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Apprenticeship in the Renaissance University: Student Authorship and Craft Knowledge¹

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Argument: Students entered Renaissance universities as apprentices in the craft of books. In the decades around 1500, such university training began to involve not only manuscript circulation, but also the production and the use of books in the new medium of print. Through their role in the crafting of books, I show how a circle of students around Jacques Lefèvre d'Étaples gained the experience needed to become bookmen. Students took classroom manuscripts and brought them into print—the new print shop offered students a place in which to exchange labour for credibility as joint authors.

1. INTRODUCTION

As a learner, the premodern university student shared much with his artisan counterpart. Both youths joined corporations that originated in urban growth from the eleventh century onward, corporations in which “masters” certified and monopolised the flow of products and skills between cities.² In fact, medieval jurists used the word *universitas* to name every sort of corporations, including early trade guilds as well the students or masters who comprised the early universities.³

On joining a university or guild, a youth left home and entered a new—largely homosocial—family, in which the master passed on skills and knowledge and also took on moral oversight of the youth *in loco parentis*, very often housing and feeding his charges. On joining the corporation and attaining status within it, both students and apprentices navigated a documentary culture of certification. A youth might find preliminary training in the craft, whether brickmaking or copying books, enough to secure an opportunity and so leave his training early. Many youths never sought certification (Wallis 2008, Kintzinger 2000, Schwinges 1992). A significant number, however, did. An ambitious youth might pursue his master's vocation for himself, completing his years of apprenticeship or studies to gain the certification of journeyman or bachelor, and eventually attain the title of master, which in turn allowed him to train others. Such a youth engaged an economy of fees, gifts, ceremonial processions, and feasts designed to structure and regulate the hierarchies of the corporation, hierarchies that proliferated throughout the early modern period. The Enlightenment cameralist Johann Justi highlighted the shared frustrations of

¹ Thanks are due to Feike Dietz, Els Stronk, and Sven Dupré for their thoughtful leadership in the workshops and editorial process leading to this special issue, as well as to the participants of those workshops for their fruitful conversation. I am also grateful to the anonymous peer reviewers for their careful reading and several suggestions. The research leading to this paper has received funding from the European Research Council under the European Union's Seventh Framework Programme (FP7/2007-2013)/ERC grant agreement no 617391. This paper develops arguments opened up in Oosterhoff 2018.

² Recent bibliography on the emergence of guild regulation and hierarchies is available in Lucassen et al. 2008, Anheim 2013. On the emergence of universities as corporations, see Post 1934, and more generally Ferruolo 1985, Verger 1991; and for mobility of qualifications, see Courtenay 1988.

³ Michaud-Quantin 1970, cit. Verger 1991, 37.

premodern guild and university: “Mastership too often comes from connections, and is given on the basis of ‘sumptuous masterpieces, never useful for normal life, and not at all given in view of diligence and true talent’” (von Justi 1755, quoted by Clark 2006, 12).

The analogy of guild and university went even deeper. The material and conceptual realities of university life were often framed as the tools and products of craft or *ars*, a terminology that early modern universities inherited from their medieval forebears. The world was a giant workshop, suggested the medieval master Gerhoch of Reicherberg, and William of Conches added that “all work is the work of the creator, the work of nature, or of man-the-artisan imitating nature” (cit. Le Goff 1993, 57). Developing this account of mankind as irreducibly artisans, Hugh of St Victor emphasised that the *artes* are not sciences but techniques, since that is “called art which takes shape in some material medium and is brought out in it through manipulation of that material, as is the case in architecture”; Hugh therefore became the first to cast the mechanical arts as companions of the liberal arts (Hugh of St. Victor 1961, 62).⁴ Mary Carruthers has shown how deeply craft metaphors of habit and gesture permeated medieval understanding of intellectual work (Carruthers 1998). Jacques Le Goff and William Clark have suggested that premodern academic authority was vested in material objects and processes of making: books were not simply abstract vectors of ideas, but explicitly described as the tools and the products of intellectual commerce (Le Goff 1993; Clark 2006). Early modern university students and masters, I will show below, explicitly adapted such Victorine categories to explain their own intellectual work.

Participation in book culture—whether production or use—has often justified the distinction of elites from the rest in the imaginations of social and cultural historians. Over the last thirty years, that distinction has worn thin. In the history of science and technology figures such as Robert Boyle turn out to have relied on entire households of “invisible technicians” who contributed both labour and knowledge to his science (Shapin 1989). We have learned from Carolyn Merchant’s insight that women and artisans contributed meaningfully to the new knowledge economy of the seventeenth century.⁵ Recently book historians have taken the problem on more directly, focusing on the practices of collaborative authorship. Even the best-selling author of early modern Europe, Desiderius Erasmus himself, depended on a community to produce physical objects that could project his persona.⁶ This case holds more generally. The often hidden collectors, collators, amanuenses and other assistants played a more creative role in early modern authorship than we used to think (Grafton 2011, Blair 2017a). Grand personalities such as Erasmus and the quixotic encyclopedias of Conrad Gesner turn out not to be the artworks of singular geniuses, but rather the ingenious artefacts of entire communities. Even the apparently standardised and replicable knowledge that Elizabeth Eisenstein saw in printed books,

⁴ In this account, Hugh drew on Chalcidius’ commentary on the *Timaeus*, where God is artificer (e.g. Hugh of St. Victor 1961, 55). On Hugh’s place in various categorizations of the arts, see Whitney 1990, 82-99.

⁵ The literature is now vast (e.g. Leong and Rankin 2011, Dupré 2014) but early examples are Merchant 1980, Smith 2000.

⁶ See the marvelous study of Vanautgaerden 2012. Erasmus’ tense relationships with his printers have long been known: Allen 1913. Vanautgaerden, however, confirms that Erasmus adopted an authorial personality that both invoked and effaced his many amanuenses, correctors, and printers: see also Jardine 1993, 99–121.

was in fact a socially produced object, requiring continual negotiation to be experienced as standardized, as we learned from Roger Chartier and Adrian Johns (Eisenstein 1979, Chartier 1994; Johns 1998). Context makes science, and it takes a community to make a book.

Through the case examined here, my goal is to extend this logic from the exceptions—Boyle, Erasmus, and so on—to the standard structure of school learning in the earliest period of print. In the scholarship of the previous paragraph, mainstream compendia still take second place to exceptional works of science, literature, and art.⁷ While we may find that identifying a textbook is harder than it seems (as Grafton 2008 points out, what is *not* a textbook?) it is nevertheless clear that, if we care about the social history of knowledge, we should attend more to textbooks, the objects that mapped the cultural assumptions and cognitive practices of the period.⁸ Furthermore, by considering these texts materially—as objects produced within a particular community and place—similarities emerge between university and workshop. Against the historiographic tendency to seal off “high” from “low” culture, I will focus on what they shared, arguing that artisans and scholars shared a basic educational cycle orientated around the crafting of objects.

The case that I present here comprises a group of men often identified with the early French Renaissance. Rather than viewing them as humanists, a historiographically fraught term associated with abstract ideals, I first present their careers as bookmen, involved in the production and use of particular objects. Then I examine two moments of student engagement in book production, one in manuscript circulation within the classroom and another in the print shop. In a final section, I suggest that these craft practices could be dignified as knowledgeable within the orthodox frame of university thought.

2. APPRENTICE BOOKMEN

From the perspective of the material book, Jacques Lefèvre d'Étaples (c. 1450-1536) became influential not by publishing deluxe objects of erudition like his admired friends Ficino, Barbaro or Poliziano, but by producing short handbooks to the university arts.⁹ After retiring from university teaching in 1508, he became known for innovative editions of and commentaries on Church Fathers and the Bible. But first, during his tenure as a regent master in Paris, Lefèvre expended his energies on producing a wide range of accessible introductions to university arts, from logic and mathematics to natural philosophy and moral philosophy (Trithemius 1512, 215v–216v). As I shall argue below, these books also bear the thumbprints of a close circle

⁷ The chief exception is commonplace books, which *have* been deeply mined for the textual and cognitive practices of commonplacing, as school boys were taught to read with pen in hand, acquiring habits that allowed them to respond to the new abundance of particulars offered by print and the new world, in turn forming expansive new efforts to collect, order, and archive those particulars. E.g. Moss 1996; Blair 1997; Krämer 2014; Yeo 2014.

⁸ Historians of science have made this argument for the nineteenth and twentieth centuries: Warwick 2003; Vicedo 2012; Shapiro 2013.

⁹ The central scholarship on Lefèvre and his community includes Renaudet 1916; Rice 1972 (hereafter PE); Bedouelle 1976; Hughes 1984. Of these, Rice remains especially useful because of its heavily annotated editions and comprehensive bibliography.

of students. In fact, Lefèvre regularly thanked students for their role in bringing his works into print. A long list may be supplied of the students who corrected Lefèvre's publications—even more, presumably, contributed without acknowledgment.¹⁰ He also attributed the genres that made him famous to his students' ideas. When his patron Germain de Ganay asked why he wrote dialogues, Lefèvre cited his ammanuensis:

Accept this reason. The honorable youth Guillaume Gontier, who helped me in many ways when he accompanied me to the Italian shores [in 1492], easily led me to do this. "If you do this," he said, "you will advise students on how they should ask questions, and how to answer them; thus at once you can usefully assist both student and teacher." He also advised me to prepare readers with an Introduction at the beginning, by which the artfully arranged matter might be committed to memory... (Lefèvre 1493, sig. b1v [PE, 22]).

