Borgesian Dreams and Epistemic Nightmares: the Effects of Early Computer-Use on French Medievalists (1970-1995)

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Abstract

This study focuses on the affective, epistemic, and social effects of the introduction of computers in European professional medieval history between ca. 1970 and 1995. A study of the reaction of a distinct and relatively small group of (mostly) French scholars to this new and evolving technology over the course of three decades unveils the emotional-epistemological effects of using computer-based technologies in medieval history. This history thus reveals the ways in which medieval history changes in four different dimensions: the self-referential, the physical, the social, and the epistemological. The history of the acceptance of, and resistance to, computers also opens up a new space for reflection on both paradigmatic and gradual change in the theory of history, thereby highlighting the importance of including the history of information in theoretical reflection on history as a practice.

Keywords: History of Historiography, Sociology/History of Knowledge, Medieval History, Computer Science, Theory of History, Paradigms.

The central concern of this article is the affective, epistemic, and social effects of the introduction of computers on French medieval history between 1970 and 1995.[1] Its broader goal is to plea for an 'object-integrative' approach to historiography, in which the attribution of at least a limited kind of agency to instruments such as computers is included. After analyzing three distinct stages of medievalists' emotive-epistemological reactions to computers, I found that the history of medievalists using this heuristic instrument not (i) merely sheds light on four changing dimensions of the medievalist craft, but also on (ii) the theorization of 'paradigms' in historiography. Indeed, the general lack of attention to computer-based practices within history has led both historiographers and theorists of history to undervalue the role of instruments as catalysts for historiographical change.[2]

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[2] See especially Rolf Torstendahl, *The Rise and Propagation of Historical Professionalism*, Routledge Approaches to History 8 (New York: Routledge, 2015); Rolf Torstendahl, "Explaining Evidence and the Revolution of Historiography from the Nineteen-Sixties to Nineteen-Ninety", *Storia della Storiografia*, 73 (2018): 71-87. This discussion is inspired, of course, by Thomas Kuhn, *The Structure of Scientific Revolutions: 50th Anniversary Edition*, ed. by Ian Hacking, 4th ed. (Chicago: University of Chicago Press, 2012).

Though the history of medieval history and computing can be traced back to the late nineteen-fifties, when the Jesuit priest Roberto Busa started the development of his *Index Thomisticus* in collaboration with IBM, computers only gained traction amongst a larger share of medievalists during the nineteen-sixties.[3] From the early nineteen-seventies on, scholarly networks started forming around the sharing of counting techniques, research programs, and solutions to technical problems specifically for non-literary historical sources.[4] The highly specialized treatment of program languages and database designs was almost always supplemented by methodological and theoretical reflection on the epistemological-practical implications of using these instruments, and as such the rethinking of the entire medievalist métier was (said to be) put on the table.

Bibliometric research shows that this subfield specifically flourished through activities in France, where the serial organization of workshops and conferences by the Centre nationale de recherche scientifique (C.N.R.S.) and the publication of the journal *Le Médiéviste et L'Ordinateur* (*MO*, 1979-2004) supported the institutionalization of this field.[5] In 1986, the International Association for History and Computing saw the light, and around 1995 the entire enterprise of working with computers underwent several transformations due to the rising popularity of the Internet.[6] Increasingly, French medievalists gathered together with other specialists, and national networks seem to have taken on an increasingly international character through online activities.[7] The last big C.N.R.S. French round-table conference on computers and history was organized in 2008, thirty-three years after the first and seminal one; it had the programmatic title *Les historiens et l'informatique: un métier à réinventer*. The introduction clearly states: "most of the devices for diffusion and communication [created in the 1970s-1990s] have, today, disappeared."[8]

[3] The Index is now consultable online, see: Eduardo Bernot and Enrique Alarcón, "Corpus Thomisticum. Index Thomisticus by Roberto Busa SJ and Associates", Corpus Thomisticum, 2005, http://www.corpusthomisticum.org/it/index.age; IBM, "Pioneering the Computational Linguistics and the Largest Published Work of All Time", Online archive, 2011, https://web.archive.org/web/20120327122219/http://www.ibm.com/ibm100/it/en/stories/linguistica_computazionale.html.

[4] See for example the Canadian CAMDAP group (*Computers and Medieval Data Processing*, 1971-1987), and for Europe especially the joint-written article: Léopold Genicot, "Pour une organisation de la recherche en histoire médiévale", *Francia*, 1 (1972): 692-698.

[5] French institutes played a major role in organizing the first conferences for medievalists and computers (see section I), and the absolute numbers of publications between 1969-2005 show that 43.75% of all publications were published in French (records from *International Medieval Bibliography*). I also want to point at the large share of French medievalists that published in journals such as *History and Computing* (1986-1998), *Computer and the Humanities* (1966-2004), and that attended and organized conferences on computing for all period-specializations. French medievalists moreover were well aware that they displayed an "early interest in the potentialities of computers": Jean-Philippe Genet, "Medieval History and the Computer in France", *QUANTUM Information*, 5 (1978): 3.

[6] On the history of the AHC, see: "The Annual AHC Conferences", The Association for History and Computing, 2001, http://odur.let.rug.nl/ahc/confer/index.html; "What Is the AHC?", The Association for History and Computing, 2018, http://odur.let.rug.nl/ahc/intern/assoc.html.

[7] On the growing popularity of international networks in France, see: CNRS, "Ménestrel. Médiévistes sur le net: Sources, travaux et références en ligne", Ménestrel, January 22, 2018, http://www.menestrel.fr/spip.php?rubrique618&lang=fr; "Objectives", FIDEM - Fédération Internationale des Instituts d'Études Médiévales, 2014, http://fidemweb.org/objectives/.

[8] Jean-Philippe Genet, "Introduction", *Les historiens et l'informatique: Un métier à réinventer, Rome, décembre 2008*, ed. by Jean-Philippe Genet and Andrea Zorzi, Collection de l'École française de Rome 444 (Rome: École française de Rome, 2011), 5.

Around 1995, new buzzwords and ideas started to gain popularity amongst computer-using medievalists, given they progressively worked within the new framework of the 'wired' or the 'online'. In 2004 'humanities computing' was rebranded as 'digital humanities', and ever since the peculiar early history of historians and computing has been obscured by the 'revolution' that was the Internet.[9] As witness, for example, Peter Haber's *Digital Past* (2011), Wolfgang Schmale's *Digitale Geschichtwissenschaft* (2010), and the multi-authored volume *Clio Wired* (2011), the messy history of historians using punch cards, magnetic tape, floppy disks, and, later, CD-ROMs has often been ignored, and otherwise overshadowed by an attention to the online and/or the digital only.[10] But as was noted by Ilaria Porciani and Jo Tollebeek, it is high time to integrate those "many aspects of [the] process of transformation from analogue to digital" in historiographical research – especially with a so-called historiographical 'practical turn', inspired by the sociology of science and knowledge, in mind.[11]

In what follows, I first briefly sketch the history of the (European) subfield of medieval history and computing, which automatically touches upon the history of data processing via various logical data models (hierarchical, network, and later, relational) as well.[12] I subsequently discuss three 'emotive-epistemological' stages that characterize the way French medievalists reacted to computers. The first is a hopeful one, captured best by the label of a "Borgesian dream" – to quote Jean-Philippe Genet looking back onto the 1970s and early 1980s in 1987.[13] It found its roots in medievalists' realizations that certain historiographical questions all of a sudden became answerable with the introduction of the computer, though they gave other reasons for their optimism as well. The second stage overlaps with the first, yet became more prominent towards the end of the 1980s; it is best characterized as one of nervousness. Anxieties over both practical and epistemological chaos were expressed ever more frequently, and the idea that medievalists were constantly reinventing the wheel loomed large. Direct action intended to ease communication was undertaken,

[9] *A Companion to Digital Humanities*, ed. by Susan Schreibman, Ray Siemens, and John Unsworth (Malden: Blackwell Publishers, 2004).

[10] Peter Haber, *Digital Past: Geschichtswissenschaft im Digitalen Zeitalter* (Munich: Oldenbourg Verlag, 2011); Wolfgang Schmale, *Digitale Geschichtswissenschaft* (Vienna: Böhlau Verlag, 2010); *Clio Wired: The Future of the Past in the Digital Age*, ed. by Roy Rosenzweig and Anthony Grafton (New York: Columbia University Press, 2011).

