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ANATOMY OF A DISPUTE:  
LEONARDO, PACIOLI AND SCIENTIFIC COURTLY  
ENTERTAINMENT IN RENAISSANCE MILAN\*


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*Abstract*



Historians have recently paid increasing attention to the role of the disputation in Italian universities and humanist circles. By contrast, the role of disputations as forms of entertainment at fifteenth-century Italian courts has been somewhat overlooked. In this article, the Milanese “scientific duel” (a courtly disputation) described in Luca Pacioli’s *De divina proportione* is taken as a vantage point for the study of the dynamics of scientific patronage and social advancement as reflected in Renaissance courtly disputes. Pacioli names Leonardo da Vinci as one of the participants in the Milanese dispute. In this paper I argue that Leonardo’s *Paragone* and Pacioli’s *De divina proportione* are likewise the outcome of the Milanese “scientific duel.” By challenging the traditional hierarchy of the arts, they both exemplify the dynamics of social and intellectual promotion of mathematicians and artists in the privileged setting of Renaissance courts, where courtly patronage could subvert the traditional disciplinary rankings.



In 1496 the Dominican friar and mathematician Luca Pacioli was called to Milan by Duke Ludovico il Moro to offer public lectures on mathematics in the city.<sup>1</sup> In taking up his job Pacioli performed one of the roles assigned to mathematicians in the late fifteenth century. Italian Renaissance mathematical practitioners could be divided essentially into two disciplinary and professional categories: those who taught arithmetic and geometry, and those who taught astrology and astronomy. While in some cases universities offered chairs in arithmetic and geometry (“ad arithmetica et geometria”), more often these subjects were taught in the city’s public schools. This seems to have been the case in Milan, where figures like Pacioli—but also Fazio Cardano, father of the more

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<sup>1</sup> On Luca Pacioli, see S. A. Jayawardene, “Pacioli, Luca,” in *Dictionary of Scientific Biography*, X (1974), 269-272.

famous Girolamo—were hired to teach arithmetic and basic geometry.<sup>2</sup>

As Mario Biagioli noted in his study of Italian mathematicians, in the first half of the Quattrocento this disciplinary division translated into a marked difference in professional, social, and intellectual status. While the teaching of arithmetic and geometry was generally associated with the lower mechanical arts, the teaching of astrology and astronomy was related to the study and practice of medicine and natural philosophy.<sup>3</sup> Within the hierarchy of knowledge, the mathematician-astronomer-astrologer was thus close to the top.<sup>4</sup> The perceived difference in the nobility of their disciplines created a noticeable social, economical and professional disparity between the “celestial” mathematicians who engaged in astronomical studies, astrological prediction and astrological medicine, and the “terrestrial” mathematicians who dealt with book-keeping, land surveying and engineering.<sup>5</sup> Although by the

<sup>2</sup> The Duchy's *Studio* was located in the neighbouring city of Pavia. The Duke of Milan exerted direct control over the appointment and the salaries of the professors teaching at the *Studio*. Ludovico, however, maintained a separate school for rhetoric, poetry, Greek and mathematics in Milan. The salaries of those teaching in Milan were generally higher than those of the scholars teaching in Pavia. On the relationship between the Duke and the *Studio*, see Agostino Sottili “L'Università di Pavia nella politica culturale sforzesca,” in *Gli Sforza a Milano e in Lombardia e i loro rapporti con gli stati italiani ed europei (1450-1535)* (Milan, 1982), 519-581. On the *Studio*, see also Paul F. Grendler, *The Universities of the Italian Renaissance* (Baltimore-London, 2002), 82-93. On the Milanese teaching of Pacioli and Cardano, see Alfonso Corradi, *Memorie e documenti per la Storia dell'Università di Pavia e degli uomini più illustri che v'insegnarono*, 2 vols. (Pavia, 1877-1878), I: 162-165; and Sottili, “L'Università di Pavia,” 540-42. Sottili mistakenly speaks of a Francesco Cardano instead of Fazio Cardano.

<sup>3</sup> For a concise introduction to classical, medieval, and Renaissance astrology see Charles Burnett's excellent entry in F.A.C. Mantello and A.G. Rigg (eds.), *Medieval Latin: An Introduction and Bibliographical Guide* (Washington, D.C., 1996), 369-382.