Lefèvre's response to Germain subtly locates the very origins of textual dialogue in his conversations with a student. It was a topos, but not an empty topos. Between 1490 and 1508, Lefèvre lived and worked with his students at the Collège du Cardinal Lemoine in Paris, a mere ten minutes by foot from the print shops of rue St. Jacques. There he collaborated with students and printers to produce new textbooks for the whole cycle of the arts course. In this collaboration, many of these students became colleagues, notably the theologian Josse Clichtove. Many students, such as the Amerbach brothers and Beatus Rhenanus, became professional bookmen—writers, printers, correctors—after they first apprenticed in Lefèvre's classroom, as even a brief survey will show.

In the still-new print shop, such bookmen brought together the practices of university men and artisans.¹¹ The university printers in this circle were not merely "sworn booksellers" (*libraires jurés*) as in times past, but were often themselves MAs: the illustrious print dynasty of Henri Estienne was founded by a university man, Johann Higman¹²; Jodocus Badius (White 2013); Johannes Amerbach (Halporn 2000); and later inheritors of the Estienne press, Simon de Colines, and Robert and Charles Estienne (Armstrong 1954, Schreiber 1982). As in the Aldine workshop of Venice, in Paris the master bookman oversaw both intellectual and financial sides of the business. In one colophon, Wolfgang Higman recorded himself as both the "ingenious printer" and a canny planner: "Printed at Paris ... by the ingenious printer Wolfgang Hopyl. This thought is always firmly in his mind: great deeds are done not by strength or speed or physical agility, but by planning, judgment, and authority."¹³

¹⁰ Besides those listed in this article, these students included: Wolfgang Pratensis; Petrus Porta Monsterolensis (PE, 137); François Vatable (PE, 249-250); Michael Pontanus (PE, 381-82); Jean Solidus de Cracovie (accompanied Lefèvre in 1500, copied a Vulgate ed. of Job, see Renaudet, p. 506); Jean Multuallis de Tournay, Michel Pontanus Sameracensis, Louis Fidelis (all involved in some way with the 1514 *Cusani Opera*); Jean Pelletier. In this vein, Rice calls the famous printer Robert Estienne Lefèvre's "last and most brilliant disciple" (PE, 494).

¹¹ The overlap between learned and artisanal worlds in the print shop has become a commonplace since Eisenstein 1979, chap. 6. This point has been made by others, e.g. Davis 1966 and 1982.

¹² Higman was received as a bachelor into the University of Paris in 1478, reports Veyrin-Forrer 1995, 97. See also Renouard 1965, 204-205.

¹³ Lefèvre 1495, colophon. "¶ Impressum Parisij in pago diui Jacobi ad insigne sancti Georgij Anno Christi siderum conditoris 1494 duodecima februarij [i.e. 1495] Per

Through an oblique use of Cicero, who opposed youthful agility to measured maturity, the aging printer claimed intellectual engagement with the project as well as practical oversight.

Many students moved between college and print shop, studying with Lefèvre and working alongside Hopyl, Estienne, and Badius, and we should not assume all of them pursued the same career.¹⁴ A surprising number in this circle, however, eventually took the role of master bookman for themselves. These students offer a particularly significant case because they belong to the first generation of students who could approach the entirety of the arts course through printed textbooks. Active in the decades on either side of 1500, these apprentice bookmen offer a case of authorship at the transition from manuscript to print, a period when the material and social organization of print publication were still in flux. During these decades, key elements of *mise-en-page* were not yet fixed: such as the title page, page numbers, paragraph divisions, punctuation, frontispieces, indices (e.g. Smith 2000, Janssen 2005). Moreover, as the next sections will show, the social organization of print production was similarly fluid. In the next paragraphs, a prosopographical sampling of this circle during this formative period will show the significance of their Paris apprenticeships for their careers as bookmen.

The Flemish theologian Josse Clichtove (1472-1543) was Lefèvre's closest collaborator from the late 1480s to around 1521, when they broke over Lefèvre's reform of preaching at Meaux (Bietenholz 1985, 1:317-220; PE *passim*; Massaut 1968; Farge 1980, 88-104). Clichtove's published work grew out of Lefèvre's enterprise, largely in the printing houses of Henri Estienne and then Jodocus Badius. After he gained his MA with Lefèvre at the Collège du Boncourt (c. 1490; Farge 2006, no. 155a), Clichtove took up studies in the theological faculty. Throughout the 1490s, however, he continued to teach the arts course at Lemoine and to edit Lefèvre's works. The extent of their collaboration is hard to overstate: he left his fingerprints on most of Lefèvre's early printed works, beginning with a poem in Lefèvre's first printed work. Most of Lefèvre's famed paraphrases and commentaries on natural philosophy, moral philosophy, and mathematics circulated in editions that included Clichtove's commentaries. Even after receiving a doctorate in 1506, Clichtove produced editions of medieval theologians and Church fathers in collaboration with Lefèvre—he also defended his old teacher in short polemical works against Erasmus as well as against other factions in the theological faculty of Paris. Clichtove first apprenticed in Lefèvre's shop, so to speak, and then became its foreman before he stepped out as an independent author.

The Netherlandish humanist and schoolmaster Johannes Caesarius (c. 1468-1550) similarly began his career in Lefèvre's classroom (Bietenholz 1985, 1: 238-9; PE 104-105; Allen 1906-, 2:172). He first studied in Cologne, but quickly switched to Paris, where he gained the MA in 1498. He returned to Deventer, where he taught at a grammar school beginning an illustrious career as a teacher, humanist, and eventually even a physician—his students included notables such as Heinrich Glarean, Agrippa

ingeniosum impressorem Wolfgangum hopyl. Cui hec sententia semper firma mente sedet: Non viribus aut velocitatibus aut celeritate corporum res magne geruntur: sed Consilio, Sententia, et Auctoritate ¶ Recognitoribus diligentissimis: Luca Uualtero Conitiensi, Guillermo Gonterio, Johanne Griettano, et Petro Grisele: Matheseos amatoribus.” The contrast of youthful “speed and agility” to the aged wisdom comes from Cicero, *De senectute*, 17 (hat tip to Anthony Ossa-Richardson).

¹⁴ Medieval student experience was hardly monolithic; see Schwinges 1992.

of Nettesheim, and Heinrich Bullinger. But his teaching always included publishing as well, and he is best known for his editions of Greek grammar and other works of classical scholarship. This pattern, however, began immediately after leaving Paris with the MA, when he worked a corrector at the press of Richardus Pafraet, who was just beginning to enter the market of school handbooks. Caesarius put his Parisian expertise to work in editions of Lefèvre's introduction to moral philosophy, Clichtove's brief handbook on logic, and a collection of mathematical works by Lefèvre, Clichtove, and Charles de Bovelles (Lefèvre 1502, Clichtove 1504, Lefèvre et al. 1507).

The same pattern of apprenticeship can be discerned in the career of Hieronymus Gebwiler (c. 1473-1545) (Bietenholz 1985, 2:81-82; PE 243-244; Adam 1967, 18-21). He first studied in Basel with the humanist Sebastian Brant, but then went to Paris to study with Lefèvre, graduating MA in 1495. His chief role was as a teacher in the famous grammar school at Schlettstadt, and then in Strassburg, where he encouraged the best of his students to study with his old master in Paris. We have no evidence that Gebwiler served as a corrector in Paris; his own studies concluded while Lefèvre's circle was still learning what print could do. Yet like Caesarius and others, he combined his teaching with work in the press. Gebwiler saw his old colleagues' and teachers' books through print shops in Strassburg, *inter alia* publishing versions of Lefèvre's introductions to logic, natural philosophy, and moral philosophy, sometimes including snippets of Clichtove's commentary as well as his own—through the presses, he adapted the Fabrist university program to a grammar school context (Lefèvre 1511, Lefèvre 1514, Lefèvre 1516).

The school at Sélestat, with Cardinal Lemoine in Paris, became the seedbed for a generation of Alsatian humanists, including the two older sons of the preeminent Basel printer Johann Amerbach: Bruno (1484-1519) and Basil (1488-1535) (Bietenholz 1985, see Halporn 2000). The two youths arrived in Paris together shortly after 1500, and together graduated with the MA in April 1506. Their father had studied with the Paris theologian Johann Heynlin von Stein in the 1470s, and initially wished his sons to take the same path through the Scotist schools; instead, they remained at the Collège de Sainte Barbe while taking some lectures at the Collège du Cardinal Lemoine, attracted by Lefèvre's teaching. As it had for their father, the MA degree gave them the foundation for a career in publishing books. Bruno, an outgoing personality, joined his father's printing shop as a key figure in the great enterprise of editing the works of Jerome, a work the junior partner Johann Froben continued after the senior Amerbach died in 1513. Meanwhile, Basil took a legal degree at Freiburg, but sickness prevented him from practice as a lawyer, and he also found his chief occupation as a corrector in Froben's workshop. This was the the group Erasmus found so congenial when he arrived in August 1514; skilled as expert correctors in both Latin and Greek, they could serve his books to best advantage (Allen 1906-, 3:96-97).