[11] Jo Tollebeek and Ilaria Porciani, "Historians and the Web", *Setting the Standards. Institutions, Networks and Communities of National Historiography*, ed. by Ilaria Porciani and Jo Tollebeek, Writing the Nation, II (London: The European Science Foundation; Palgrave Macmillan, 2002), 420. On the 'turn' to sociology of science/knowledge within historical theory and historiography, see: Marek Tamm, "Truth, Objectivity and Evidence in History Writing", *Journal of the Philosophy of History*, 8 (2014): 270. In this spirit I also read John H. Zammito, "History/Philosophy/Science: Some Lessons for Philosophy of History", *History and Theory*, 50 (2011): 390-413.

[12] See on those problems specifically Charles Harvey and Jon Press, *Databases in Historical Research. Theory, Methods and Applications* (Houndmills: Macmillan, 1996), 25-39.

[13] Jean-Philippe Genet, "Introduction", *Standardisation et échange des bases de données historiques. Actes de la Troisième Table Ronde Internationale tenue au L.I.S.H. (C.N.R.S.), Paris, 15-16 mai 1987*, ed. by Jean-Philippe Genet (Paris: C.N.R.S., 1988), 15. The specific literary piece Genet seems to have in mind: Jorge Luis Borges, "The Library of Babel", *Collected Fictions*, trans. Andrew Hurley (New York: Penguin, 1998), 112-118. Another option, in the same spirit, would be: Jorge Luis Borges, "On Exactitude in Science", *Collected Fictions*, trans. Andrew Hurley (New York: Penguin, 1998), 325.

which mostly resulted in the set-up of institutions. Thirdly, at the end of the 1980s and the beginning of the 1990s, when computers were being used by an increasing number of medievalists, the pioneering medievalists who had been so hopeful in the 1970s experienced the feeling of being very overwhelmed: grand-scale international action, with attempts at standardization both of coding language and software followed.

I. Emerging Networks

To reconstruct the institutional history of the emerging subfield of 'medieval history and computing', I have leaned first on a bibliometric analysis of publication records taken from the *International Medieval Bibliography*, which includes specialized publications in sixteen different languages.[14] Inasmuch as this enabled the identification of key institutions, medievalists, and publications, I subsequently focused on 'meta-historical' journal articles about computing, manuals for data processing, and lists and announcements of conferences published by these institutions and scholars within the timeframe 1970-1995.[15] As a result, it became clear which medievalists frequently contributed, where, when, with what scholarly goals, and what hardware they used.

Around 1970, there existed about twenty-four large-scale quantified and computerized projects both in medieval and early modern history in Europe alone.[16] In most cases computers were being used in a 'philological', heavily word-oriented spirit, as medievalists together with linguists and theologians aimed at counting words and finding concordances – tactics that are useful both for tracing the history of (e.g. political) concepts and studying changes in, e.g., High German spelling.[17] This philological attitude also explains why a kind of 'text edition' made with computers was thought of as an important result of (very time-consuming) labor early on. Many early discussions indeed revolved around the question of whether to include sources full-text in databases or not, which were seen as "open" and could be shared after personal use.[18]

[14] In comparison with e.g. *JSTOR* and *Regesta Imperii*, the *International Medieval Bibliography* provided a sufficiently large collection (ca. 400 records) that was still specialized enough: *International Medieval Bibliography*, ed. by the University of Leeds (Leeds and Turnhout: International Medieval Institute and Brepols Publishers, 1995-2018).

[15] A selection of useful contemporary overviews: Vern L. Bullough, Serge Lusignan, and Thomas H. Ohlgren, "Report: Computers and the Medievalist", *Speculum*, 49 (1974): 392-402; Lucie Fossier, "Informatique et histoire médiévale à l'Institut de Recherche et d'Histoire de Textes", *Computers and the Humanities*, 12: Medieval Studies and The Computer, no. 1/2 (1978): 109-112; Lucie Fossier and Marie-Josèphe Beaud, "Introducing the Institut de Recherche et d'Histoire des Textes (C.N.R.S.): Medieval Book and Computer", *Computers and the Humanities*, 20: Activities in France Part II (1986): 267-268. A short intro on the history of computing in France: Pierre E. Mounier-Kuhn, "Prologue: History of Computing in France", *Annals of the History of Computing*, 11 (1989): 237-240. More recent historiographical overviews can be found in: Onno Boonstra, Leen Breure, and Peter Doorn, *Past, Present and Future of Historical Information Science*, 2nd ed. (Amsterdam: NIWI-KNAW, 2006), 25-35; Lawrence J. McCrank, *Historical Information Science: An Emerging Unidiscipline* (Medford: Information Today, 2001), 483-493; Genet, "Introduction", 2011, 5 (esp. footnotes 11 and 12).

[16] McCrank, *Historical Information Science*, 483.

[17] I think especially of the "New Political History" of Gerd Althoff and Gerard Otto Oexle: Gerd Althoff, "Möglichkeiten und Grenzen Elektronischer Datenverarbeitung bei der Erforschung der Geschichte des Mittelalters", *Computers and the Humanities*, 12: Medieval Studies and The Computer, no. 1/2 (1978): 97-107.

[18] This issue was discussed most vehemently and frequently by Léopold Genicot and Paul Tombeur, two Belgian medievalists working at the CETEDOC (Université Catholique de Louvain-la-Neuve): Paul Tombeur and André Stainier, "Les méthodes et les travaux du Centre de Traitement Électronique des Do-

From ca. 1970 to ca. 1990, social and economic historians likewise used their "machines à classer" to mine medieval documents – charters, sentence books, acts of parliaments, ownership lists, etc.[19] French *Annales*-inspired historians such as Michel Mollat, Jean Glénisson, and Jean-Philippe Genet; American medievalists such as David Herlihy (with Christiane Klapisch) and Theodore Evergates; and important German historians like Walter Schlesinger all used the computer as a device to calculate demographic and economic trends.[20] Yet while small groups of medievalists from all over Europe and across the Atlantic had been meeting both at general conferences like Kalamazoo/Leeds since the late nineteen-sixties, and at specialized ones sponsored by the French C.N.R.S., many other medievalists in the early nineteen-seventies were still off the computer-track. In 1978, Emilio Saez had to report that in Spain computer-based methods were "thought about" but had not yet produced results.[21]

Computer-use was stimulated somewhat by the introduction of the personal computer around 1977, which was also called a 'microcomputer'.[22] Between 1980 and 1984, French medievalists were in the process of transporting records organized for mainframe computers such as the IBM 3032 and 3033 to personal computers. But with their eyes set first and foremost on the now famous Apple II – not so much on the Commodore Pet – and complaining about the price and limited storage, most (French) medievalists were not immediately convinced.[23] Only after the introduction of the Macintosh in 1984, and with the realization that software for microcomputers was becoming ever more compatible, the resistance to personal computers was overcome.[24]

Though after 1985 linguistic research and socio-economic big data analysis remained relatively popular, at least within the community of computer-using medievalists, other research domains gained popularity as well. With floppy disks becoming ubiquitous, prosopographical research (i.e. the investigation of the common characteristics of certain social groups) revived amongst medievalists in the nineteen-

cuments", *Bulletin de Philosophie Médiévale*, 10-11-12 (1968): 141-174; Paul Tombeur, "Informatique et étude de textes médiévaux: Méthodes, outils de recherche et projets", *Bulletin de Philosophie Médiévale*, 39 (1997): 31-44.

[19] The expression "machine à classer" comes from the French medievalist Georges Duby, who in his 1991 memoir looked back on his early use of computers and whose students (e.g. Monique Zerner) were part of the editorial committee of *Le Médiéviste et L'Ordinateur*: Georges Duby, *L'Histoire continue* (Paris: Editions O. Jacob, 1991), 68.

[20] Cf. the signatories of Genicot's plea: Genicot, "Pour une organisation de la recherche en histoire médiévale", 697-698.

[21] Emilio Saez, "Projet de recherche sur les structures socio-économiques de la Catalogne au XIII^{e} siècle", *L'Histoire médiévale et les ordinateurs. Medieval History and Computers. Rapports d'une Table Ronde Internationale Paris 1978*, ed. by Karl Ferdinand Werner (Munich: Institut Historique Allemand, 1981), 19. Overview of conferences in Lucie Fossier et al., "Vingt ans d'informatique en histoire médiévale", *Bibliographie de l'histoire médiévale en France (1965-1990)*, ed. by Michel Balard (Paris: Publications de la Sorbonne, 1992), 437-449.