<sup>4</sup> On the hierarchy of knowledge in the Renaissance, see the classic articles by Paul O. Kristeller, “The Modern System of the Arts. A Study in the History of Aesthetics,” *Journal of the History of Ideas* 12 (1944), 496-527; 13 (1945) 17-46.

<sup>5</sup> In what follows I use the terms “celestial” and “terrestrial” mathematician to indicate, respectively, those mathematicians who teach astrology and astronomy, and those who teach arithmetic and geometry. I borrow these expressions from Mario Biagioli's “The Social Status of Italian Mathematicians: 1450-1600,” *History of Science* 27 (1989), 42-43. The terms “astrologia” and “astronomia” were often used interchangeably in the Renaissance. For a discussion as to the origin and nature of such terms, see S. J. Tester, *A History of Western Astrology* (Woodbridge, Suffolk, 1987), 187; and Steven Vanden Broecke, *The Limits of Influence: Pico, Louvain, and the Crisis of Renaissance Astrology* (Louvain, 2003), ch. 1.

mid-sixteenth century one could trace a distinctive rise in the status of the teacher of arithmetic and geometry, in Pacioli's time we can assume that this social distinction was still relatively clear.<sup>6</sup>

Despite the fact that Pacioli's teaching took place in the city, his appointment and his remuneration were granted by the Duke. As a consequence, Pacioli was the beneficiary of courtly patronage and subject to the courtly dynamics of gift-giving and exchange that have been explored by social anthropologists, cultural historians and, more recently, historians of science.<sup>7</sup> As a way to celebrate and honor his new patron, a few years after his arrival in Milan Pacioli offered his next book, *De divina proportione*, to the Duke. Pacioli's token of gratitude to Ludovico was produced only in a small number of preciously illuminated presentation copies which were adorned with sixty geometric figures thought to have originally been drawn by Leonardo. Of the three presentation copies produced only two survive: a copy, dedicated to the Duke of Milan, is now preserved at the civic library of Geneva, and a second one, which Pacioli donated to Gian Galeazzo Sanseverino, is now at the Ambrosiana Library.<sup>8</sup>

*The Battle of the Books: Social Status and the Nobility of Scientific Disciplines at Court*

Pacioli's *De divina proportione* is far from being the book of technical mathematics and sophisticated calculations of the golden ratio that one might expect at first from a teacher of abacus. The beau-

<sup>6</sup> Biagioli ascribes this change to the professionalization of military engineering and the demand of professional mathematicians who could teach applied mathematics within Italian courts. See Biagioli, "The Social Status," esp. 44-46.

<sup>7</sup> The bibliography on court etiquette and courtly patronage is far too extensive to be summed up effectively here. On Italian courts besides the classic study by Lauro Martinez, *Power and Imagination: City-States in Renaissance Italy* (New York, 1979), esp. 218-240, see the bibliography indicated in the articles by Paula Findlen and William Eamon in Bruce T. Moran (ed.), *Patronage and Institutions: Science, Technology, and Medicine at the European Court 1500-1750* (Rochester, NY, 1991), 5-24, esp. n. 6; and 25-50, esp. n. 17; as well as in Mario Biagioli, "Galileo's System of Patronage," *History of Science* 28 (1990), 1-62; and idem, *Galileo, Courtier* (Chicago, 1993).

<sup>8</sup> A third one, now lost, was offered to Pietro Soderini. See Luca Pacioli, *De divina proportione*, introd. by Augusto Marinoni (Milan, 1982; facsimile edition of the ms at the Ambrosiana Library, Milan), esp. the prefatory note to the introduction. The manuscript was concluded by 1498. The first printed edition was published in Venice in 1509. See Marinoni's introduction, 5-18.

tiful illuminations that adorn its dedication page and the large folio size, together with the geometric figures designed by Leonardo, betray a much more ambitious scope. The first chapter of the work opens with a *commendatio* of the court of Milan and its illustrious members, which is followed by the praise of the court-sponsored projects of the horse monument in honor of Francesco Sforza and the fresco decoration of Santa Maria delle Grazie commissioned to Leonardo da Vinci, and it concludes with the *commendatio* of Pacioli's own work to the Duke.<sup>9</sup>

For its form and content, the opening chapter that constitutes Pacioli's dedicatory letter to the Duke warrants special attention. There, Pacioli recalls how in February 1498, Duke Ludovico assisted, at his Milanese residence in the Castle of Porta Giovia, at the performance of a laudable scientific duel ("scientifico duello"). Presumably the duel was staged as a disputation on the nobility of geometry and mathematics, a topic that features prominently in the opening chapters. Both lay and ecclesiastical personalities who tended to frequent his court accompanied the Duke.