Preeminent among these correctors was Beatus Rhenanus (1485-1538), who studied under Gebwiler at Sélestat before he took the BA and MA at the Collège du Cardinal Lemoine in Paris between 1503 and 1507 (bibliography in Hirstein 2013). While studying with Lefèvre in Paris, Beatus helped publish several of Lefèvre's works, including an edition of Ramon Lull's *Contemplations*, a reframing of the political works of Aristotle and Plato, another on Lefèvre's introduction to the *Nicomachean Ethics* with Clichtove's extensive notes, and an edition of patristic works (Lull 1505, Lefèvre 1506). This experience earned Beatus a firm foothold in the growing business of humanist print. In 1508, after returning to Alsace, Beatus

joined the new printing house of a fellow graduate of the Sélestat school, Matthias Schürer (on whom see Bietenholz 1985, 233, and Vanautgaerden 2012). After 1514, when Erasmus came to the region first attracted by Schürer and then by Froben, Beatus proved one of Erasmus' most trusted correctors and collaborators, as well as a careful editor of ancient and patristic texts in his own right. It was to Beatus that Erasmus entrusted the task of gathering his *opera omnia* after his death in 1536. For my purposes, it is significant that Beatus built his reputation on skills he first exercised in Paris, excising solecisms, comparing newly printed sheets to their manuscript exemplars, and carefully framing new books within appropriate headers, letters, and verses. It was these skills in transforming copy into printed books that made these students bookmen—and indeed, as I shall argue, made them authors.

[INSERT FIGURE AROUND HERE]

Figure 1. Lefèvre and Clichtove 1507, title page and first page. As was often the case in a decade when title page conventions were not yet set, the author's name appears on neither the title page nor the dedicatory epistle to this short, "artful" introduction to Aristotle's *Nicomachean Ethics*. Instead of Lefèvre's name, we find only the names of the student corrector Beatus Rhenanus and the commentator Clichtove, prominently advertised in large letters. Bayerische Staatsbibliothek, shelfmark 1422301 / 2 A.gr.b. 371 (urn:nbn:de:bvb:12-bsb10139325-4), NoC-CC.

3. PUBLICATION MOMENT 1. MANUSCRIPT CIRCULATION IN THE COLLEGE

The student notes of Beatus Rhenanus offer a rare glimpse into this moment of transition between manuscript and print. While he was in Paris, Beatus' teachers finished printing new textbooks for the whole *cursus artium* at the University of Paris—this was the first concentrated programme to renovate the *cursus* in print, and Beatus belonged to the first generation of students that could, in principle, spend their entire university career studying only the printed textbooks of their masters. His extant library shows that he intensively studied these printed text books; they are crammed with detailed notes, many evidently taken in class (Oosterhoff 2015, 8-11). But his notes also reveal hints of the origins of these printed books in a primary circulation of manuscripts. Such printed textbooks grew out this first manuscript context of collaborative learning.

One of his notebooks is especially revealing. At first glance it appears simply to be a series of class notes. The first sections are a series of *collectanea* on works of logic and natural philosophy. One titled *In Librum Introductorium naturalis philosophiae Aristotelis collecta* appears to be complete, concluding with the following excipit:

This *Introduction to Aristotelian Physics* was read at Cardinal Lemoine in Paris, and set down in letters by me, Beatus Rhenanus.

[BHS MS 58, 163v. "Parrhisijis In cardinali Monacho: Hoc In Physicen Aristotelicam : Introductio Lecta enim et A me "literis mandata" Beato Rhinat<wer>."]

Clearly these texts represent lectures or "readings" (*lectio*) in the college, in some format. Since not all are finished, and there are generous sections of blank pages, these texts seem to be rough copy, perhaps written as the lecturer spoke.

But two other texts in the notebook are not so clearly related to lectures. One is a series of theses that Emmanuel Faye has identified as belonging to Charles de Bovelles, introduced with some quotations from Nicholas of Cusa, which sets out a series of statements on the metaphysical place of man in the universe (Beatus, BHS MS 58, 195r-206r. This work is edited by Faye 1998). It concludes with the simple

colophon *Finis Parrhisijs . Anno . :1:5:0:4: . Cardi[nali]: Mo[nacho]:* (Finished in Paris, in the year 1504, at Cardinal Lemoine). Since it is complete, copied in a fair hand, and there is no reference to a classroom context, very likely this text was circulated in the college. Additional support for this possibility comes from independent short works that Bovelles published around the same time, which similarly consist of evocative theses without further elaboration (Bovelles 1500, Bovelles 1501). Such lists of theses could therefore be a publishable genre in their own right.

The circulation of manuscript tracts within the confines of the college becomes even more likely with the next treatise in Beatus' notebook. This one is titled *Iacobi fabri Stapulensis In Libros De Anima, analogiarum Compendium*, and concludes unambiguously with the Greek *telos*, and *Finis ANALOGIARUM* (Rhenanus BHS MS 58, 206v). Here we have a series of reflections on physical analogies for mental or metaphysical operations—a popular theme in Lefèvre's circle.¹⁵ Not only is the brief work complete, but it is copied in a fair hand. In particular, one tell-tale sign convinces me that the work was in fact copied from another manuscript: the work includes signature markings. Since these markings do not match the notebook's signatures, they must come from another exemplar that Beatus copied.

These manuscript treatises, copied into the back of a student's notebook, can be understood within the late medieval framework of coterie publication as Daniel Hobbins has elucidated for the decades just before print, around 1400. Hobbins defines manuscript publication as typically happening in two moments. In the first, an author shares the work in a limited number of copies within an intimate circle of readers. Then, in a second moment of publication, that circle of readers may, with or without the author's encouragement, copy and circulate the work more broadly. In a manuscript culture, both of those moments should be seen as "publication", though it is the second which explains the broad dispersion of works like Gerson's tracts or Thomas a Kempis' *Imitatio Christi* (Hobbins 2009).

These two moments of publication help us consider why in Lefèvre's circle certain works circulated in manuscript, and why others were printed. Those works clearly limited to manuscript publication were especially elite and esoteric in nature. We know that early patrons of the circle, the brothers Germain and Jean from the wealthy and powerful officer family Ganay, received deluxe manuscript copies of certain "books of many Platonists" from Ficino, who also dedicated his translation of Athenagoras' *De resurrectione* to Germain in manuscript copy in 1495.¹⁶ Lefèvre's own dedications follow the same pattern. Ficino's *prisca theologia*, perhaps with Germain's encouragement, was the starting point for Lefèvre's treatise *De magia naturali*, which Jean-Marc Mandosio has shown was never intended to be published.¹⁷

¹⁵ Take, for example, the many visual and physical analogies in Bovelles' *De sensu*, analysed by Klinger-Dollé 2016.

¹⁶ Ficino also seemed to think that Germain had manuscript copies of Plotinus. Cit. Victor 1978, 50. Ficino's student Francesco da Diacetto dedicated at least two special manuscript defenses of Plato to Germain, described in Kristeller 1956, 1: 314, 316. Germain had the book printed in Paris in 1498, two years after Ficino's death; see Kristeller 1956, 51-54, 126, 127.

¹⁷ Mandosio 2013 puts to rest the assumption, traceable back to Renaudet, that this manuscript never made publication because of Lefèvre's fear of the theology faculty

The text exists in four manuscripts, but only one has all six books; the others have only the first four books. Mandosio points out that the first four books are those that are written as a dialogue between Lefèvre, in the role of sage, and his companion Germain de Ganay himself as student. The last two books in the Olomouc copy are written not as dialogue, but as a treatise; they were added, Mandosio suggests, to a text that had been published as a dialogue in manuscript in the early 1490s, perhaps at the request of Germain himself. The esoteric themes of secrets of nature, Cabbala, alchemy, and *magia Pythagorica* go a long way towards explaining why this text was not meant for print; recent scholarship has shown that manuscript was a main mode of diffusing sensitive or dangerous texts, such as those of magic (Barbierato 2011). Clearly this was not an introductory text; the manuscript reflected Germain's place within a close circle of *cognoscenti*.

Even natural magic was too dangerous to set before students in textbooks. Nevertheless, some of the university books Lefèvre first published in manuscript are consciously aimed at related esoteric subjects, and their introductions flatter patrons with the sense of inclusion within circles of high-minded friendship. Lefèvre's first mathematical work, after George of Trebizond convinced him to recover the discipline for the glory of Paris, was an edition of Jordanus de Nemore's *Elements of Arithmetic*. Though first printed in 1496, the book must have been published in manuscript before 1494, because early that year Lefèvre dedicated his dialogues on Aristotle's *Metaphysics* to Germain de Ganay, and mentioned that he had already dedicated his edition of the *Arithmetic* to Jean de Ganay. Mathematics was especially important for Jean as a kind of "mirror and rule of justice," because he was an important lawyer in the Paris *parlement* (PE, ep. 6, 21). For Germain, a bishop called to priestly service, Lefèvre offered metaphysics, the study of eternal truths, "which the Platonists call ideas," first studied as mysteries by the Egyptian priests and Chaldean magi. Neither of these treatises were basic school texts; they were advanced topics. The role of manuscript publication was to foster what Brian Richardson calls "a sense of close communication and solidarity among those with similar tastes and interests" (Richardson 2009, 1-2). Manuscript publication suited the esoteric interests that might lure elite patrons.