[22] On the introduction and development of micro-computers before and after 1977, see the seventh and eight chapters in Paul E. Ceruzzi, *A History of Modern Computing*, 2nd ed. (Cambridge (Mass.): MIT Press, 2003), 207-280.

[23] Specifically on the IBM models, including hand-made drawings: Maria Hillebrandt and Franz Neiske, "Les problèmes de l'onomastique médiévale dans le couplage", *MO*, 4 (1980): 8; Ruddy Lelouche, "Un nouveau centre de calcul: Le C.N.U.S.C.", *MO*, 7 (1982): 18.

[24] Jean-Luc Minel, "Le micro-ordinateur est-il un panacée?", *MO*, 9 (1983): 2.

nineties, especially in The Netherlands and Belgium.[25] This so-called 'new prosopography' benefited from relational database-structures that had become more popular in the decade before.[26] Other types of research that attracted medievalists to computers were archaeological, architecture-historical, and musicological.[27] With the invention of the scanner, the already-popular computer-aided analysis of manuscripts likewise broadened in scope, and medievalists increasingly started thinking about manuscripts themselves in contrast to computers.[28]

The interactions between medievalists and computers took place all over Europe and North America, nonetheless it is clear that certain research centers and universities took the lead. Within Europe, early uses of computers by medievalists in the 1960s and 1970s were located most notably at the University of Louvain-la-Neuve's Centre de Traitement Électronique des Documents Médiévaux (CETEDOC) in Belgium; at the national Institut de Recherche Historique des Textes (I.R.H.T.), the Université de Nancy, the Centre d'Études Supérieures de Civilisation Médiévale de Poitiers, and the Sorbonne in France; at the Literary and Linguistic Computing Centre at Cambridge University and the Computing Laboratory at Oxford University in England; and at the University of Pisa in Italy.[29] With Manfred Thaller, the German Max Planck-Institut für Geschichte in Göttingen became more prominent in the 1980s, as they developed the specific database-system *kleio* for historians.[30] In North America, the Institut d'histoire médiévale at the University of Montréal, up to today an important center for North American Medieval Studies, was an early partaker in producing both computer-based results in medieval history and methodological-theoretical articles, and individual medievalists at Western Michigan University, the University of Western Maryland, UCLA, and Stanford likewise worked with computers.[31]

[25] See *Prosopography and Computer. Contributions of Mediaevalists and Modernists on the Use of Computer in Historical Research*, ed. by Koen Goudriaan et al. (Leuven: Garant, 1995).

[26] Goudriaan et al., 2; Boonstra, Breure, and Doorn, *Past, Present and Future of Historical Information Science*, 31-32, 35.

[27] Archaeologists had been using automatic classification before medievalists did so, but specifically for archaeologists working on medieval sites, the first reference I found was from 1978, the second from 1983; the numbers go up from there. See also: Jean-Philippe Genet, "Éditorial", *MO*, 7 (1982): 1.

[28] An entire *MO* issue was devoted to the scanner in 1987 (issue 17). A clear example of idealizing manuscripts in opposition to computers: Michael Camille, "Sensations of the Page: Imaging Technologies and Medieval Illuminated Manuscripts", *The Iconic Page in Manuscript, Print, and Digital Culture*, ed. by George Bornstein and Theresa Lynn Tinkle (Ann Arbor: University of Michigan Press, 1998), 33-53.

[29] Bullough, Lusignan, and Ohlgren, "Report: Computers and the Medievalist"; McCrank, *Historical Information Science: An Emerging Unidiscipline*, 484-486. In Italy, Roberto Busa's Centro per l'Automazione dell'Analisi Linguistica (CAAL) at Gallarate (Milan) of course remained important, but with Antonio Zampolli, a student of Roberto Busa, the first Italian scientific institute entirely dedicated to research in the field of Computational Linguistics was founded in Pisa, with money from the Italian National Research Council. This institute today bears Zampolli's name, see: Paola Baroni, "Antonio Zampolli - The Founder of ILC", Institute for Computational Linguistics "A. Zampolli", 2018, http://www.ilc.cnr.it/en/content/antonio-zampolli-founder-ilc.

[30] Thaller on his time in Göttingen: Manfred Thaller, "Between the Chairs. An Interdisciplinary Career", *Historical Social Research/Historische Sozialforschung*, 29: Supplement From History to Applied Computer Science in the Humanities (2017): 17-46.

[31] The Institut d'histoire médiévale at the University of Montréal was renamed the Centre d'études médiévales in 1994; George T. Beech, "Computer-Aided Research in Medieval History in the USA and Canada through 1977", *L'Histoire médiévale et les ordinateurs*, ed. by Karl Ferdinand Werner (Munich: Institut Historique Allemand, 1981), 21-23.

Out of all these institutes, the French I.R.H.T, and the community of editors/contributors around their journal *Le Médiéviste et l'Ordinateur*, clearly took an early lead. Backed by generous and continuous sponsorship of the French national government, the I.R.H.T. had from its foundation in 1937 been collecting microfilms of medieval manuscripts, and thus a habit of collecting and standardizing was intrinsic to this independent research institution.[32] When computers 'entered' the field and medievalist Jean Glénisson took on the position of director in 1965, medievalists found a welcoming institutional environment to sponsor round-table conferences and set up a specialized journal.[33] Glénisson moreover promoted a collaborative spirit within the institute, organizing the sub-divisions in *laboratoires*, which enabled the coming together of various French researchers who had been, for a while, working independently.[34] Lastly, the I.R.H.T. has always been known to specifically "welcome specialized subdisciplines, of a marginal nature in the university".[35]

After convening in the early 1970s, the French I.R.H.T. medievalists succeeded in dominating this subfield of 'medievalists and computing' up to ca. 1995. This continued predominance must be explained not merely by their early organization, but also by the dominance of social and economic history amongst French medievalists from the 1960s on.[36] The *Annales* school mentally prepared many scholars for integrating quantification into the study of the Middle Ages, and as French medievalists continued to make up a significant portion of the national historical profession (up to 18%, still, in 1984), they likewise occupied the forefront of working with computers.[37] In 1986, with more than 150 participants from over 19 countries, the International Association for History and Computing was set-up at Westfield College (University of London). At that point, it was clear that exactly these medievalists (Fossier, Genet, Glénisson, Millet, Bourlet, etc.) had been amongst the earliest scholars within the discipline of history to both work with and reflect on computers.[38]

[32] Louis Holtz, "L'Institut de Recherche et d'Histoire des Textes (IRHT). Premier laboratoire d'histoire au Centre national de la recherche scientifique", *Les cahiers du centre de recherches historiques*, 35 (2005): 1-7.

[33] Bernard Barbiche, "Jean Glénisson (1921-2010)", *Bibliothèque de l'école des chartes*, 168 (2010): 622.

[34] Thierry Buquet, "Du Médiéviste et L'Ordinateur aux éditions en ligne de l'IRHT: Enjeux d'une politique éditoriale électronique", *Communication présentée lors du colloque "Les écritures d'écran": Histoire, pratiques et espaces sur le web, 18-19 mai 2005, Aix-En-Provence*, 2005, http://www.imageson.org/document636.html; Louis Holtz, "L'IRHT, au fil des ans", I.R.H.T., 2007, https://irht.hypotheses.org/1293; Lucie Fossier, "Informatique et histoire médiévale en France", *L'Histoire médiévale et les ordinateurs*, ed. by Karl Ferdinand Werner (Munich: Institut Historique Allemand, 1981), 34.

[35] Emanuelle Picard, "France", *Atlas of European Historiography. The Making of a Profession, 1800-2005*, ed. by Ilaria Porciani and Raphael Lutz, Writing the Nation, I (London: European Science Foundation; Palgrave Macmillan, 2010), 135-136.

[36] Raphael Lutz, "Flexible Response? Strategies of Academic Historians Towards Larger Markets for National Historiographies and Increasing Scientific Standards", *An Assessment of Twentieth-Century Historiography. Professionalism, Methodologies, Writings*, ed. by Rolf Torstendahl (Stockholm: Almqvist & Wiksell, 2000), 137.

[37] Lutz, "Flexible Response?", 138; McCrank, *Historical Information Science: An Emerging Unidiscipline*, 478. Glénisson moreover had close ties to *Annales*-historian Fernand Braudel: Barbiche, "Jean Glénisson (1921-2010)", 621.

