto the same card) ;
- The checking machine verifies the accuracy of the input;
- From the phrase card the machine outputs cards which each contain one of the words contained in that phrase along with essential information to allow it to be identified in the text ("word cards"). It also produces a copy of each of the phrase cards;
- The machine checks the "word cards" and produces "form cards," e.g. by eliminating duplicates and calculating word frequency;
- The scholar must intervene again now to produce "entry cards" from "form cards." They perform the linguistic operations that the machine cannot i.e. they distinguish between homophones and group inflected word forms under their corresponding lemma;
- Now the machine is called for again to "interpret" the four groups of cards that have been generated during this process. Tasman describes the process of interpretation as "the machine will print on the top of each card in letters and consecutive numbers whatever information the card contains 'written' in holes."³⁶
- The information about the text that is contained on these four sets of cards (i.e. the phrase and word cards, which contain two transcriptions of the text and the form

³⁵Sinclair and Rockwell, "Towards an Archaeology of Text Analysis Tools." 357.

³⁶ Paul Tasman, "Literary Data Processing," *IBM Journal of Research and Development* 1, no. 3 (1957), 255.

and entry cards, which contain information about the text at the unit and linguistic level) can now be printed for the scholar “on sheets, in brochures or books or on other cards. Valuable tools in philological research like an index verborum or concordance are available without further scholarly effort.”³⁷

When reflecting on Busa’s technical plan, the dance between human and machine that it entailed, Winter perceptively concluded: “Father Busa, with IBM’s enabling help, was at the pivot point (or was the pivot point) between handmade scholarly tools and machine-made scholarly tools.”³⁸

From our oral history interviews, we can extend Rockwell and Sinclair’s case studies with a fourth example of a forgotten text analysis technology: a kind of finding device, or a kind of paper-based search engine,³⁹ that Wilhelm Ott devised to allow readers to navigate the material contained in his publications on the metrical analysis of various Latin poems. This case study further exemplifies the humanistic-machinic pivot point in the history of digital humanities tools.

Case study: Wilhelm Ott

Having completed his PhD in New Testament theology in 1965 at the University of Würzburg, Wilhelm Ott took up the position of research officer at the Computing Center of the University of Tübingen in 1966. In 1970 he also became head of the Division for Literary and Documentary Data Processing and it was there that the Tübingen System of Text Processing Programs (TUSTEP) was developed. In addition to his work on TUSTEP, Ott was engaged in

³⁷ Ibid.

³⁸ Winter, “Roberto Busa S.J. and the Invention of the Machine-Generated Concordance,” 16.

³⁹ Though information processing has become synonymous with digital computing, a long history of the use of analogue and electromechanical devices for information processing precedes the use of digital machines and, to some extent, runs alongside them too. On the history of punched cards for information processing see, for example, Lars Heide. *Punched-Card Systems and the Early Information Explosion, 1880–1945*. (Baltimore: The Johns Hopkins University Press 2009); on paper-based computing see, for example, Mark Lorenzo Jones. *The Paper Computer Unfolded: A Twenty-First Century Guide to the Bell Labs CARDIAC*. (Philadelphia Pitsburg: SE Books 2017).

other quite high-profile activities in the field of digital humanities (or humanities computing as it was then known). He provided specialised support for many humanities computing projects in Germany, such as Bonifatius Fischer's work on a concordance to the Vulgate. From 1973 until 2004, Ott organised a "colloquium on the application of electronic data processing in the human sciences" (*Kolloquium zur Anwendung der EDV in den Geisteswissenschaften*) at the University of Tübingen. From an early stage on, he was also engaged in research commercialisation. In 1973 he became co-founder of the firm Pagina, which now specialises in XML and other aspects of electronic publication. In recognition of his contributions, in 2007 the Alliance of Digital Humanities Organisations (ADHO) bestowed the Busa award upon him.

In 2015, Ott participated in an oral history interview with Nyhan, during which he recalled the first instruction in computing that he took in the *Deutsches Rechenzentrum* (German Computing Centre) in Darmstadt in 1966. In this interview he recounts that having become somewhat inattentive to the practical tasks that he and other students on the course were asked to complete, he turned his attention to writing a computer program to automate the metrical analysis of dactylic hexameter poetry, a research problem that had been occupying him for a while and that he expected to be amenable to computing. The program worked and his research on the metrical analysis of Latin hexameters would occupy him for the next nineteen years. The output of this work was published incrementally with Niemeyer, between 1970 and 1985.