From Pacioli's account it seems clear that this was a large-scale event that gathered together the most influential personalities of the time. After having reverentially mentioned some of the most prominent ecclesiastical figures, Pacioli quickly moves on to praise his "secular patron," Gian Galeazzo Sanseverino, *condottiere* of Ludovico's army, as a man "second to none in military prowess and a keen imitator of our own disciplines."<sup>10</sup> From this passage we can evince that although Pacioli received the patronage of the Duke of Milan, his broker at the time was Gian Galeazzo Sanseverino, who had probably acted as intermediary with the Duke to procure Pacioli his teaching job in Milan. It seems plausible also to infer that Sanseverino had a professional interest in mathematics and geometry and that he had personally pursued the study of these disciplines, possibly under the guidance of Pacioli himself.<sup>11</sup>

<sup>9</sup> Pacioli, *De divina proportione*, n. p.: "Commendatione dela sua Magnifica corte." The *commendatio* was a rhetorical form of praise that was widely used both in humanistic and scholastic writings. On the use of the *commendatio* in scholastic writings and university orations, see Jole Agrimi and Chiara Crisciani, *Edocere Medicos* (Naples, 1988), esp. 238-253.

<sup>10</sup> Pacioli, *De divina proportione*, fol. Iv: "[...] el R.<sup>do</sup> p. M. Francesco Busti al presente nel degno convento vostro de Milano regente deputato e de seculari prima *el mio peculiare patrone* S. Galeazo Sf. V. S. Severino fortissimo e generale de V. Cel.<sup>ne</sup> Capitano nellarmi hoggi aniuno secondo e de nostre discipline solerto immitatore." Emphasis mine.

<sup>11</sup> Pacioli's case thus constitutes an early instance of a tutor of mathematics

Pacioli's dedicatory letter contains much additional information on the circumstances of the duel and on the events that led him to write the book. Together with ecclesiastical personalities, courtiers, secretaries, and men of arms, Pacioli records the presence at court of "eminent orators, expert in the noble arts of medicine and astrology."<sup>12</sup> In order, these figures are: Ambrogio Varesi da Rosate, "famous scholar of Serapion and Avicenna, expert investigator of the celestial bodies and interpreter of future events"; Aloisio Marliani, "learned man who can cure any ailment"; Gabriele Pirovano, "keen observer of all matters related to medicine"; Nicolò Cusano, "who is estimated and venerated by all the aforementioned gentlemen in all those arts"; and, finally, Andrea Novarese, "very expert in the aforementioned professions."<sup>13</sup> Pacioli then briefly mentions the presence of illustrious doctors in law, secretaries and chancellors but without explicitly naming any of them. He concludes by introducing Leonardo da Vinci as one of the most illustrious participants.<sup>14</sup>

Remarkably, the praise of Leonardo's skills as a sculptor and painter takes up almost two pages of the manuscript. No other single figure receives nearly the same attention as Leonardo does. A large part of this praise is dedicated to Leonardo's equestrian monument to Francesco Sforza as well as to his frescoes at Santa

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that received the patronage of a man of arms interested in the applications of mathematics to military engineering and warfare technology. According to Biagioli, the introduction of new fortification techniques and new artillery (especially the cannon) "forced the *militēs*, the professional warriors of aristocratic origins, to begin to rely less on their horses and more on Euclid for the survival as a distinct social group." Although Biagioli does not discuss directly the *De divina proportione* and does not include Pacioli among those mathematicians who acquired a higher social status because of their courtly employment in the service of a *miles*, he situates this change within the period of Charles VIII's invasion of Italy in 1494. See Biagioli, "The Social Status," 44.

<sup>12</sup> Pacioli *De divina proportione*, fol. Iv.

<sup>13</sup> Ibid.: Ambrogio da Rosate "clarissimo et acutissimo de Serapione e Avicenna e de li corpi superiori indagatore e de le cose future interprete"; Aloisio Marliani "doctissimo de tutti mali curatore"; Gabriele Pirovano "solertissimo de la medicina in ogni parte observatore"; Nicolò Cusano "da li prefati molto in tutte premesse admirato e venerato"; and finally Andrea Novarese "peritissimo de medesime professioni." On some of these figures, see discussion below.