[38] Six out of 23 essays in the 'Applications' section of conference report are from medievalists, amongst which is the only historiographical overview of important projects: *History and Computing*, ed. by Peter Denley and Deian Hopkin (Manchester: Manchester University Press, 1987), 1-143. Note moreover that other historical divisions of the C.N.R.S. such as the Institut d'Histoire du Temps Présent and Institut d'Histoire Moderne et Contemporaine only organized a joint congress on 'history and informatics' in March 1980.

II. A Borgesian Dream

The group of medievalists that structurally gathered around the I.R.H.T.-published journal *Le Médiéviste et L'Ordinateur* thus provides an ideal starting point for research into the emotive-epistemological stages computer-using medievalists 'went through' from the 1970s to the early 1990s.[39] The core of this *MO*-group consisted of twenty-six France-based members; among them, eighteen were part of the subsequent editorial committees, and six contributed to more than three issues. It is notable, moreover, that from the start and throughout the entire two decades in question, the editorial committee was numerically dominated by women: in 1979 four out of seven members were women, in 1988 six out of ten, in 1994 the number rose to nine out of twelve. The C.N.R.S. Round-Table conferences on (medieval) history and computing, often organized and always attended by a large share of *MO*-medievalists, likewise enabled me to retrieve the emotional-epistemological language and illustrations used by medievalists. Together, the journal issues and the conference reports form the basis for the discussion below.

When during the first international C.N.R.S. round-table conference in 1975, Giulio Battelli stated that "the new technical computer systems which register whole texts" would satisfy "*every* type of present and future query from researchers", he captured well the epistemological optimism that typifies the earliest decade of medievalists using computers.[40] This trusting epistemic attitude was fostered by a plethora of positive understandings about the nature and usefulness of computer-based results and methods in medieval history, and was expressed frequently during conferences and in journal contributions. Indeed, as shows Battelli's remark, medievalists expected their databases to be useful for and useable by coming generations of medievalists. With the help of computers, scholars would, one day, find out everything the surviving sources allowed them to know about the medieval past.[41]

It is unsurprising, then, that the epistemological 'soundness' of such a result needed to be assessed. Though computer-based research techniques had made the attainment of both qualitative and quantitative results that were previously deemed too complex or time-consuming possible, it was still unclear what the exact status of such a result was. Medievalists themselves admitted that there were serious problems associated to the integration of sources into databases, as even Battelli made the important caveat that specifically for papal registers, there simply were too many sources to be completely registered, but in general they remained overwhelmingly optimistic during the 1970s and early 1980s.

[39] *Le Médiéviste et L'Ordinateur* (Paris: I.R.H.T., 1979), http://lemo.irht.cnrs.fr/archives.htm. I have consulted the first twenty issues on paper, from 1990 on the issues are consultable online (plain text without pagenumbers, unfortunately).

[40] Giulio Battelli, "Una proposta per un indice dei registri pontifici", *Informatique et histoire médiévale. Communications et débats de la Table Ronde CNRS, organisée par l'École française de Rome et l'Institut d'histoire médiévale de l'Université de Pise*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 25.

[41] This sentiment can be found many of the *MO*-contributions, clear examples include: Josette Metman, "Courrier des lecteurs: Un aspect particulier de l'informatique en sciences humaines: La documentation historique'", *MO*, 1 (1979): 17; Monique Paulmier-Foucart and Marie-Christine Duchenne, "La maîtrise d'une oeuvre monumentale: Vincent de Beauvais", *MO*, 13 (1985): 12-15.

The specific idea that computer-based results were epistemologically desirable was sustained by the conviction that computers provided (at least some) solace to the 'subjectivity problem' of the historian. Even though this problem was ultimately deemed unable to be entirely overcome, it needed to be dealt with seriously.[42] The solution someone like Léopold Genicot provided was conceptualized in terms of what the theorist and historian of objectivity Alan Megill named 'procedural objectivity'.[43] With the celebration of the epistemic virtue of 'being rigorous' as the historian's "highest command", and a definition of rigor in terms of procedures (it consisted of constant self-reflexive questioning, doing work meticulously, and the careful consideration of categories), many medievalists believed that the computer, simply by being used, automatically turned them into 'better' scholars.[44] Lucie Fossier, Cinzio Violante and André Vauchez shared this sentiment most explicitly in their introduction to the above-mentioned 1975-conference-report, but they surely were not the only ones who felt that way:[45]

> Anyone who has worked with a machine would recognize that the way this demands concision, and the way in which vagueness is refused, often generates a kind of awkwardness. But at the same time this constitutes the guarantee of absolute rigor and deepened research in the implementation of documentation.[46]

This idea of working with great care and even greater patience – full-text integration could take longer than actually writing a dissertation – found a graphic counterpart in the images used by the journal *Le Médiéviste et L'Ordinateur*. In the first twenty issues (1979-1989), the title page consistently showed a drawing of a medieval

[42] See the discussion of subjectivity by Michel Rouche, "La technique: Encore le problème de la saisie: Pourquoi pas la disquette?", *MO*, 3 (1980): 18. One could argue that, in medieval history today, 'subjectivity' is not automatically seen as a problem anymore: in certain 'epistemic cultures' – to use that term loosely – at least some medievalists appear to celebrate their subjectivity and situatedness, or at least deem it alright to start from that point. A critique hereon by Dipesh Chakrabarty, "Historicism and Its Supplements: A Note on a Predicament Shared by Medieval and Postcolonial Studies", *Medievalisms in the Postcolonial World: The Idea of "the Middle Ages" Outside Europe*, ed. by Kathleen Davis and Nadia Altschul (Baltimore, 2009), 109-119.

[43] Allan Megill, "Introduction: Four Senses of Objectivity", *Rethinking Objectivity*, ed. by Allan Megill (Durham: Duke University Press, 1994), 10-11; Léopold Genicot, "Conclusions", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 425-426.

[44] An example of 'heavy' virtue-language in Lucie Fossier, "Autour de la charte... L'analyse documentaire et le médiéviste", *MO*, 2 (1979): 2-5. Note indeed that the computer is, in some cases, thought of as 'actor'. See especially a piece Robert-Henri Bautier, who reflects extensively on the relation between the historian and the computer, and a kind of division of tasks: Robert-Henri Bautier, "Les demandes des historiens à l'informatique: La forme diplomatique et le contenu juridique des actes", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 181.

[45] See also Jean-Philippe Genet, "Histoire sociale et ordinateur", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 236; Monique Langlois, "Contrôle et enrichissement d'un instrument de travail ancien: Le fichier des noms des parties en procès devant le Parlement de Paris de 1350 à 1363", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 383; Genicot, "Conclusions", 430; Bautier, "Les demandes des historiens à l'informatique", 186.

[46] "Avant-Propos", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 8-9.

monk in a scriptorium working on a computer, instead of with the usual feather and parchment. Underneath this image one reads "D'après B. N. MS. Fr. 8266 fol. 5" (a fifteenth-century compilation of Breton chronicles); a cheeky reference to the Bibliothèque nationale de France catalogue number, in which indeed an almost identical image can be found.[47] With this image, the period in-between the medievalist and his/her object of study was flattened, and this strategy of equating the modern-day medievalist with actual medieval monks suggested not just the care with which these medievalists worked, but also the absolute heuristic suitability of using computers for writing medieval history. Or, as Marie-Thérèse Lorcin so joyfully penned down: it was "as if notarial acts were made for historians working with computers."[48]

Another reason medievalists showed themselves great optimists, was because the computer allowed them to strengthen the traditional method of historical criticism. Especially for large collections of serial sources, authenticity-checks per item were often deemed too time-consuming. Instead of relying on a sampled external critique, computers made it possible to lean on an internal consistency-analysis. Jean Glénisson, for example, saw in the computer such a great detector of anomalies that he considered the traditional conception of *Quellenkritik* in need to be rethought within the framework of a coherence theory of truth.[49] Even Jean-Philippe Genet, who would not go as far as those who claimed that the knowledge produced with computers based on serial sources "was unable to be contested", did expect fraud to diminish, if not to disappear, because follow-up checks became possible.[50] The French information scientist and 'outsider' Yves Chiaramella concluded in 1980 that he found "amongst [French] medievalists more or less the same reactions as with the linguists […]: perplexity and enthusiasm."[51]

III. Hopes at Risk

It should be noted that all the aforementioned optimistic notions – about doing meticulous work, producing falsifiable robust results, and anticipating future inquiries – were intricately entangled and interlocked with one another. Though expressing them in speech and writing proved a useful strategy to propagate and reproduce positive ideas about the use of computers, it put these understandings, and thereby the whole enterprise of using computers, 'at risk'.[52] This entanglement of ideas ex-

[47] See the BnF record online: "Cote: Français 8266, Ancienne Cote: Supplément Français 67, «Compillation Des Cronicques et Ystores Des Bretons, Partie En III Livretz» Par Pierre LE BAUT, Secrétaire de Jean, Sire de Derval", BnF Archives Manuscrits, 2018, http://archivesetmanuscrits.bnf.fr/ark:/12148/cc568375.