During the visit to Ott in Tübingen in 2015, Nyhan had the opportunity to peruse his library, and the editions of the metrical analysis that it contained and noticed that some of the editions were accompanied by what appeared to be a small stack of punched cards. In conversation with Ott, she determined that the punched cards functioned as a kind of paper search engine to the material contained in the editions, in the sense that they permitted the material to be searched and navigated in response to user-generated queries posed via the cards.

Up until the 1970s, punched cards were widely used in humanities computing projects – also in Busa's *Index Thomisticus* project. Busa's punched cards, however, served a quite different function from those of Ott. For Busa, they were very much a vehicle for encoded data. The punched cards of the *Index Thomisticus* were routinely transformed to another storage medium (like magnetic tape) so the encoded information could be processed serially, further manipulated and ultimately printed (which, as mentioned above, was *de rigueur*

during the period under discussion).⁴⁰ The idea of utilising the punched cards post-printing to facilitate the interrogation of the published work seems to be a largely forgotten example of a material infrastructure for text search and analysis, in the vein of the forgotten text analysis tools discussed by Sinclair and Rockwell.⁴¹

In conversation with Nyhan, Ott described how the punched cards worked, while recalling where the inspiration for his approach had come from:

Wilhelm Ott (WO): The problems that I wanted to solve (in addition to providing overviews for the hexameter poetry) I had drawn from the appendix to the commentary of Eduard Norden to the sixth book of the *Aeneid* (1957). He was convinced that metrics were important for interpreting a poem and had a lot of criteria that he looked for: the number of words and the position of the word endings in respect to the verse structure. In the middle of a hexameter there is normally also a caesura (or a pause) and he also looked for where exactly this caesura is on average, or in most verses, and so on.

Therefore, one of the tools I provided, and which I thought it was possible to provide beyond the printed lists, was a tool to allow one to look for combinations of word endings in the verse. I thought that it could be done relatively easily using a punched card. The punched card had eighty columns, with at least ten positions which could easily be numbered vertically. Additional rows twelve and eleven, as they were called, were not used for representing the number of lines, or the number of verses. Therefore, I provided sixteen punched cards, one for each position in the hexameter, as the hexameter consists of six feet, and each foot can have either two or three syllables: two long syllables, or one long syllable and two short syllables (that makes sixteen times three, or eighteen, but the verse end is always a word end, therefore it can be neglected, and the last foot is almost always two syllables only. That meant I had sixteen positions that were interesting).

And so, I provided sixteen punched cards. On each card I made a hole in the respective position. Where, for example, a word ended just after the first syllable in

⁴⁰ Nyhan, *Hidden and Devalued Labour in the Digital Humanities*.

⁴¹ Sinclair and Rockwell, "Towards an Archaeology of Text Analysis Tools."

line three of a poem, then in column zero, in row three, I made a hole in the first card, this meant there is a monosyllabic word at the beginning of the verse. And this I did for the sixteen positions in the verse and for every line. Then, if you want to see if, for example, a verse starts with a monosyllable, and ends with a monosyllable, you just take the first and last card and put them together, one above the other, hold them against the light, and where the holes are shining through, there you have the number of the lines of the verses which start and end with a monosyllabic word. It's as easy as this.

Julianne Nyhan (JN): And where did the idea for this come from?

WO: Well, I was accustomed to punched cards. Data entry was on punched cards and some output was on punched cards for further processing. The compiled programmes were also on punched cards. So, for a second run, if you have the same programme but different data, you could just use the binary text of the programme to produce it. I was also aware of some people's work with so-called *Randlochkarten* [edge-punched cards] where one could sort the material by mechanical means ...

JN: *Randloch* is the hole at the side of the card?