But Lefèvre's more mundane school introductions also fit this model of coterie manuscript publication, at least initially. His earliest known text was not published until at least four years after being written; the *Introduction to Metaphysics*, which was printed with four additional dialogues in 1494, was first written in 1490, two years before Lefèvre's first printed publication *Paraphrases on the Whole of Natural Philosophy*, and one year before he traveled to Italy.¹⁸ Another allusive example is Lefèvre's brief 56 octavo pages of *Logical Introductions* (1496).¹⁹ The title page reveals that these were "diligently gathered together by Josse Clichtove." The implication is that the work—like the tracts by Bovelles and Lefèvre in Beatus

after they prosecuted the royal astrologer Simon de Phares in 1495. Cf. the first chapter of Boudet 1997.

¹⁸ This information is added to the 1515 edition of these introductions, published with Bruni's translation. PE, 354, 358.

¹⁹ Lefèvre 1496a. See PE, ep. 13, 39. "Satis enim est ea vel in transcurso (velut qui exploratores hostile agmen transcurrunt) attigisse." While 56 pages in octavo may not seem so short, these small pages surveyed material that a competing textbook covered in 338 pages in folio: cf. Bricot et al. 1495.

Rhenanus' notebook—had already been available, likely circulated in manuscript among close students like Clichtove.

Here the function of manuscript is still to reinforce intimacy, but not through advanced, difficult, or dangerous intellectual topics. Precisely the opposite. Evidently, such handbooks gathered manuscript notes that had functioned as glorified crib sheets. They displayed modes of debate and offered mnemonics and diagrams for easy recall, with short potted arguments to prepare swiftly for debate. Within the intimacy of the college community, therefore, manuscript coterie publication not only protected esoteric subjects, but was the way students shared the helps and crutches of ordinary classroom learning. The distinctive Fabrist introductions seem to have originated in student practices of circulating manuscript tips for managing the curriculum—doubtless a kind of collaborative learning that had long served university students, even though evidence is rarely available to historians. Such manuscript circulation was the first source of this circle's distinctive, collaborative approach to the arts course.

After this first stage of manuscript circulation, print also offered a powerful second moment of publication, when the circle of intimates replicated the work for a broader audience. Not only did Clichtove gather the material for the *Logical Introductions*, but in fact Lefèvre's students Guillaume Gontier and David Laux did all the editorial work, as a postscript to the first edition indicates. If Lefèvre initially hesitated to publish in print, his students were more enthusiastic about what print could do. It was their industry that made these introductions public.

4. PUBLICATION MOMENT 2. STUDENTS IN THE PRINT SHOP

Apprenticeship offers a useful model for understanding the role of students in this second moment of wider publication. University students, as in artisanal guilds, produced new physical objects: books. From the thirteenth century at least, students complained when masters lectured too quickly to let them copy texts *verbatim*, producing their own copy of the text or commentary in question.²⁰ In the reading halls, some students copied books, often for extra money, working within the *pecia* system. This was the hub of university book production: *libraires* dealt in old and new books, paper and ink, and would rent out *pecia* (sections of manuscripts that had been corrected and certified) to students and professional scribes.²¹ When books began to be printed, student participation in book production began to change. In particular, there was a new division of labor. In the line of production, the newcomers were pressmen, manual workmen who sweated over the presses.²² To set type, print shops also needed compositors who were at least somewhat learned, as well as learned clerics to correct the proofs as they came off the press.

²⁰ That this was normal for the later middle ages has been challenged by Saenger 1999, 120–148. It is possible that student requests for teachers to speak at a copyable speed rose during the Renaissance: Blair 2008; Waquet 2003. See also the taxonomy of university practices given by Weijers and Holtz 1997.

²¹ For the structural description of this system, see Destrez 1935, Rouse and Rouse 1988.

²² The physical labor of a handpress is prodigious, even for later, more efficient presses. Various new crafts were associated with print, such as punch-cutting, type-founding, press-building (Renouard 1901).

In guilds and other artisan corporations, apprentices were not necessarily the lowest status figures in a workshop. Such youths were usually entrusted to the master's care by a parent, under a contract that required that they receive training in the entirety of the craft. Unlike day labourers and domestic help, apprentices had rights not to be deployed only in menial tasks unrelated to the profession. Apprentices therefore expected to work in some relation with the master, on works to which the master would put his name. At least in principle, apprentices were marked out for advancement (E.g. Epstein 1998; De Munck 2007; and Patrick Wallis in this volume on the expectation of advancement).

Likewise, the apprenticeship model reveals some students in a middle stratum within the print shop. Early print shops were often populated with university graduates and students, and it is not surprising that Lefèvre's first printers, Wolfgang Hopyl and Johann Higman, were university men, Higman himself having received the bachelor degree in 1478 (Claudin 1900, 1:350). Such early printers frequently found their correctors in universities, often among senior students. The heavy labor of pressmen required more dexterity than literacy, and even compositors did not always read with ease. But to check the proofs, to ensure that they reflected the author in the best possible light, to guarantee every letter was in its place, every solecism safely eluded, to compile swelling indices, and to compose the prefaces and printer advertisements—these tasks required strong Latin, a keen eye, and a thick skin to withstand competing pressure from authors and printers (Grafton 2011, 6–32, and *passim*). In the hierarchy of book making, correctors belonged to the world of work, namely the print shop; Grafton has shown that although they were often as erudite as their authors, they were more often ignored if not unjustly blamed for errors (cf. Richardson 1994). Correctors of Lefèvre's works often worked directly alongside the pressmen, *recognitores in officina* (Tyler 1952, 23). It would not have been unusual for a corrector to be responsible for the detailed table indexing Lefèvre's commentary in his *Text on the Sphere*.²³

As one of Lefèvre's closest collaborators, Josse Clichtove's hand is very often indistinguishable from Lefèvre's.²⁴ Clichtove corrected Lefèvre's first printed book in 1492, and even added some of his own verses, becoming author as much as editor. In these verses (which disappeared in later editions) Clichtove praised the printer Higman, enjoining the reader to thank this German printer, who took up the job at his own expense. He added that he himself had, as well as he could, corrected any errors that had been left "in lead"—that is, the mistakes of compositors—together with a certain "faithful Bohemus."²⁵ It seems quite likely that Clichtove's helper was one Stephanus Martini de Tyn (Bohuslas Tinnensis), from Prague, who was then a student in the medical faculty (Massaut 1968, 1:186n46; cf. PE 15). Not long after this, the Frisian humanist Viglius Zuichemus noted in the illustrious shop of Froben in 1534 that a corrector might work with a reader (Gerritsen 1991). Stephanus might have read the manuscript exemplar aloud, while Clichtove collated it with the proof. In any

²³ This and the next three paragraphs compress an argument from Oosterhoff 2018, 92-94.

²⁴ It must be said, however, that Lefèvre attempted a much more eloquent Latin; Clichtove's is often more perspicacious if less inspiring.

²⁵ Lefèvre 1492, below colophon: "Debetis grates Alemano et adusque Johanni | Higman, qui proprii sumptibus egit opus. | Mendam corripui fido comitante Bohemio | (Ut potui) in plumbo si qua relicta fuit."

case, Lefèvre benefited from the attention of experienced students and fellow academics in preparing his long, folio volume for publication, and his readers knew it.

Indeed, Lefèvre's introductions to university disciplines were printed with the help of a number of his students, and some followed Clichtove's example in advertising their involvement. Gontier, already mentioned as Lefèvre's *amanuensis* during his travels to Italy, corrected Lefèvre's popular *Moral Art* (1497), and had his name put on the titlepage. Lefèvre's mathematical books seem to have drawn the widest involvement of students. The *Text on the Sphere* (1495) colophon includes no fewer than four "recognitores diligentissimi" and "matheseos amatori": Lucca Walter, Jean Grietan, Pierre Griselle, and Lefèvre's *amanuensis* Guillaume Gontier. The number of correctors makes it likely that they made a gift of their time—more likely than Higman paying four correctors.²⁶ Four correctors may have been needed to deal with the large number of diagrams, charts and numbers in the book, always in need of yet one more recalculation or comparison with the original. In his prefatory letter, Lefèvre cited "my domestic, Jean Grietan" as a skilled abacist, describing his learning in the variety of mathematical disciplines and saying that he had been a great help in writing the book (Lefèvre 1495, a1v: *Affuit levamini domesticus noster Ioannes Griettanus, abaci numerandique peritiae et reliquae matheseos non inscite studiosus; scripsit opus et quasi fesso umerum subiectit Atlanti*). The word "domestic" here suggests that Grietan earned his bursary at the Collège du Cardinal Lemoine through household labour, a common arrangement in the Parisian colleges. But instead of carrying water and wood, young Jean was put to work as a computer, no doubt helping to produce the numerous tables of longitudes and latitudes, as well as ascensions of the zodiac that illustrated Lefèvre's commentary.