[48] Marie-Thérèse Lorcin, "Sources homogènes: Les actes notariés Du Forez et Du Lyonnais", *MO*, 3 (1980): 2.

[49] "When confronted with millions of documents […] we cannot afford to examine the authenticity of each one, as the good historical method has taught us. What we can critique, however, is their coherence in a series: is element B "coherent" with element A that precedes it, and element C that follows?", in "Discussion après les communications sur la prosopographie", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 245-246.

[50] Genet, "Histoire sociale et ordinateur", 236; Rouche, "La technique: Encore le problème de la saisie", 17.

[51] Yves Chiaramella, "Un système: Couplage automatique d'informations floues. Le système Mercure", *MO*, 4 (1980): 14.

[52] On the validation and at-risk-putting of understandings, see Andreas Glaeser, "Hermeneutic Institutionalism: Towards a New Synthesis", *Qualitative Sociology*, 37 (2014): 207-241.

plains why anxieties over the limits to the usefulness of computer-based technologies were expressed clearly, lucidly, and loudly: in order to guarantee some of the core convictions to persist, methodologies had to be optimized and problems had to be solved. Indeed, the simple fact that empty nodes could, in the earliest attempts at database-formation, not be filled in, put at risk the entire "Borgesian dream" as described above.[53] With ambiguities about dates or names unable to be signaled, the level of certainty attached to specific results could not be indicated either.

These empty nodes proved only the beginning of the medievalist's daily battle with the limitations of early computer-software, memory, and speed. Undeniably, processing sources into databases was a challenging task, as the

> establishment of programs […] often hurts itself to the difficulty of reconciling the computer's systematic rigor with the incoherency of the source, which only allows partial formalization and automatization.[54]

Medieval spelling, moreover, was not standardized, which caused great frustrations.[55] One way medievalists tried to deal with this was by coupling methodological reflection to specific source-types, and so specific journal issues on serial sources (*MO* issues 3 and 4), on cadasters (issue 8), on testaments (issue 11), and on images (issue 26-27) were published to help those colleagues working with similar materials.[56] When problems needed to be resolved on the spot, some medievalists simply left those parts of their data on which not enough was known out of the database – "without any remorse", so writes Hélène Millet in 1982, because "even classification would not learn me anything about it anyway!"[57]

Millet's own work, based on the "automatic classification" (in a hierarchical database) of Laonnois 13th century canons, shows that the results of such an incomplete database could still be useful.[58] Yet in an exceptionally honest report, she warns the reader: it was not easy to arrive at suitability. Her classification-exercise rolled out of the printer in a graph up to four and a half meters long, without the numbers she used to classify her data, and her initial reaction was one of "enormous discouragement". To arrive at an

[53] It is, for example, impossible to use descriptors of places and names in diplomatic sources that are the same for the 9th and the 15th century, which makes long-term analysis difficult, see Lucie Fossier and Caroline Bourlet, "Problèmes d'utilisation d'un lexique pour le traitement des actes diplomatiques", *MO*, 6 (1981): 11.

[54] Hans-Martin Bächler and Urs Portmann, "Un example opérationnel: Le premier livre des bourgeois de Fribourg (1341-2426)", *MO*, 4 (1980): 11. On the difficulty of working with a factorial analysis, see Alain Guerreau, "Le Haut Moyen Âge factoralisé", *MO*, 5 (1981): 9, 11. For cluster analysis and the difficulty of choosing a database structure see Patricia Galloway, "Filiation, classement, cluster analysis: Lai de l'ombre", *MO*, 7 (1982): 10-14.

[55] Specifically on language: Felicien De Tollenaere, "Les chartes néerlandaises en langue vulgaire", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 105-106. About dates and places: Bautier, "Les demandes des historiens à l'informatique", 186-187.

[56] These are issues from the years 1980 (3 and 4), 1982 (issue 8), 1984 (issue 11), and 1992-1993 (issue 26-27). This solution is also called the source-oriented approach for the creation of databases, contrary to e.g. document-oriented, data-oriented, and topic-oriented approaches; Toine Schrijvenaars, "Computerized Prosopographical Research", *Prosopography and Computer*, ed. by Koen Goudriaan et al. (Leuven: Garant, 1995), 8-10.

[57] Hélène Millet, "Une expérience: Essai de classification des chanoines de Laon", *MO*, 7 (1982): 15.

[58] The results of which were discussed more extensively in Hélène Millet, "La composition du chapitre cathédral de Laon: Une analyse factorielle", *Annales ESC*, 36 (1981): 117-138.

insightful graph, which consisted of the fifty highest nodes of her groupings, she had to recouple the data, a total of 688 units, up to 687 times. The result is, without a deep knowledge of the ecclesiastical history of Laon, impossible to interpret.[59]

That those databases without full-text integration were manageable only by the medievalists who designed them caused great unease.[60] Though most medievalists had accepted that the construction of databases took long, intense, and expensive labor, younger voices in the community took more liberty to complain about these issues. Doctoral students often saw their years of database-construction neglected after finishing a thesis, and the French Monique Zerner openly stated that her "mass of data" was interesting to her, and to her only.[61] Technology moreover changed so quickly that certain database management system programs quickly became outdated, and it is likely that some doctoral candidates must, at times, have felt like they were building databases for the sake of building them. Glénisson, who was older and, as director of the I.R.H.T., responsible for the wise spending of resources, openly admitted that many of these databases were in fact "second order archives", but stubbornly maintained that one day, they would be integrated with the help of new software and eventually part of a "general database."[62]

Anxieties of registering the same sources twice likewise loomed large. In 1980, Jean-Philippe Genet, who was at the time "maître des conférences" at Paris I, travelled to the United Kingdom not just to see what "machines" medievalists used there, but also to get an idea of the texts that had been (and were being) processed.[63] He concluded: "before undertaking the preparation of a text in inserting in a machine, a letter to Oxford (Lou Burnard) or Cambridge might be useful."[64] A similar sentiment, and the true collaborative spirit that came with it, was shown by the American George Beech, who took the effort to write a short reaction to Josette Metman's piece in *MO*'s second issue, exhorting her not to start from scratch, since specifically for research on Cluny "J. Wollasch at Minster told me in June 1978 that his assistants had already completed such an index of personal names […] it would be a shame to duplicate such work which must have taken an enormous amount of time."[65]

[59] Difficulties of interpretation were also discussed in regard to other computer-based methods, for example the analysis of correspondances: Philippe Cibois, "L'utilisation de l'analyse des correspondances", *MO*, 5 (1981): 17.

[60] The question of whether to choose for 'open' of 'closed' research that had been so important in 1975, remained unanswered, and on a Round-Table conference in 1978 it was concluded that choices between open and closed research would have to be made on a case-by-case basis. See: Karl Ferdinand Werner, "Remarques préliminaires", *L'Histoire médiévale et les ordinateurs*, ed. by Karl Ferdinand Werner (Munich: Institut Historique Allemand, 1981), 11.

[61] Lucie Fossier, André Vauchez, and Cinzio Violante, "Discussion après la communication de Mme Zerner", *Informatique et histoire médiévale*, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 165.

[62] Jean Glénisson, "Prosopographie et informatique", *Informatique et histoire médiévale*, ed. by Lucie Fossier, André Vauchez, and Cinzio Violante, Collection de l'École Française de Rome 31 (Rome: École française de Rome, 1977), 228-229.

[63] Biography of Genet in Aude Mairey, Solal Abélès, and Fanny Madeline, "Introduction", *Contrechamps. Études offertes à Jean-Philippe Genet*, ed. by Aude Mairey, Solal Abélès, and Fanny Madeline, Polen - Pouvoirs, lettres, normes 4 (Paris: Classiques Garnier, 2016), 12-14.

[64] Jean-Philippe Genet, "Voyage Outre-Manche: Les centres d'Oxford et de Cambridge", *MO*, 4 (1980): 14-16.