<sup>14</sup> The fact that Leonardo participated in a courtly disputation makes Badlesar Castiglione's use of the *paragone* debate in a courtly environment particularly suitable. See Castiglione, *Libro del Cortegiano*, I: xlxi-liii. As is well known, between 1490-1499, Castiglione was working in Milan at the service of Ludovico il Moro. It is thus plausible, albeit not certain, that his account reflects some of the events recounted by Pacioli.

Maria delle Grazie, two extremely prominent ducal commissions.<sup>15</sup> Who were the participants mentioned by Pacioli, and why did he go to the trouble of mentioning some of these people by name and not others? Is there some significance to the fact that we are told exactly who these “illustrious orators of medicine and astronomy” are? How does Leonardo fit into the picture? And why does he seem to take such a prominent role in Pacioli’s account?

In order to answer these questions, it is not only necessary to look more closely at the content of Pacioli’s treatise, but also at the contemporary relevance of the figures implicated in the duel as documented in the historical records. A study of the archival and historical sources pertaining to the court of Milan reveals that all these figures were extremely important representatives of Ludovico’s courtly entourage. Ambrogio Varesi da Rosate, Gabriele Pirovano, Nicolò Cusano and Aloisio Marliani were among the most acclaimed natural philosophers, doctors, astrologers, and scientific intellectuals at court. As the passing of time has relegated most of this figures to oblivion, it is only through an accurate reconstruction of their role at court that historians can assess fully the importance of the duel and the roles played in it by Pacioli and Leonardo.

Ambrogio Varesi da Rosate is probably the best-documented participant in the scientific disputation. The son of a physician who had moved to Milan to practise the medical profession, Ambrogio graduated in medicine at the *Studio* of Pavia in 1461 and by 1470 was already employed as court physician by Galeazzo Maria Sforza, brother of Ludovico and Duke of Milan from 1466-1476.<sup>16</sup> He rapidly ascended to power and prestige: by 1480 Ludovico il Moro assigned Varesi an annual salary of a hundred golden duc-

<sup>15</sup> Ibid., fol. IIr: “l’admiranda e stupenda equestre statua [...] ala Sanctissima invicta vostra paterna memoria dicata” and the “ligiadro de lardente desiderio de nostra salute simulacro, nel degno e devoto luogo de corporale e spirituale refectione del sacro templo dele gratie de sua mano penolegiato.”

<sup>16</sup> Numerous letters by Ambrogio are still preserved in the Archivio di Stato, Milan. One of these letters, dated October 1, 1470 documents that Ambrogio and another physician, Marco da Roma (who was later to abandon the profession and become an *editore* in Milan), had cured one of Galeazzo Sforza’s treasurers. See Archivio di Stato, Milan (henceforth ASMi), Autografi, Medici 219 (Varesi da Rosate, Ambrogio). See also Alberto M. Cuomo, *Ambrogio Varesi: Un rosatese alla corte di Ludovico il Moro* (Rosate, 1987), 14-15. On Marco da Roma and his scientific, devotional, and humanistic publications, see Arnaldo Ganda, “Marco Roma, sconosciuto editore dei prototipografi milanesi (1473-1477) e un nuovo incunabulo: il catalogo di vendita dei suoi libri,” *La Bibliofilia* 82 (1980), 97-129, 219-246.

ats by virtue of the “unique doctrine, integrity, and sincere faithfulness” that Ambrogio had demonstrated to his lord.<sup>17</sup> By 1491 Ambrogio made it into the highest political ranks of the Duchy, acquiring a title seldom held by a physician: on June 1, 1491 he was elected senatorial member of the *Consiglio Segreto* (the Privy Council), the most powerful government office of the Duchy.<sup>18</sup> Letters by Gabriele Pirovano, Aloisio Marliani, and Nicolò Cusano appear often in the correspondence of Duke of Milan.<sup>19</sup> I have found a wealth of letters signed by each of these physicians in the Milanese archives, most relating to the health of various members of the Duke’s extended family.<sup>20</sup> In order to give an idea of their prominence within the courtly environment and the trust that Ludovico placed in them, suffice it to say that in the 1480s-1490s Varesi, Cusano, and Pirovano were constantly at the bedside of Ludovico’s nephew Gian Galeazzo Maria Sforza (then, and until his death in 1494, the legal heir to the title of Duke of Milan),