WO: It was cards where the content was written by hand and on the margin of those cards was a perforation, I think it was, and you could cut this to the margin with the help of a special scissors, so that if you got a needle or a nail or something to go through a notched hole and lifted the needle, the respective cards would fall back. This is a mechanical tool I also knew, and I thought such approaches to inspection could aid this problem.⁴²

As space does not allow detailed discussion of the *Randlochkarten* referred to by Ott, a brief outline must suffice. *Randlochkarten* seem to have been quite commonly used for manually

⁴² This text has been reproduced, with permission, from Nyhan and Flinn, *Computation and the Humanities*, 63-64.

sorting and managing punched cards. Halmann, for example, when introducing his “multi-sorter for separating edge-punched cards,” writes: “In the usual technique of manual sorting of punched cards, a needle is used to separate about 200 cards at a time.”⁴³ Kelly states that in the US they were called McBee Keysort Cards and often used in library settings: “Before the advent of computers [they] were one of the few ways you could sort large databases for more than one term at once. In computer science terms, you could do a ‘logical OR’ operation.”⁴⁴

Various references to the cards can also be found in publications of projects that fell within the interests of Digital humanities and Computational Linguistics. For example, a report written for the European Atomic Energy Community (EURATOM) in 1963 describes “a method developed [sic] . . . for preparing a five-lingual card file by using edge-notched cards . . . The card file is especially useful for translation and terminology services for several languages, where new terminologies in the science and technology field are recorded.”⁴⁵ A 1974 research report describes their uses in Soviet historiography and mentions three formats of cards in use: “[Two such methods are described in the Russian literature to hand: edge-notched cards, the *Sichtlochkarte*, and the dual card which is a special form].”⁴⁶ The report goes on to describe how and by whom they were used and writes that “[In 1962 Edge-punched cards were introduced to the Estonian Academy of Sciences on a large scale so that by 1965 half of the staff used them] (translation Nyhan).”⁴⁷ Though such cards now appear to be a dead, mostly forgotten technology they offer an interesting case study in the context of the media archaeology of Digital humanities (and beyond) and it would be intriguing to follow other references to their uses in other historical Digital humanities projects.

⁴³ M. Halmann, “A Simple Multi-Sorter for Separating Edge-Punched Cards,” *Journal of Chemical Documentation* 1, no. 2 (1961), 78.

⁴⁴ Kevin Kelly, “One Dead Media,” *The Technium* (2008), online at <http://kk.org/thetechnium/one-dead-media/> (accessed 22 April 2021).

⁴⁵ A. Kreuzler and Graf K. Ch. Rothkirtch-Trach, *Randlochkarten als Sprachwörterkartei* (Brussels: European Atomic Energy Community, 1963), 3, online at <http://aei.pitt.edu/60342/> (accessed 22 April 2021).

⁴⁶ Manfred Alexander, “Zur Verwendung von Lochkarten, elektronischer Datenverarbeitung und statistischen Methoden in der sowjetischen Historiographie,” *Jahrbücher für Geschichte Osteuropas* 22, no. 1 (1974), 92 (translation ours).

⁴⁷ *Ibid.*

The promise of oral history for digital humanities

The case study that is given above of the punched-card based text navigation and analysis tool that was devised by Ott and the case studies by Sinclair and Rockwell referenced previously, especially that of Glickman, alert us to the way that actors other than Busa also pirouetted on the so-called 'pivot point' and that it endured, or was remade, beyond the geographical and temporal confines of the *Index Thomisticus* project.

Ott's combinatorial tool is an exemplification of this: it seems to pivot between genres and technologies, and between the old and the new in an intriguing bricolage. Ott's navigation aid repurposed the punched card technology that had been used to input the textual content of his metrical analysis for processing so that it could facilitate an engagement with, and command over text that went beyond the fixity of the traditional index and book. Ott did not offer a standard alphabetic index or word frequency table to readers, rather he wanted to allow them to search at a much higher resolution, for "combinations of word endings in the verse." To do so, Ott did not use the computational infrastructures, affordances and tools that are now considered synonymous with Digital humanities. Rather, he utilized the inherent flexibility and recombinant nature of the shared, paper-based materiality of the book and the punched card to push forward analogue information management and retrieval technologies. The form of the punched cards, with their rows and columns, the possibility of detaching the cards from the fixity of the printed book, and of holding them against the light, so that they could then disrupt the fixity of the printed book, were identified by Ott as having potential to open a multi-layered, embodied and combinatorial interrogation of printed verse. And in doing so, Ott used a paper-based technology in an innovative way that could supersede the limitations of the newer mainframe-based computing of his day where interactive computing was, for most of those who worked in Humanities departments, still some way off.