[65] George T. Beech, "Courrier des lecteurs: Les chartes de Cluny", *MO*, 3 (1980): 19.

Because of these combined problems, medievalists met explicitly with the goal of establishing who was doing what, where, and how, from the early 1970s on. After having sent out an international questionnaire in 1976, and having gathered on a second international conference in 1978 in Paris, Karl Ferdinand Werner (director of the Institut historique allemand de Paris) as quickly as possible edited a 126-page bibliographic overview of projects underway. In doing so, he prioritized 'the practical' and neglected the methodological-philosophical discussions that had likewise taken place in Paris that year.[66] In 1980, the editorial board of *Le Médiéviste et L'Ordinateur* moreover came to an agreement with the Institut d'Études médiévales de Montréal: the Canadians would manage the indexation of projects for North America, Paris would do so for Europe.[67] Thus, an international division of labor was institutionalized, projects were being classified, and French C.N.R.S. medievalists ever more strongly became the computer's prime defendants.

IV. Standardizing Attempts

The international questionnaires and overview publications continued to be made up after 1980; however, these organizational strategies did not prevent a feeling of being overwhelmed to creep up on the French I.R.H.T.-medievalists.[68] Databases made on 'heavy computers' could not easily be shared with scholars using microcomputers, and the choice for a specific program often led to similar consequences.[69] Moreover, as the code used by an individual scholar was often highly specific, or just sloppy, it would be unclear what sources exactly conformed to a single type, and where boundaries between the in- and exclusion of sources in the database had been drawn. All of this made that in 1987, medievalist Jean-Philippe Genet dramatically spoke of the shared "Borgesian dream" at the edge of turning into a true nightmare.[70]

From the mid-1980s, medievalists sought solace to this epistemic experience of chaos not merely in the indexation of projects and classification of source-types, but also, and increasingly so, in optimizing program compatibility through coding language standardization. French-German collaboration at Max Planck in Göttingen

[66] *L'Histoire médiévale et les ordinateurs. Medieval History and Computers. Rapports d'une Table Ronde Internationale Paris 1978*, ed. by Karl Ferdinand Werner (Munich: Institut Historique Allemand, 1981).

[67] Serge Lusignan, "CAMDAP-INFEM", *MO*, 3 (1980): 18. Indeed North American medievalists experienced the same fears: "evidently, too many projects in all fields of humanistic research seemingly pass through the "brain of the computer" without ever engaging the brain of the scholar. Medievalists have to take care that they are not doing the same thing": Bullough, Lusignan, and Ohlgren, "Report: Computers and the Medievalist", 402.

[68] See the questionnaire added to the twentieth *MO* issue: "Questionnaire (à renvoyer au plus tard le 30 mars)."

[69] In issue 21, three different articles address issues about sharing: Monique Bourin, "Les avatars d'une base de données: L'exemple du minutier de Touraine (1980-1990)", *MO*, 21 (1990): http://lemo.irht.cnrs.fr/21/mo2102.htm; Michelle Magdelaine, Arlette Faugères, and Agnès Guillaumont, "La banque de données sur le refuge huguenot", *MO*, 21 (1990): http://lemo.irht.cnrs.fr/21/mo2103.htm; Thérèse Montecchi Palazzi, "L'informatisation des archives de l'Opéra del Duomo à Orvieto", *MO*, 21 (1990): http://lemo.irht.cnrs.fr/21/mo2104.htm.

[70] Genet, "Introduction", 1988, 15. Another phrase that captures this feeling well: "whoever speaks about the structuration of information, of data, also speaks of software, and problems": Caroline Bourlet, Françoise Delaveau, and Agnès Guillaumont, "Éditorial", *MO*, 23 (1991): http://lemo.irht.cnrs.fr/23/mo2301.htm.

(co-sponsored by the C.N.R.S. Institut de Recherche Historique par l'Informatique et la Statistique) for example resulted in the history-software package CLIO being developed into CLIO-C – so the program would be usable 'in C' on mainframes and on micro-computers. In the wake of this development, Frédéric Rousseau called the effort "a smart marriage", and claimed "further standardization and collaboration would arise."[71] With the creation of the Association for History and Computing, and the close collaboration between Jean-Philippe Genet and Manfred Thaller, Max Planck-scholar, and CLIO-developer, European cooperation indeed would go hand in hand with attempts at database standardization.[72]

Thaller's pursuits at standardization for database research in the historical discipline are worth a closer look, even though he was never directly part of the *Le Médiéviste et L'Ordinateur* network. But with his attempts at software-development from 1980 on, and as president of the International Association for History and Computing between 1992-1994, he became the most famous information scientist to have worked on standardization and software development for historians. Moreover, because Thaller reflected extensively and openly on his own past ambitions and projects, taking a closer look at his career in relation to the French I.R.H.T.-subfield helped me tremendously to reconstruct the way medievalists dealt with database-chaos.[73]

In 1991, Thaller mocked the fact that 1950s-projects that had aimed to "make available a huge corpus of historical material of central importance to the discipline" were in 1990 never looked at. Besides, he noted, the "unnecessarily expensive and somewhat irrational behavior [of historians constantly developing their own code] has not gone unnoticed […] by agents of funding bodies."[74] Thus he set his own goals: to "allow the historian well versed in one usage [of code] to drift painlessly into another without losing the data already entered and without having to relearn absolutely everything."[75]

As a self-nominated savior, Thaller for example headed an international workshop on standardization at the Karl-Franzens Universität in Graz in 1986.[76] During this meeting, three different "levels" on which action was necessary to tackle historians' inefficient use of computers were identified. First, so reported Jean-Philippe Genet in the 16b-issue of *MO*, Thaller proposed a *preventive* solution, which consisted of the elaboration of 'prototypes'.[77] Historians, for example, should be warned against using certain encodings and structures that pose problems for further research. They could also be offered pre-made standards for "those sources most often registered (parochial registers, censuses, and lists of all forms)." Second, on the *informative* level, Thaller proposed to

[71] Frédéric Rousseau, "Courrier des lecteurs: Un beau projet: CLIO à la portée de tous", *MO*, 15 (1986): 18-19.

[72] Genet, "Introduction", 1988, 21.

[73] Manfred Thaller, "The Need for Standards: Data Modeling and Exchange (1991)", *Historical Social Research Supplement*, 17 (2017): 205. On his election as president: Thaller, "Between the Chairs", 31.

[74] Thaller, "The Need for Standards", 204. That resources were scarce, shows for example Yves Chiaramella's report on the MERCURE system: Chiaramella, "Un système: Couplage automatique", 14.

[75] Thaller, "The Need for Standards", 220.

[76] The results were published the same year: Manfred Thaller, "A Draft Proposal for a Standard for the Coding of Machine Readable Sources", *Historical Social Research/Historische Sozialforschung*, 40 (1986): 3-46.

[77] Jean-Philippe Genet, "Colloques passés: «International Workshop on Standardization», Graz, 30 mai-1 juin 1986", *MO*, 16b (1987): 43.

develop a precise description protocol of the sources incorporated in a database […], in addition to providing minimal indications of the informational characteristics of the database (machine(s) installation, language and type of program, references to potential documentation, memory requirement).

Third, on the *purely computer science* level, it would be necessary to develop two informational packages for historians: one on registering sources (a codebook), and one on the limitations of using software packages, such as SPSS, CLIO, OSIRIS, PROSOP, etc.[78]

Though these ideas were received with strong skepticism by some of the medievalists involved, who insisted that the practice of writing history was hyper-individual and standardization should not be pushed any further than the make-up of a codebook, funding organizations such as the European Science Foundation (ESF), and in 1988 even Volkswagen, saw great promise in Thaller's proposal(s).[79] Medievalists went along, as long as the goal was to have the standardization work up to the level of the exchange and addition of databases – nothing more, nothing less.[80] A call for collaboration by Jean-Michel Poisson makes this need concrete: in 1988, he asked the *MO*-readers for tips on how to integrate two prosopographical databases on Pisans (his own on Pisans in Sardinia and Catherin Otten's on Pisans living in 'the Orient').[81] Hoping to later integrate existing databases of Pisans in the Maghreb and in Sicily, it becomes clear that with the possibility of adding databases, the French imagination of synthesizing medieval history on the basis of exhaustive databases quickly took the form of an international project.[82]

With support of the ESF, the next "International Workshop on Standardization and Exchange of Machine Readable Data in the Historical Disciplines" took place a year later, not in Germany, but in France. Here, Thaller proposed the brand new standard format exchange program StanFEP, which would function as preamble for the entering of data into databases, and which would facilitate interpretative work.[83] Amongst medievalists, the reactions now seem to have been lukewarm.[84] Caroline Bourlet and Hélène Millet wrote in their report that though Thaller's plans to make

[78] Note that those information packages would come in two forms: an easy one, for historians not so well-versed in computer science, and a more elaborate one: Genet, "Colloques passés", 44.