Another colleague at the college, David Laux, apparently also bore the weight of the larger and much more difficult *Elements of Arithmetic*, in 1496, "the year of the Lord, who formed all things in number and harmony." The colophon emphasized that the printers Johann Higman and Wolfgang Hopyl had published the lavishly illustrated work "at their own heavy labor and expense," sweating for the sake of Parisian students—adding, not quite as an afterthought, that that they had been helped by "David Laux, the Briton from Edinburgh, who diligently corrected the whole thing from the exemplar" (Lefèvre 1496b, colophon: *Et idem quoque | facit David Lauxius Brytannus Edinburgensis: Ubique ex archetypo diligens operis recognitor*). Given this rhetoric and the financial risk associated with such a labor-intensive, expensively illustrated text, it does seem likely that the colophon was written by the printers themselves, and that the book was indeed a labor of love, or at least economic nerve. (Perhaps they even paid Laux.)

Indeed, the omnipresent labour of students in these books presents another analogy with apprenticeship, in which training is exchanged for labour. Fabrist textbooks were among the most frequently reprinted works of Henri Estienne's press: in Estienne's first decade on his own, from 1502 to 1511, twenty-one out of thirty-eight books he published were Fabrist textbooks—and the remainder was mostly works of theology or philosophy edited by Lefèvre and his students (Renouard 1843, 1-10). I know of no account books that would give a closer picture; but since by far most of Estienne's output was Fabrist works, it seems likely Estienne's profits, or at

²⁶ Higman may have been low on funds in 1495, when perhaps coincidentally, Higman lent a property deed to the Hôtel-Dieu of Paris as surety for a large loan, which was not recovered from his widow until 1508. Renouard 1901, 88; van Moé 1935.

least the economic survival of his print shop, depended on the labour of these students.²⁷ Yet there is no evidence of Estienne paying Lefèvre or these students for their work. So far I have chiefly highlighted the experience that students gained in return for their extensive labour. Lacking other evidence, it seems unlikely that the leading students chose to work in print shops in exchange for fee exemptions; the Amerbach boys, for example, complain much about fees, but never mention repayment of this kind.

Instead, besides experience, students earned cultural credit for their labour. Learned dedications, letters of flowery praise between friends, lavish prefatory poems, elegant colophons—such paratexts were the currency of the Republic of Letters (Haugen 2007). As we have seen, the students who printed Lefèvre's were handsomely rewarded in this economy. The ultimate payment, it would seem, was the chance to enter the domain of authorship. Through the names in these paratexts, we trace the first steps of students towards becoming authors. Lefèvre might have singled out his friend Étienne for thanks in his first publication, the *Paraphrases on the Whole of Natural Philosophy* of 1492, but he gave Clichtove a greater opportunity: the short poem thanking Higman and Stephanus was Clichtove's first appearance in print. But paratext could itself become a key part of the text. In 1502, Clichtove supplied the *Paraphrases* with a commentary that frequently was longer than Lefèvre's own paraphrase. In the following four decades, it was *this* version of Lefèvre's paraphrases that was most frequently reprinted.²⁸ Clichtove also piggybacked on Lefèvre's authorial gravity in 1517, when he took the few pages of Lefèvre's *Astronomicon* and augmented it with over a hundred pages of dense commentary. Similarly, Charles de Bovelles' first active role in print was not his *Introduction to the Philosophy of Opposites* (1501), but from the year before. In 1500 Lefèvre invited him to edit a short *Astronomical Ring*, a description of a miniature astrolabe that he had found in Rome. Apprenticeship as a corrector could lead to authorship.

5. CRAFT AND BOOKS

The products of this circle were books, and books principally aimed at knowledge of the university arts course: logic, mathematics, natural philosophy, and ethics. Yet the language of craft permeated the enterprise. Lefèvre's own name—*fevre* in old French, latinized as *faber*, means workman or maker²⁹—probably came from his Picard family, but his friends played on its craft meanings for scholarship. He was a master in the craft of forming student souls, “like another craftsman Daedalus having artfully fashioned a chariot.”³⁰ Such metaphors recall the pioneering work of Mary Carruthers, already mentioned, who showed how medieval accounts of monastic thought were framed by analogy with craft (Carruthers 1998). Even after the period Carruthers addresses, the university built its whole edifice of knowledge on the

²⁷ The closest account of the economics of these presses, to my knowledge, can be deciphered from Renouard 1843, which includes information from price lists given by Henri Estienne's son Robert, probably in the 1530s (Renouard describes these sources at xiv-xv).

²⁸ The excellent bibliography in PE can be supplemented with the entries on Lefèvre and Clichtove in Lohr 1988.

²⁹ Godefroy 1884, s.v.

³⁰ Cuno and Rhenanus 1512, A2r. “qui ut alter Dedalus faber carpento ornato affabre fabrefacto.”

analogy of craft. Above I have stressed the social analogy; here I turn to the conceptual analogy.

The analogy was partly a continuation of the ancient discourse of the liberal arts. The enduring power of this tradition was enshrined in the Latin word *ars*, which like early modern vernacular cognates *art*, *arte*, *Kunst*, did not differentiate learned art from practical craft; we may use the two words interchangeably.³¹ Josse Clichtove and Charles de Bovelles both wrote schematic overviews of the arts in which one can trace Hugh of St Victor's account of the liberal arts as analogues of the "servile" mechanical arts or crafts. Bovelles goes one step further, offering a historical development from the mechanical arts that first supplied necessities for bodily sustenance, to the invention of free arts when people first had leisure to consider abstract concepts (beginning with arithmetic and astronomy) (Bovelles 1500, 6r). Such schemes depended on, while also limiting, the notion of *ars* as *techne*, technique or knowhow, for they insisted on a strict distinction between manual and mental craft. From the outset, Clichtove retained the association of "servile" arts with the servant and the body, while the liberal or learned arts belonged to the master and the soul (Clichtove 1520, A2v).

But Aristotle was another university resource for rethinking this distinction. A continuum between manual and learned craft emerged in Lefèvre's dialogues on Aristotle's *Metaphysics*. The dialogue considers what sort of knowledge characterises the wise man, who is thought to possess the greatest amount of certain knowledge. The discussants agree that "the experienced person without craft works with greater certainty than the craftsman without experience."³² The kind of "certainty" here has to do with the power to reason from one instance to another. Experience only offers knowledge of singulars, while craft (*ars*) involves knowledge of universals; therefore someone who has experienced the singular act of binding a book (let's say) just one time is more likely to succeed in doing it again than someone who has theory but no experience. In the dialogue, the student points out to the teacher that few people master the universals or theory of an art without having first experienced some of it. After all, a universal is inferred from many experienced instances. The teacher recognises that experience does lead to art, but also that sometimes one might want to have art indirectly, by report or from a book. An example comes from medicine: one might happen to be bitten by a snake immediately after drinking a certain vinegar. Finding that the vinegar kept the bite from making them ill; one might then discover this for similar snake bites, for oneself and for others. This experience is a reliable mode of getting knowledge. But, the teacher hints, this is an unwieldy procedure for gaining the whole craft of healing: one might also read such remedies in a book, learning from the experiences of others. Note that such knowledge is not necessarily bookish—it might be passed on by visual inspection or by verbal report. Besides the physician, the other main example of a craftsman (*artifex*) in this passage is the architect, whose knowledge is not limited to books but nonetheless is a form of universal knowledge that transcends particular instances. The way to wisdom is through books—but the knowledge that went into books was ultimately drawn from experience.

³¹ For related terminology in the early modern period, see Marr, Garrod, Marcaida, Oosterhoff 2018.

³² Lefèvre and Clichtove 1502, 417v. "Expertus non artifex artifice non experto certius operatur."

Indeed, the organization of bookish knowledge drew on the analogy of manual crafts. Aristotle began the *Nicomachean Ethics* with the sentence that “every art, every teaching and activity, and likewise every choice appears to seek a certain good,” making craft his starting point for practical reasoning of every kind.³³ The political art of directing a city therefore was an “architectonic” discipline by analogy to the architect, whose craft directed all subordinate building trades. While Aristotle did not hesitate to suggest a hierarchy between the various arts, he awarded each a particular dignity; because each art has its own ends, it cannot be reduced to some other art.

Even manual arts had intellectual value, while intellectual arts required practical expertise. In the *Nicomachean Ethics* Aristotle classified art as a quality of mind, a *habitus* to be set alongside prudence and science; *ars* or *techne* was a *habitus* specifically directed to making. As Lefèvre explained, “art is the same as a *habitus* that makes according to true reason.... Every art deals with generation and the production of artifice.”³⁴ In Lefèvre and Clichtove’s brief handbook to moral philosophy, *ars* features as one of the intellectual virtues. Clichtove again notes the ancient contrast of mechanical and literate arts; but frames the discussion more securely within what the two share. After all, painting and writing require the same virtue of their practitioner: “Just as pictorial art deals with depiction by true reason, according to its rules, so the art of writing also proceeds by true reason and according to the matter itself.”³⁵ In the next sentences, Clichtove describes the preparation of ink, paper, and pen before the formation of letters on vellum, and compares these to a builder’s tools and his attention to the cement, planks, and stones with which he will build. Authorship is explicitly and literally a craft oriented towards making.