<sup>17</sup> “Illustrissimus Dominus Lodovicus Maria Sfortia de Aragonia Patruus et Gubernator generalis noster carissimus superioribus diebus assignavit egregio Doctori Magistro Ambrosio de Rosate Phisico nostro dilecto Ducatos centum auri [...] pro honorantia ipsius officij, quod quidem preadictus Illuster Dominus Lodovicus ideo fecit ne singularis doctrina, integritas, ac sincera fides eiusdem Magistri Ambrosij omni ex parte destituta et aliquo honesto premio vacua videatur.” Transcription mine. This document is now preserved in the Private Archive of the Pisani-Dossi family in Corbetta, Milan (henceforth indicated as APD). I wish to thank Ms. Carola Pisani-Dossi for having allowed me to consult the material preserved in her family archive. The document, according to its most recent numeration, is in APD, filza 401, doc. n. 2 (dated Milan, November 26, 1480). See also Cuomo, *Ambrogio da Rosate*, 14-15, and 185 for a transcription of the document. Cuomo’s study includes the transcription of some of the letters preserved in the ASMi and some of the most significant documents in APD. Since the publication of his book, however, the archive has undergone a re-cataloguing process and his references have been superseded by the new numeration. There is no synoptic table that compares the old and new numerations, thus making Cuomo’s references of limited use to contemporary historians.

<sup>18</sup> APD, filza 401, doc. n. 11 (dated Pavia, June 1, 1491). See also Cuomo, *Ambrogio da Rosate*, 14-15, and 187 for the transcription of the document.

<sup>19</sup> Nicolò Cusano was physician and tutor to Ludovico’s young children. On him, see Monica Ferrari, “*Per non mancare in tuto del debito mio*”: *L’educazione dei bambini Sforza nel Quattrocento* (Milan, 2000). On Gabriele Pirovano, see Giancarlo Zanier, *La medicina astrologica e la sua teoria: Marsilio Ficino e i suoi critici contemporanei* (Roma, 1977), and Remo Catani, “Astrological Polemics in the Crisis of the 1490s,” in Jane Everson and Diego Zancani, *Italy in Crisis: 1494* (Oxford, 2000), 50. Pirovano’s *Defensio astronomia* was written in 1494, and printed in Milan in 1506. On some of these figures, see also Luigi Belloni, “La medicina a Milano fino al Seicento,” *Storia di Milano*, IX (1958), 596-696.

<sup>20</sup> These three figures are the subject of a forthcoming article that discusses in detail the figure of the court physician in Milan between ca. 1480-1499.



while Varesi and Marliani took care of, in turn, Ludovico's beloved wife Beatrice d'Este, and Ludovico's brother, Cardinal Ascanio Sforza.<sup>21</sup>

Not only were these learned physicians trusted members of the court but—at least in the case of Varesi and Pirovano—they were also the representatives of that class of “celestial” mathematicians practicing astrology and astronomy who considered themselves superior to scholars like Pacioli. While Pirovano is now better known for his role in the polemics over astrology he took up with Ficino and Pico della Mirandola, Varesi's reputation rested almost solely on his astrological predictions for the Duke.<sup>22</sup> We still possess some tables of ephemerides (astrological tables with the positions of the planets) from his *taquini*, together with some of the horoscopes drawn for the practice of judicial astrology, and some of his medical and political “predictions” for the Duke.<sup>23</sup>

It is interesting to note that an attentive reading of Pacioli's *De divina propoortione* reveals a rather subtle attack against those astrologers and astronomers who have insufficient knowledge of geometry and mathematics. Pacioli makes explicit reference to those astrologers who, in writing their astrological *taquini* and making their predictions, rely on the calculations of famous astrologers of the past such as Ptolomy, Albumasar, Alfraganus, Alphonsus de Castile, and Bianchinus. By relying on old calculations and not their own, these astrologers depended on data that was often incorrect, and they came up with predictions that were prob-