[79] On funding organizations: Genet, "Colloques passés", 43-44; Thaller, "The Need for Standards", 27. For medievalists that insisted on the individual character of research, see Elisabeth Mornet, "Colloques: 'Standardisation et échange des bases de données historiques'", *MO*, 20 (1989-1988): 4; Ingo H. Kropac, "Gain et perte d'information. Problèmes fondamentaux posés par l'édition informatisée des données historiques", *Standardisation et échange des bases de données historiques*, ed. by Jean-Philippe Genet (Paris: C.N.R.S., 1988), 57.

[80] Genet, "Introduction", 1988, 17-18.

[81] Jean-Michel Poisson, "Courrier aux lecteurs: Traitement de données prosopographiques", *MO*, 19b (1988): 34.

[82] See for another example the database integration project HISPABIB, which was sponsored by the European Science Foundation: Caroline Bourlet, "Chronique 'Banque de données operationelle'", *MO*, 19b (1988): 27-28.

[83] Manfred Thaller, "A Draft Proposal for a Standard Format Exchange Program", *Standardisation et échange*, ed. by Jean-Philippe Genet (Paris: C.N.R.S., 1988), 330-331.

[84] When Thaller was invited to write an academic autobiography in 2017, he also recalled that "he frequently had the feeling that there was a tendency to ignore the huge epistemic potential of a serious attempt to apply computer science to the field of history in favor of glamorous but shallow short term goals": Thaller, "Between the Chairs", 7.

databases linkable were "desirable", they were "probably utopian".[85] Since nationally contained attempts at database integration for historical research had already proven quite successful – as showed the examples of the Danish Data Archives and the Zentrum für Historische Sozialforschung – only the idea of making a standardized codebook really resonated.[86]

Indeed, the effects of the 'standardization-craze' of the late 1980s amongst computer-using medievalists, and historians more broadly, seem (at least at the I.R.H.T. in France) not as long-lived as one might expect from the many conferences and workshops that were organized between ca. 1986-1991.[87] Looking back at the development of *kleio*, a software package for historians that attracted quite some users between 1988-1991, but ultimately did not make a big impact, Thaller remembers that for most of the historians he communicated with 'history and computing' remained a craft, not a science.[88] Historians appreciated the use of computers as *Hilfeswissenschaft*; the instruments simply needed to fulfill needs.[89] Though some medievalists may still have chased after the idea of a computer-based 'library of Babel', much like Borges's infinite universe of hexagonal galleries filled with books, in which the "total" knowledge of the universe is stored, many did not.[90] One thing was certain: medievalists did not want to see themselves as the "technical slaves" of their own projects, but as critical thinkers.[91] Jacques Lautman, the director of the Département des Sciences de l'Homme et de la Société of the C.N.R.S., moreover made clear that funding organizations were not too eager to sponsor the maintenance costs of large (meta-)databases consultable at all times either, as he emphasized "colossal disproportion between the investment sums and the actual numbers of consultation."[92]

More research would be needed to reveal how and to what extent the despair attached to the anarchy of software, database structures, and coding languages dissipated after 1990-1992. A first glance at later *MO* issues (up to 2004), and at the conference reports from the Association for History and Computing, suggests that various technological advances made medievalists regain confidence in sharing data and strengthening the durability of their work.[93] Macintosh-PC incompatibility, long a

[85] Caroline Bourlet and Hélène Millet, "Les rencontres: 15-16 mai, Paris, L.I.S.H.: Standardisation et échange des bases de données historiques", *MO*, 17 (1987): 17.

[86] Thaller indeed developed such a codebook, which was integrated in the *kleio* project, but it is unclear to what extent this codebook actually made an impact, and to what extent historians now use the same code. *Kleio*, Thaller admitted, did not have a glorious future: Thaller, "Between the Chairs", 30. See also footnote 88.

[87] The case would be different for the group around Peter Denley at Queen Mary and Westfield in London, which became a sponsor for the English version of *kleio*: Thaller, "Between the Chairs", 36-37, 40.

[88] Manfred Thaller, *KLEIO, A Data Base System for Historical Research, Version 1.1.11* (Göttingen: Max Planck Institut, 1987). On *kleio's* lack of success because of its hierarchical database structure: Schrijvenaars, "Computerized Prosopographical Research", 2. Other reasons this software failed to make an impact is because, as a Volkswagen "special project", the funding could not be continued: Thaller, "Between the Chairs", 37. With open software available today, medieval historian Jean-Philippe Genet also claimed that "the idea of an one-in-all simply does not make any sense": Genet, "Introduction", 2011, 7.

[89] Thaller, "Between the Chairs", 30.

[90] Borges, "The Library of Babel", 115.

[91] Expression "data slaves" from Thaller, "Between the Chairs", 20.

[92] Hélène Millet and Monique Paulmier-Foucart, "Interview de Monsieur Jacques Lautman, Directeur du Département des Sciences de l'Homme et de la Société au CNRS, le 17 septembre 1990", *MO*, 22 (1990): http://lemo.irht.cnrs.fr/22/mo2208.htm.

[93] See the editorial of an *MO* issue entirely devoted to compatibility: Élisabeth Lalou, "Éditorial", *MO*, 24 (1991): http://lemo.irht.cnrs.fr/24/mo2401.htm.

cause for great frustration, became easier to solve, and with the growing popularity (and cheapening) of CD-ROMs, databases could be distributed via discs – first "on site", and later within monographs.[94] Of course, CD-roms also made of databases "libraries without walls", and using these lawfully included respecting contracts regarding both access and (increasingly insisted upon) authorship.[95] But to many medievalists this new ability to share data via CD-roms seemed to suffice, however difficult intellectual copyright barriers may have been to overcome.

After 1990-1992, choosing for certain software and/or material was also done with the very pragmatic realization that soon, that choice would be outdated anyway.[96] A practical attitude can again be found in later *MO* issues, with medievalists set on sharing tips, bibliographic lists of available resources, and even juridical advice on intellectual property.[97] This newfound organizational spirit, together with the possibilities opened up by the introduction of the "world wide web", even led Marie Anne Polo de Beaulieu to write that, with greater deliberation and better material conditions, some of the "naïve hope of gaining time thanks to computers" could in fact become reality.[98] In 1994, a conference on how to achieve a "consensus ex machina" was organized by the AHC.[99] Hence, it appears like the social and epistemic consequences of technical developments in the early 1990s re-set the foundation on which new scholarly longings could grow. Exploring those hopes and ambitions, however, is a subject that deserves independent treatment.

V. Conclusion

Between 1970 and 1995, the group of French medievalists that assembled around the journal *Le Médiéviste et L'Ordinateur* was impacted vastly by the increasing popularity and use of mainframe, and later, micro-computers. While these medievalists experienced the effects of new computer science developments on their craft, three overlapping emotive-epistemological stages in the history of medieval history and computing arose. The 1970s dream of producing falsifiable, ultra-reliable, and extensive knowledge about the medieval past by means of computer-technology was affected heavily by rising uneasiness about the compatibility, re-usability, and organization of data storage during the mid-1980s. With attempts at organizing and standardizing the field, the later 1980s and early 1990s saw the regaining of some of the initial methodological hope to gain time thanks to computer-analysis. On the epistemological level,

[94] See the very optimistic *MO* issue 28 (Autumn 1993) devoted to CD-ROMs.

[95] Sandra de Faultier-Travers, "CD-ROM et droit d'auteur", *MO*, 28 (1993): http://lemo.irht.cnrs.fr/28/mo2812.htm; René Pellen, "Problèmes juridiques: Propriété intellectuelle et société de l'information", *MO*, 38 (1999): http://lemo.irht.cnrs.fr/38/mo3814.htm.

[96] See the editorials of the *MO* issues 24-32, in which the fact that things change quickly is addressed repeatedly. In the 24th issue, Élisabeth Lalou even claimed that the "issue itself will soon be historical artifact": Lalou, "Éditorial".