This stress on the factive character of writing suited the Fabrist circle’s interest in producing textbooks. Since they held that craft was oriented around material objects, contingent on the maker’s skill or artfulness, they also recognised that such objects included the handbooks they made.³⁶ They supplied these books with titles advertising their “artfulness”: they are repeatedly described as *artificialis*, which elaborate their topics in an *artificiose* manner (recall Fig. 1). Such adverbs and adjectives make claims about the physical object, in the first place. They claim that the book is well made. As I alluded above, these texts are only components within complex, innovative objects. They are surrounded by synoptic tables, plentiful figures and diagrams, extensive indices, and experimental title pages and frontispieces—these likely authored by student-apprentices. But, secondly, the claim of artfulness, within the Aristotelian discourse of craft, brings together the material and conceptual aims of these objects: these books are artful precisely because their material construction suits their aims, which is to accomplish a certain habit of knowledge within their users. The

³³ I translate here the Latin version by Argyropolus published in Lefèvre 1535, 2r. “Omnis ars, omnisque doctrina atque actus, itidem et electio, bonum quoddam appetere videtur.” Aristotle also developed accounts of hand and instruments as the foundational metaphor for abstract thought, in *De anima*.

³⁴ Lefèvre 1535, 61r. “idem est ars et habitus vera cum ratione factivus.... Omnis ars circa generationem artificiique productionem versatur.”

³⁵ Lefèvre and Clichtove 1507, 43r. “Ut ars pictoria ad pingendum vera cum ratione et secundum illius artis regulas, et ars scribendi ad scribendum vera itidem cum ratione et quemadmodum res ipsa exigit.”

³⁶ Lefèvre and Clichtove 1507, 43r. “ut domus, tunica, calceus potest esse et non esse; versatur enim ars circa contingentia.”

crafts bring together particulars with universal judgments in a way that makes *scientia* possible, as Lefèvre had described it in his dialogues on the *Metaphysics*.

With uneven success, some of Lefèvre's students brought together the domains of craft and books in other ways too. One example is their special attention to handbooks and treatises of mathematics, a discipline they defended not only because it sharpened minds for conceptual thought, but because it bore particular fruits in practical domains. One of Lefèvre's closest students and colleagues, Charles de Bovelles, especially represented the circle's fascination with printed images, diagrams, and other visual apparatus that integrated the hands, eyes, ears, and mind (Klinger-Dollé 2016). Bovelles developed a philosophy that grounded an operative vision of knowledge, in which intellectual progress depended on human creativity—both within the mind and in the world of manual technique. Bovelles even explored these commitments in the world of work, writing the first printed practical geometry in French, proclaiming it would be useful to artisans and “common men,” while relating observations of craft practices around his native Picardy (Bovelles 1511).³⁷

6. CONCLUSION

At a very general level, it is obvious that learning in early modern universities retained a residual analogy to learning in craft corporations, owing in part to the origins of universities as guilds. Granting this analogy sustained attention, however, reminds us that learning is more than collecting clever concepts, schemas, or a canon of thoughts. Early modern university students also learned how to make: notes, lists, diagrams, copies, poems, and even entire books. Not all students became authors in their own right, but I have offered a case in which many students took a leading role in collecting, collating, emending, and elaborating the work of their master, the named author. While the evidence of Lefèvre's circle offers an unusually rich glimpse at these practices, I suspect we would find many similar instances if we look elsewhere.³⁸ Such collaborative authorship could be further compared to the shared enterprise of the artisan master's atelier.

The early modern print shop blurs the analogy between university and workshop. Around 1500 students could find the print shop a novel means for bringing college manuscripts into wider circulation. I have found it useful to distinguish two moments of production, which had characterised late medieval coterie practices of publication. Students first shared the master's study manuals, and then brought them to wider publics through the press. The first moment established the community through intimacy; the second offered students a means of extending their master's recognition while they themselves gained experience and credit in exchange for labour. This second moment of print publication offers, therefore a particularly tight analogy with apprenticeship. Further work would need to determine how far beyond the early sixteenth century such practices lasted.

Early modern university students likely shared more with their fellow apprentices in the crafts than they do with modern scholars—which should give us pause before we project modern emotions onto past experience. Historians have often distinguished “popular” and “elite” social experiences in early modern culture, sometimes to the point of denying a shared horizon of meaning. Craft and knowledge present one such distinction. The Aristotelian training of premodern universities is

³⁷ On the artisanal sources of this book, see Brioist forthcoming and Oosterhoff 2017.

³⁸ For example, see the current project of Ann Blair, e.g. Blair 2017b.

often presented as a source of antipathy to manual and craft knowledge. But this is a partial story at best. To be sure, Aristotelian accounts of the crafts and sciences set out a hierarchy of knowledge in which conceptual knowledge held the highest place. But artisans also were considered to have conceptual knowledge. In fact, these texts picked out craft as the driving exemplar of all forms of knowledge—the foundation of wisdom itself. It was within this framework that the circle of Lefèvre treated their own bookish activities as productive crafts. In the classroom, medieval masters and disciples had striven together to gain the craft required for weaving words with ink and paper, for tying pages together into books. I would add that the early print shop intensified the analogy of university and workshop, enabling students to engage and even control the process of producing books, becoming a key stage in the apprenticeship of a class of early modern bookmen.

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Reference List

- Adam, Paul. 1967. *L’Humanisme à Sélestat: L’école, les humanistes, la bibliothèque*. 2nd ed. Sélestat: Imprimerie Stahl Sélestat, 1967.
- Allen, Percy Stafford. 1913. “Erasmus’ Relations with His Printers.” *The Library* 13(1): 297–322.
- Allen, Percy Stafford et al. eds. 1906. *Opus epistolarum Des. Erasmi Roterdami*. vol. 2. Oxford: Clarendon.
- Anheim, Étienne. 2013. “Les hiérarchies du travail artisanal au Moyen Âge entre histoire et historiographie.” *Annales. Histoire, Sciences Sociales* 68(4): 1027–1038
- Armstrong, Elizabeth. 1954. *Robert Estienne, Royal Printer: An Historical Study of the Elder Stephanus*. Cambridge: Cambridge University Press.
- Barbierato, Federico. 2011. “Writing, Reading, Writing: Scribal Culture and Magical Texts in Early Modern Venice.” *Italian Studies* 66(2): 263–276.
- Bedouelle, Guy. 1976. *Lefèvre d’Étaples at l’intelligence des Écritures*. Genève: Droz.
- Bietenholz, Peter G. 1971. *Basle and France in the Sixteenth Century*. Geneva: Droz.
- Bietenholz, Peter G. and Thomas B. Deutscher, editors. 1985. *Contemporaries of Erasmus: A Biographical Register of the Renaissance and Reformation*. 3 vols. Toronto: University of Toronto Press.
- Blair, Ann. 1997. *The Theater of Nature: Jean Bodin and Renaissance Science*. Princeton University Press.
- Blair, Ann. 2008. “Student Manuscripts and the Textbook.” In *Scholarly Knowledge: Textbooks in Early Modern Europe*, edited by Emidio Campi, Simone De Angelis, and Anja-Silvia Goeing, 39–73. Geneva: Librairie Droz.
- Blair, Ann. 2017a. “Humanism and Printing in the Work of Conrad Gessner.” *Renaissance Quarterly* 70(1): 1–43.
- Blair, Ann. 2017b. “The Dedication Strategies of Conrad Gessner,” in *Professors, Physicians and Practices in the History of Medicine*, edited by Gideon Manning and Cynthia Klestinec, 197–237. Cham: Springer.
- Boudet, Jean-Patrice. 1997. *Le Recueil des plus celebres astrologues de Simon de Phares*. 2 vols. Paris: Honoré Champion.

Bovelles, Charles de. 1500. *Libellus de constitutione et utilitate artium humanorum, in quo et applicatio sermocinalium ad rerum disciplinas atque imprimis Dialectice edocetur*. Paris: Jean Petit.

Bovelles, Charles de. 1501. *In artem oppositorum introductio*. Paris: Wolfgang Hopyl.

Bovelles, Charles de. 1511. *Géométrie en françoys*. Paris: Henri Estienne.

Bricot, Thomas, George of Brussels, and Peter of Spain, *Expositio Magistri Georgii super summulas*. Paris, 1495.

Brioist, Pascal. Forthcoming. “Les singularités de la géométrie pratique de Charles Bovelles.” In *Bovelles philosophe et pédagogue*, edited by Joscelene Sfez and Anne-Hélène Klinger-Dollé.

Carruthers, Mary. 1998. *The Craft of Thought: Meditation, Rhetoric, and the Making of Images, 400-1200*. Cambridge: Cambridge University Press.