Within the context of Ott's work this example of a forgotten text technology gives us an insight into the kinds of access that Ott hoped to provide, even though neither the standard book technologies of the day, nor, indeed, the computational tools of the day could directly facilitate it in their dominant forms.⁴⁸ In this way Ott's now forgotten text analysis and

⁴⁸ For a wider discussion of how old technologies do not necessarily disappear but can go on to bolster and enable newer technologies in consequential yet often overlooked ways see Edgerton, David. *The Shock Of The Old: Technology and Global History since 1900*. (Profile Books, 2019).

navigation tool offer new approach routes to the history of digital humanities and underline again the importance of Sinclair and Rockwell's call for 'digital humanities archaeology'.⁴⁹ That oral history can play an important role in 'thickening' such an archaeology is also suggested by Ott's interview, which gave space for Ott to contextualise the development of the tool within his own personal history of encountering quantification, mechanisation and computation in the Humanities, in a way that is not routinely captured in the computing and academic literature that accompanies text technologies, again amplifying the thesis of Sinclair and Rockwell.

Conclusion

The case study of Ott's 'paper search engine' speaks to the history of digital humanities and points to transversal routes across the history of the humanities and the history of the digital humanities. Considered next to other forgotten technologies, Ott's interview is one example of how oral history can open the possibility of understanding the history of Digital humanities not as a series of revolutionary and triumphalist developments but as a something that was, of course, deeply interconnected with and influenced not only by the issues and ideas of its days but also by its expansive material, informational and intellectual background.⁵⁰ This may seem like an obvious point to make but, as we have argued elsewhere, the history of digital humanities has tended to be overlooked until recently and it has sometimes been portrayed as a development that is unmoored from its longer historical contexts.⁵¹

The case studies above attest to how Busa, Glickman, Ott and Smith sought to wrangle the atomic and sub-atomic units of text e.g., individual words and syllables, so that they could be identified, tracked, combined and recombined in various way that could support the creation of new knowledge and result in interpretative purchase. At first glance one might

⁴⁹ Sinclair and Rockwell, "Towards an Archaeology of Text Analysis Tools," 357.

⁵⁰ On the longer history of text technologies and information management tools see, for example, Ann M. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven, CT: Yale University Press, 2011) and Markus Krajewski, *Paper Machines: About Cards & Catalogs, 1548-1929*, trans. Peter Krapp (Cambridge, MA: MIT Press, 2011).

⁵¹ See Nyhan, Julianne, Andrew Flinn, and Anne Welsh. "Oral History and the Hidden Histories Project: Towards Histories of Computing in the Humanities," *Digital Scholarship in the Humanities* 30, no. 1 (2015), 71-85.

presume that such a perspective was new and that it emanated from computing technology (after all, printed books usually produced fixed representations of their contents and allowed those contents to be accessed through standard paths like alphabetical or thematic indexes, page layout or chapter arrangement).

Yet, the ability to recognise and manipulate atomic units of text far preceded computational technology. For example, it is now quite common for dictionaries to be organised alphabetically. Yet, for the vast majority of their history dictionaries were organised thematically; it was not until after the printing press that complete alphabetisation became widespread. MacArthur has argued that this is due to the advent of movable type and the way that the letters of the alphabet existed for the first time as tangible, individual, hard metal objects. As people involved in the printing press began to touch and re-order letters, the advantages of the alphabetical system may have been impressed upon them, and, he contends, gradually an awareness of this system spread from people involved in making fonts to people who thought and theorised about letters and words:

Where scholars and copyists had previously been unaccustomed to thinking of words and even parts of words alphabetically, printers were now spending a great part of their time doing nothing else. Sheer familiarity with hard physical objects in a very practical craft appears, therefore, to have promoted interest in alphabetical order in other, related but more abstract fields.⁵²

The text analysis tools developed by those such as Busa, Glickman, Smith and Ott also sought to model and find patterns in and with the texts and text technologies they attended to. The attention to forgotten technologies, then, can alert us not only to the technology itself, but to the ways text itself has been conceptualised and studied across longer trajectories with a multiplicity of tools in the humanities and digital humanities. Accordingly, oral history has the potential not only to inform histories of digital humanities but to grant insight into the shape that the Humanities has taken, over the *longue durée*.

⁵² Tom McArthur, *Living Words: Language, Lexicography, and the Knowledge Revolution* (Exeter: University of Exeter Press, 1998), 41-43.