[97] René Pellen, "Les CD-ROM pour médiévistes: Premiers éléments d'une discographie", *MO*, 28 (1993): http://lemo.irht.cnrs.fr/28/mo2806.htm.

[98] Marie Anne Polo de Beaulieu, "Colloques passés: Colloque international 'CONSENSUS EX MACHINA', tenu à Paris du 19 au 23 avril 1994", *MO*, 29 (1994): http://lemo.irht.cnrs.fr/29/mo2920.htm. See also the very optimistic 30th *MO* issue "les réseaux" in 1994 (Fall).

[99] No conference report seems to have appeared, but another reference to this conference in: McCrank, *Historical Information Science*, 115.

grand-scale attempts at standardization in this 'third stage' likewise (re-)assumed the desirability of mega-databases that had been essential two decades earlier. Thereby, an amended dream of totality was re-launched – the endurance of which remains a subject for future analysis.

My exploration of the early stages of the use of computers in postwar French historiography reveals that the introduction of computers in medieval history affected at least four dimensions of the medievalist's craft. (i) The *physically lived research practice* of medievalists changed, as they often spent long hours inserting data, materially encountered new instruments, and in the 1990s worked with archival sources on CD-ROMs and screens instead of with paper. But using computers also affected (ii) *medievalists' sense of scholarly self*. With computer-usage, medievalists first started to imagine themselves as modern monks who work rigorously and with admirable patience. In second instance, increasingly after ca. 1985, medievalists also self-identified in opposition to computer scientists as question-driven creative thinkers. The use of computers in medieval history research also (iii) provoked a shift in *epistemological concerns*: e.g. in the late nineteen-seventies and early nineteen-eighties the epistemic status of the computerized results medievalists published was re-evaluated, and the type of historical criticism medievalists sought to pursue was (re)defined within the framework of a coherence theory of truth. Lastly, computer-usage contributed to (iv) *the development of new social networks*, as show the groups of medievalists that gathered around the French I.R.H.T. or the International Association for History and Computing.

Together, these material, epistemic, and social shifts reveal the close relation between (partly) routinized scholarly practices and key understandings about what exactly the métier of writing medieval history is about. In this sense, this case study confirms the insight of historians of history and science such as Jo Tollebeek, Marek Tamm, or Lorraine Daston; namely that scholarly practices can be as constitutive of the historically specific understanding of what defines a scholarly discipline, as those understandings can be constitutive of scholarly practices.[100] In light of my analysis of the introduction of computers in medieval history between 1975 and 1990, the attribution of at least a limited kind of agency to instruments in both theoretical and historiographical reflection on history thus appears necessary.

To probe what such an 'object-oriented' theoretical-historiographical approach can contribute to the theory of history, the question of how instruments influence dynamics of change within the historical discipline provides a useful starting point. Though I am by no means the first historian to use the concept of a 'paradigm' in regard to computers, actual theoretical and historiographical re-considerations of the Kuhnian notion have not incorporated these instruments as such.[101] Rolf Torstendahl's account of how after the Second World War the dominant paradigm, which

[100] Jo Tollebeek, *Fredericq & Zonen. Een antropologie van de moderne geschiedwetenschap* (Amsterdam: Bert Bakker, 2008); Tamm, "Truth, Objectivity and Evidence in History Writing"; Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007).

[101] Uses of the word "paradigm" with relation to computer-usage in historical research: McCrank, *Historical Information Science*, 24; Tollebeek and Porciani, "Historians and the Web", 421; Beatriz Inés Moreyra, "History: Mutations, Crisis, and Disciplinary Identity", *An Assessment of Twentieth-Century Historiography*, ed. by Rolf Torstendahl (Stockholm: Almqvist & Wiksell, 2000), 197.

he defines as an equilibrium between optimum norms and minimum demands, shifted to norms (i.e. the topics and types of results valued highly within the discipline) dominating demands (i.e. methodological concerns), for example does not mention computers.[102] His exploration of the same topic in terms of Peter Lipton's 'lovely' explanations dominating 'likely' hypotheses in a previous issue of this journal likewise ignores the computer's potential to produce new kinds of 'loveliness'.[103] Yet incorporating this new and evolving technology in Torstendahl's story on questions taking over methods as defining the historical profession at least conceptually proves the need for including instruments in theoretical analyses of history.

Indeed, even if one does not accept Torstendahl's redefinition of a paradigm within the historical profession, or dismisses his arguments about "what the revolution of historiography was about", computers remain crucial in his assumed theory of gradual change. If gradual change of the historical profession is caused by changes both in norms and methods, contrasted to paradigmatic changes as one taking preeminence of the other, computers still survive at the core of both defining aspects. As the early computer-using medievalists noticed all too well, computers have the capacity to radically alter the time-economy of attaining certain results, and therefore can open up the possibility of certain norms to exist in the first place. Thus instruments prove themselves instrumental in studying the dynamics of conceptual and disciplinary change. Additionally, the enthusiasm of medievalists using computers in the 1970s and early 1980s, and the re-found hope of the later 1990s, reveals the exceptional promise medievalists *imagined* this instrument to have. Though bibliometrical research would have to reveal the extent to which computer-use actually contributed to the publishing of influential and impactful results, taking these hopes seriously is crucial if one wishes to grasp field-dynamics that participants often (partially, 'intuitively') understand, yet do not write down. To study how the historical profession changes, then, is also to study what historians use.

[102] Torstendahl, *The Rise and Propagation of Historical Professionalism*, 214.

[103] Torstendahl, "Explaining Evidence and the Revolution of Historiography from the Nineteen-Sixties to Nineteen-Ninety." Though Torstendahl does not explicitly mention Kuhn in this piece, he does speak of a "revolution of historiography".

Appendix: Images

Image 1. "Le Médiéviste et L'Ordinateur Logo."
In *Le Médiéviste et L'Ordinateur*, 1 (1979): 1. Anonymous. Paris: C.N.R.S.

IMAGE 2. "Enluminure from Compillation des Cronicques et ystores des Bretons, partie en III livretz", 15th century.
In *Bibliothèque nationale de France Archives Web - B.n.F. MS. 6288 fol. 5.*
Accessed October 26, 2018.
https://archivesetmanuscrits.bnf.fr/ark:/12148/cc568375.

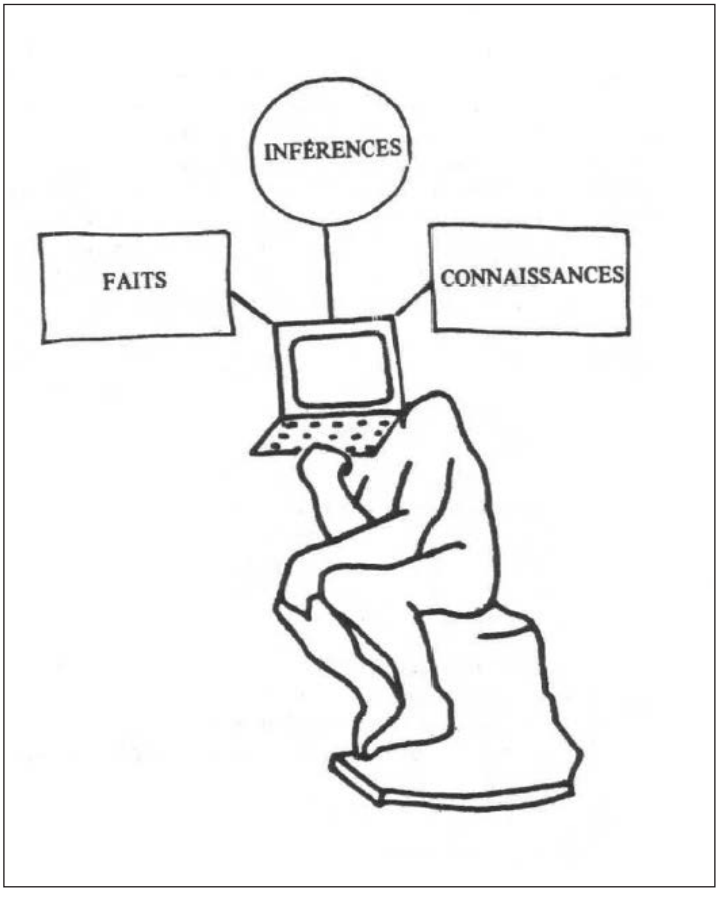

Image 3. "Rodin: Penseur/Ordinateur."
In *Le Médiéviste et L'Ordinateur*, 15 (1986): back cover. Anonymous. Paris: C.N.R.S.