Chartier, Roger. 1994. *The Order of Books*. Cambridge: Polity.

Clark, William. 2006. *Academic Charisma and the Origins of the Research University*. Chicago: University of Chicago Press.

Claudin, Anatole. 1900. *Histoire de l'imprimerie en France au XVe et au XVIe siècle*. Paris.

Clichtove, Josse. 1504. *In terminorum cognitionem introductio*. Deventer: Richardus Pafraet.

Clichtove, Josse. 1520. *Isagoge de artium scientiarumque divisione*. Paris, 1520.

Courtenay, William J. 1988. *Teaching Careers at the University of Paris in the Thirteenth and Fourteenth Centuries*. Notre Dame, IN: University of Notre Dame Press.

Cuno, Johannes, and Beatus Rhenanus. 1512. *Divini Gregorii Nyssae Episcopi qui fuit frater Basilii Magni libri*. Basel: Matthias Schürer.

Davis, Natalie Zemon. 1966. Richard J. Schoeck, “Guillaume Rouillé, Businessman and Humanist.” In *Editing Sixteenth Century Texts*, edited by Richard J. Schoeck, 71–112. Toronto: University of Toronto Press.

Davis, Natalie Zemon. 1982. “Le monde de l'imprimerie humaniste: Lyon.” In *Histoire de l'édition française*, ed. Roger Chartier, Jean-Pierre Vivet, and Henri-Jean Martin, vol. 1, 255–77. Paris: Promodis.

Destrez, Jean. 1935. *La Pecia dans les manuscrits universitaires du XVII et XIV siècles*. Paris: Editions J. Vautrain.

Dupré, Sven, editor. 2014. *Laboratories of Art: Alchemy and Art Technology from Antiquity*. Dordrecht: Springer.

Eisenstein, Elizabeth. 1979. *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early-Modern Europe*. 2 vols. Cambridge: Cambridge University Press.

Epstein, Stephan R. 1998. "Craft Guilds, Apprenticeship, and Technological Change in Preindustrial Europe." *The Journal of Economic History* 58(3): 684–713

Farge, James K. 1980. *Biographical Register of Paris Doctors of Theology, 1500-1536*. Toronto: Pontifical Institute of Mediaeval Studies.

Farge, James K., editor. 2006. *Students and Teachers at the University of Paris: The Generation of 1500. A Critical Edition of Bibliothèque de l'Université de Paris (Sorbonne), Archives, Registres 89 and 90*. Leiden: Brill.

Faye, Emmanuel. 1998. "Nicolas de Cues et Charles de Bovelles dans le manuscrit 'Exigua pluvia' de Beatus Rhenanus." *Archives d'histoire doctrinale et littéraire du moyen âge* 65: 415–50.

Ferruolo, Stephen C. 1985. *The Origins of the University: Schools of Paris and Their Critics, 1100-1215*. Stanford: Stanford University Press.

Gerritsen, Johan. 1991. "Printing at Froben's: An Eye-Witness Account." *Studies in Bibliography* 44: 149–150.

Godefroy, Frédéric Eugène. 1884. *Dictionnaire de l'ancienne langue française et de tous ses dialectes du 9e au 15e siècle*, vol. 3. Paris: F. Vieweg.

Grafton, Anthony T. 2008. "Textbooks and the Disciplines." In *Scholarly Knowledge: Textbooks in Early Modern Europe*, edited by Emidio Campi, Simone De Angelis, and Anja-Silvia Goeing, 11–36. Geneva: Librairie Droz.

Grafton, Anthony T. 2011. *The Culture of Correction in Renaissance Europe*. London: The British Library.

Halporn, Barbara Crawford. 2000. *The Correspondence of Johann Amerbach: Early Printing in Its Social Context*. Ann Arbor, MI: University of Michigan Press.

Haugen, Kristine Louise. 2007. "Academic Charisma and the Old Regime." *History of Universities* 22(1): 199–228.

Hirstein, James, editor. *Epistulae Beati Rhenani. La Correspondance latine et grecque de Beatus Rhenanus de Sélestat. Edition critique raisonnée avec traduction et commentaire*, vol. 1 (1506-1517). Turnhout: Brepols, 2013.

Hobbins, Daniel. 2009. *Authorship and Publicity Before Print: Jean Gerson and the Transformation of Late Medieval Learning*. Philadelphia: University of Pennsylvania Press.

Hugh of St. Victor. 1961. *The Didascalicon*, translated by Jerome Taylor. New York: Columbia University Press.

Hughes, Philip Edgcumbe. 1984. *Lefèvre: Pioneer of Ecclesiastical Renewal in France*. Grand Rapids, MI: Eerdmans, 1984.

Janssen, Frans A. 2005. "The Rise of the Typographical Paragraph." In *Cognition and the Book: Typologies of Formal Organization of Knowledge in the Printed Book of the Early Modern Period*, edited by Karl A.E. Enenkel and Wolfgang Neuber, 9–32. Leiden: Brill.

Jardine, Lisa. 1993. *Erasmus, Man of Letters: The Construction of Charisma in Print*. Princeton, N.J.: Princeton University Press, 1993.

Johns, Adrian. 1998. *The Nature of the Book: Print and Knowledge in the Making*. Chicago: University of Chicago Press.

Justi, Johann Heinrich Gottlob von. 1755. *Staatswirthschaft oder Systematische Abhandlung aller Oeconomischen und Cameral-Wissenschaften die zur Regierung eines Landes erfordert werden*, 2 vols. Breitkopf.

Kintzinger, Martin. 2000. "A Profession but Not a Career? Schoolmasters and the Artes in Late Medieval Europe." In *Universities and Schooling in Medieval Society*, edited by William J. Courtenay and Jürgen Miethke. Leiden: Brill.

Klinger-Dollé, Anne-Hélène. 2016. *Le De sensu de Charles de Bovelles (1511) Conception philosophique des sens et figuration de la pensée. Suivi du texte latin du De sensu, traduit et annoté*. Geneva: Droz.

Krämer, Fabian. 2014. *Ein Zentaur in London: Lektüre und Beobachtung in der frühneuzeitlichen Naturforschung*. Didymos-Verlag.

Kristeller, Paul Oskar. 1956. *Studies in Renaissance Thought and Letters*. Rome: Edizioni di storia e letteratura.

Lefèvre d'Étaples, Jacques. 1492. *Totius Aristotelis philosophiae naturalis paraphrases*. Paris: Johann Higman.

Lefèvre d'Étaples, Jacques. 1493. *Introductio in metaphysicorum libros Aristotelis*. Paris: J. Higman.

Lefèvre d'Étaples, Jacques. 1495. *Textus de sphaera Johannis de Sacrobosco, cum additione (quantum necessarium est) adiecta*. Paris: Wolfgang Hopyl.

Lefèvre d'Étaples, Jacques. 1496a. *Introductiones logicales*. Paris: Guy Marchant, 1496.

Lefèvre d'Étaples, Jacques. 1496b. *Arithmetica elementa; Musica elementa; Epitome in libros arithmeticos divi Severini Boetii; Rithmimachie ludus que et pugna numerorum appellatur*. Paris: Johannes Higman and Wolfgang Hopyl.

Lefèvre d'Étaples, Jacques. [c. 1502]. *Ars moralis in Aristotelis Ethica Nicomachea introductoria*. Deventer: Jacobus de Breda.

Lefèvre d'Étaples, Jacques. 1506. *Contenta. Politicorum libro octo. Commentarii. Economicorum duo. Commentarii. Hecatonmiarum septem. Economiarum publ. unus. Explanationis Leonardi [Bruni] in Oeconomica duo*. Paris: Henri Estienne.

Lefèvre d'Étaples, Jacques, editor. 1507. *Contenta. Theologia Damasceni*. Paris: Henri Estienne.

Lefèvre d'Étaples, Jacques. 1514. *Introductio in Physicam paraphrasim, adiectis annotationibus explanata*. Strassburg: Reinhard Beck.

Lefèvre d'Étaples, Jacques. 1516. *Introductiones logicales*. Strassburg: Johann Knoblauch.

Lefèvre d'Étaples, Jacques. 1535. *Decem librorum Moralium Aristotelis, tres conversiones*. Paris: Simon Colines.

Lefèvre d'Étaples, Jacques and Josse Clichtove. 1502. *Totius philosophiae naturalis paraphrases, adiecto commentario*. Paris: Henri Estienne.

Lefèvre d'Étaples, Jacques and Josse Clichtove. 1507. *Artificialis introductio per modum Epitomatis in decem libros Ethicorum Aristotelis adiectis elucidata commentariis, qui post primam editionem nonnullis additis, accessionem crementumque hac in secunda recognitione ceperunt*. Paris: Henri Estienne.

Lefèvre d'Étaples, Jacques and Josse Clichtove. 1511. *Artificialis introductio Iacobi Fabri Stapulensis in Decem Ethicorum libros Aristotelis; Adiuncto Familiari Commentario Iudoci Clichtovei declarata*. Strassburg: Johannes Groninger.

Lefèvre et al. 1507. *Introductio Iacobi Fabri Stapulensis in Arithmetica; Ars supputandi Clichtovei; Epitome rerum geometricarum Bovilli*. Deventer: Richardus Pafraet.