<sup>21</sup> See ASMi, Sforzesco, PS 1464; PS 1465, PS 1466; PS 1468; PS 1470; Autografi, Medici 216 (Marliani, Luigi); Autografi, Medici 217 (Pirovano, Gabriele); Autografi, Uomini Celebri, Scienziati e Letterati 124 (Cusani, Nicolò). Luigi Marliani was the cousin of Pietro Antonio Marliani, son of the more famous Giovanni Marliani. On Giovanni Marliani, see Marshall Clagett, *Giovanni Marliani and Late Medieval Physics* (New York-London, 1941). On the Marliani family, see ASMi, Giovanni Sitoni di Scozia, *Theatrum Genealogicum Familiarum Illustrium, Nobilium, et Civium Jnclytæ Urbis Mediolani*, fol. 285; and ASMi, Autografi, Medici 216.

<sup>22</sup> See Zanier, *La medicina astrologica* and Catani “Astrological Polemics.” On Varesi's reputation as Ludovico's chief astrologer, see also Julia M. Cartwright Ady, *Beatrice d'Este duchessa di Milano* (Milan, 1944-45), 54.

<sup>23</sup> One of the duties of court astrologers was to compile annual *taquini* with astrological predictions for the court. See Tester, *A History of Western Astrology*, 187; on astrological education at Italian universities, see Nancy G. Siraisi, *Medieval and Early Renaissance Medicine* (Chicago-London, 1990), 67-68; and Grendler, *The Universities*, 408-29. The term “judicial astrology” comprised natal, horary, and electional astrology. On the differences between these, see Sophie Page, *Astrology in Medieval Manuscripts* (Toronto, 2002), esp. 30-35. On Varesi's predictions, see especially ASMi, Autografi Medici, 219; and Sforzesco, Miscellanea 1569.

ably inaccurate and often damaging to those who followed them.<sup>24</sup> Given Varesi's fame as Ludovico's most trusted astrologer, it is possible to speculate that one of Pacioli's prime targets in the dispute was Ambrogio Varesi himself.

Be this as it may, the courtly scientific disputation presented the occasion for Pacioli to defend the nobility of mathematics as superior to all other arts and sciences, including astrology and astronomy, which—Pacioli argued—depended on the true principles of geometry. In the second and third chapters of the book Pacioli engages in a real “dispute of the arts.” His argument firmly hinges upon the idea that mathematics is necessary for a variety of other disciplines, not least the art of war, theology, philosophy, astrology, and law.<sup>25</sup> In the third chapter Pacioli challenges the traditional division of the four liberal arts of the *Quadrivium*, suggesting that they should be either reduced to three (*Arithmetica*, *Geometria*, and *Astronomia*) or enlarged to encompass five sciences, including music and *Prospectiva* (which for Pacioli embraces painting, *pittura*). Not only does Pacioli justify the presence of perspective within the *Quadrivium*, but argues that perspective is superior to music as it uses the nobler sense of vision.<sup>26</sup>—At this point, we must ask: how does Leonardo fit into this picture?

<sup>24</sup> Pacioli, *De divina proportione*, fol. VIIIr-v: “Non per altro e penuria de li boni astronomi se non per difetto de arithmetica, geometria, proportioni e proportionalita: e deli 10 li novi in lor iudicio se regano per Tavole, Tacuini e altre cose calculate per Ptholomeo, Albimasar, Ali Alfragano, Geber, Alphonso, Bianchino, Pro[s]docimo e altri li quali per la poca advertentia deli scriptori poseno essere maculate e vitiate e per consequente in quelle fidandose in grandissimi et videnti errori pervengano non con pocho danno e preiudicio de chi in lor se fidano.” On Ptolemy, Albumasar, Alfraganus (Al-Farghani), see Tester, *A History of Western Astrology*; *passim*; on Geber (Jabir ibn Hayyan)'s commentary of the *Almagest*, see Tester, *A History of Western Astrology*, 181; on Alfonso and the Alphonsine Tables, see “Emmanuel Poulle, “The Alphonsine Tables and Alfonso X of Castille,” *Journal for the History of Astronomy* 19 (1988), 97-113. On Prosdocimo de Beldomandi (Prosdocimus patavinus, Padua c.1370-1428) and Giovanni Bianchini (ca. 1400-ca. 1470), see Paul L. Rose, *The Italian Renaissance of Mathematics* (Genève, 1975), *passim*.