Le Goff, Jacques. 1993. *Intellectuals in the Middle Ages*. London: Wiley.

Leong, Elaine and Alisha Rankin, editors. 2011. *Secrets and Knowledge in Medicine and Science, 1500-1800*. Farnham: Ashgate.

Lohr, Charles H. 1988. *Latin Aristotle Commentaries: II Renaissance Authors*. Firenze: Leo S. Olschki.

Lucassen, Jan, Tine De Moor, and Jan Luiten van Zanden. 2008. "The Return of the Guilds: Towards a Global History of the Guilds in Pre-Industrial Times." *International Review of Social History* 53(S16): 5–18.

Lull, Ramon. 1505. *Contenta. Primum volumen Contemplationum Remundi duos libros continens. Libellus Blaquerne de amico et amato*, edited by Jacques Lefèvre d'Étaples. Paris: Guy Marchant for Jean Petit.

Mandosio, Jean-Marc. 2013. "Le *De magia naturali* de Jacques Lefèvre d'Étaples: Magie, alchimie et cabale." In *Les Muses secrètes: kabbale, alchimie et littérature à la Renaissance*, edited by Rosanna Camos Gorris, 37–79. Geneva: Droz.

Marr, Alexander, Raphaële Garrod, José Ramón Marcaida, Richard J. Oosterhoff. 2019. *Logodaedalus: Word Histories of Ingenuity in Early Modern Europe*. Pittsburgh: Pittsburgh University Press.

Massaut, Jean-Pierre. 1968. *Josse Clichtove, l'humanisme et la réforme du clergé*, 2 vols. Paris: Société d'Édition Les Belles Lettres.

Merchant, Carolyn. 1980. *The Death of Nature: Women, Ecology, and the Scientific Revolution*. New York: Harper & Row.

Michaud-Quantin, P. 1970. *Universitas: Expressions du mouvement communautaire dans le Moyen-Âge latin*. Paris.

Moé, Émile A van. "Documents nouveaux sur les libraires, parcheminiers et imprimeurs en relation avec l'Université de Paris à la fin du XV^e siècle." *Humanisme et Renaissance* 2: 5–25.

Moss, Ann. 1996. *Printed Commonplace-Books and the Structuring of Renaissance Thought*. Oxford: Clarendon Press.

De Munck, Bert. 2007. *Technologies of Learning: Apprenticeship in Antwerp Guilds from the 15th Century to the End of the Ancien Régime*. Turnhout: Brepols.

Oosterhoff, Richard J. 2015. "A Book, a Pen, and the Sphere: Reading Sacrobosco in the Renaissance." *History of Universities* 28(2): 1-54.

Oosterhoff, Richard J. 2017. "'Secrets of Industry' for 'Common Men': Charles de Bovelles and Early French Readerships of Technical Print," in *Translating Early Modern Science*, edited by Sietske Fransen, Niall Hodson, and Karl A.E. Enenkel, 207–29. Leiden: Brill.

Oosterhoff, Richard J. 2018. *Making Mathematical Culture: University and Print in the Circle of Lefèvre d'Étaples*. Oxford: Oxford University Press.

Post, Gaines. 1935. "Parisian Masters as a Corporation, 1200-1246." *Speculum* 9: 421–445.

Renaudet, Augustin. 1953 [1916]. *Préréforme et humanisme à Paris pendant les premières guerres d'Italie, 1494-1517*, 2nd ed. Paris: Édouard Champion.

Renouard, Antoine August. 1843. *Annales de l'imprimerie des Estienne; ou, Histoire de la famille des Estienne et de ses éditions*. Paris: J. Renouard et cie.

Renouard, Philippe. 1901. *Documents sur les imprimeurs, libraires, cartiers, graveurs, fondeurs de lettres, relieurs, doreurs de livres, faiseurs de fermoirs, enlumineurs, parcheminiers et papetiers ayan exercé à Paris de 1450 à 1600*. Paris: H. Champion.

Renouard, Philippe. 1965. *Répertoire des imprimeurs parisiens*, edited by Jeanne Veyrin-Forrer and Brigitte Moreau. Paris: M.J. Minard.

Richardson, Brian. 1994. *Print Culture in Renaissance Italy: The Editor and the Vernacular Text, 1470-1600*. Cambridge University Press.

Richardson, Brian. 2009. *Manuscript Culture in Renaissance Italy*. Cambridge: Cambridge University Press.

Rhenanus, Beatus. [1504.] Bibliothèque Humaniste de Sélestat [BHS], MS 58.

Rice, Eugene F., editor. 1972. *The Prefatory Epistles of Jacques Lefèvre d'Étaples and Related Texts*. New York: Columbia University Press.

Rouse, Richard H. and Mary A. Rouse. 1988. "The Book Trade at the University of Paris, ca. 1250- ca. 1350," in *La production du livre universitaire au Moyen Age : exemplar et pecia : actes du symposium tenu au Collegio San Bonaventura de Grottaferrata en mai 1983*, edited by Louis Bataillon, Bertrand G. Guyot, and Richard H. Rouse, 41–114. Paris: Editions du Centre national de la recherche scientifique.

Saenger, Paul. 1999. "Reading in the Later Middle Ages." In *A History of Reading in the West*, edited by Guglielmo Cavallo and Roger Chartier, translated by Lydia G. Cochrane, 120-148. Amherst, MA: University of Massachusetts Press.

Schreiber, Fred. 1982. *The Estiennes*. New York: E.K. Schreiber.

Schwinges, Rainer Christoph. "Student Education, Student Life." In *A History of the University in Europe, Vol. 1: Universities in the Middle Ages*, edited by Hilde de Ridder-Symoens, 195–243. Cambridge: Cambridge University Press.

Shapin, Steven. 1989. "The Invisible Technician." *American Scientist* 77(6): 554–563.

Shapiro, Adam. 2013. *Trying Biology: The Scopes Trial, Textbooks, and the Antievolution Movement in American Schools*. Chicago: University of Chicago Press.

Smith, Pamela H. 2000. "Vital Spirits: Redemption, Artisanry, and the New Philosophy in Early Modern Europe." In *Rethinking the Scientific Revolution*, edited by Margaret J. Osler, 119–136. Cambridge: Cambridge University Press, 2000.

Smith, Margaret M. 2000. *The Title-Page: Its Early Development 1460-1510*. London: Oak Knoll Press.

Tracy, James D. 1968. "Erasmus Becomes a German." *Renaissance Quarterly* 21(3): 281–88

Trithemius, Johannes. 1512. *De scriptoribus ecclesiasticis*. Paris: Bertold Rembolt and Jean Petit.

Tyler, Elizabeth Armstrong. 1952. "Jacques Lefèvre d'Étaples and Henri Estienne the Elder, 1502-1520." In *The French Mind: Studies in Honour of Gustave Rudler*, edited by W. Grayburn Moore, 17-33. Oxford: Sutherland and Starkis.

Vanautgaerden, Alexandre. 2012. *Érasme typographe: humanisme et imprimerie au début du XVIe siècle*. Geneva: Droz.

Verger, Jacques. 1992. "Patterns." In *A History of the University in Europe, Vol. 1: Universities in the Middle Ages*, edited by Hilde de Ridder-Symoens, 35–74. Cambridge: Cambridge University Press.

Veyrin-Forrer, Jeanne. "Simon de Colines, imprimeur de Lefèvre d'Étaples." In *Jacques Lefèvre d'Étaples (1450?-1536)*, Actes du colloque d'Étaples les 7 et 8 novembre 1992 edited by Jean-François Pernot, 97–117. Paris: Honoré Champion Éditeur, 1995.

Vicedo, Marga. 2012. "Introduction: The Secret Lives of Textbooks" [*Introduction to a Focus Section*], *Isis* 103(1): 83–87.

Victor, Joseph M. 1978. *Charles de Bovelles, 1479-1553: An Intellectual Biography*. Genève: Librairie Droz.

Wallis, Patrick. 2008. "Apprenticeship and Training in Premodern England," *The Journal of Economic History* 68(3): 832-861.

Waquet, Françoise. 2003. *Parler comme un livre: l'oralité et le savoir, XVIe-XXe siècle*. Paris: Albin Michel.

Warwick, Andrew. 2003. *Masters of Theory: Cambridge and the Rise of Mathematical Physics*. Chicago: University of Chicago Press.

Weijers, Olga and Louis Holtz, editors. 1997. *L'enseignement des disciplines à la Faculté des arts (Paris et Oxford, XIIIe-XVe siècles)*. Turnhout: Brepols.

White, Paul. 2013. *Jodocus Badius Ascensius: Commentary, Commerce and Print in the Renaissance*. Oxford: Oxford University Press.

Whitney, Elspeth. 1990. *Paradise Restored. The Mechanical Arts from Antiquity through the Thirteenth Century*, Transactions of the American Philosophical Society 80. Philadelphia, PA: American Philosophical Society.

Yeo, Richard. 2014. *Notebooks, English Virtuosi, and Early Modern Science*. Chicago: University of Chicago Press.