<sup>25</sup> On the study of mathematics for military purposes, see Pacioli, *De divina proportione*, fols. Vv-VIv, where Pacioli, in humanist fashion, brings both examples of antiquity and of the recent past. It is interesting to note that he mentions Francesco Sforza as an example of a *condottiero* who must have known his mathematics. For its importance for theology, see fol. VIIr; for its importance for natural philosophy, see fol. VIIr; for its significance for astrology, see quotation in n. 21 above; for its importance for law, see fol. VIIv; for its relevance to music, see fol. VIIIr; for its importance for perspective, cartography and cosmology, see fol. VIIIr.

<sup>26</sup> *Ibid.*, fol. VIIIv. It is significant that the only documented instance of the

*Subtle Geometries: Leonardo's Defense of Painting*

In his dedicatory chapter of the *De divina proportione*, Pacioli forcefully defends the certainty of mathematics and geometry against the “vague fables and other ridiculous and false *facetie* and also phony and incredible poetical inventions that are just hazy concepts that please the ear.”<sup>27</sup> He fails, however, to return to the theme of a possible comparison between poetical invention and geometry, and concentrates instead on other disciplines such as astrology, music and theology. The comparison between poetry and geometry, however, figures prominently in another work written around the same time by another attendant to the dispute, namely in Leonardo's *Paragone* of the arts. Although Leonardo seems to have left this treatise unfinished, his pupil and heir Francesco Melzi edited the work posthumously on the basis of Leonardo's notebooks.<sup>28</sup> In the *Paragone* Leonardo argues that painting, by being based on the prime principles of mathematics and geometry, is a *scientia*. “No human investigation may claim to be a true science,” Leonardo argues further,

if it does not pass through mathematical demonstrations; and if you would say that those sciences which begin and end in the mind possess truth, this is not conceded, but denied for many reasons. The foremost [reason] is that such mental discourses do not involve experience, and nothing renders certainty of itself without experience.<sup>29</sup>

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teaching of music at the university level was at Milan between 1494-1499, when Franchino Gaffurio was appointed by Ludovico “ad lecturam musicae” in the Milanese *studio*. See Franco A. Gallo, “La musica in alcune prolusioni universitarie bolognesi del XV secolo,” in *Sapere e/è potere: discipline, dispute e professioni nell'università medievale e moderna. Il caso bolognese a confronto* (Bologna, 1990), I: 205-215, at 205.

<sup>27</sup> Pacioli, *De divina proportione*, fol. IIIv: “faule anile ne altre ridicolose & false facetie ne anco mendaci e incredibili poetici inventioni le quale solo per un fume le orecchie paschano.”

<sup>28</sup> For a discussion of Leonardo's own authorial voice in the text, see my forthcoming article “In Praise of Art.”

<sup>29</sup> See Claire J. Farago, *Leonardo's Paragone* (Leiden, 1992), 178, with English translation at p. 179. The Italian reads: “Nissuna humana investigatione si pò dimandare vera scientia se essa non passa per le Mathematiche dimostrationsi. E se tu dirai che le scientie che principiano e finischano nella mente habbiano verita, questo non si concede, ma si niega per molte raggioni. E prima che in tali discorsi mentali non accade esperientia, senza la quale nulla dà di sè certezza.” On the “certitudo mathematicarum,” see also Paul L. Rose, “‘certitudo mathematicarum’ from Leonardo to Galileo,” in *Leonardo nella scienza e nella tecnica: atti del simposio internazionale di storia della scienza, Firenze, Vinci, 23-26 giugno 1969* (Florence, 1975), 43-49.

The role of experience, and painting's reliance on geometry, guarantees that painting is a "science." Moving from this principle, Leonardo then argues that painting, being based on the noblest sense of vision, is superior to all the other arts, and particularly poetry, which is based on the inferior sense of hearing.

There are numerous salient correspondences between Pacioli's and Leonardo's works.<sup>30</sup> Besides the obvious affinity regarding the foundation of every *scientia* on geometry, both texts contain an extensive defense of vision as the prince among the senses. For instance, while Pacioli refers to the eye as "the first door through which the intellect apprehends and judges," Leonardo argues in the *Paragone* that "the eye which is said to be the window of the soul, is the principal means by which *senso commune* may so copiously and magnificently consider the infinite works of nature, and the second way is the ear."<sup>31</sup> Likewise, whereas Pacioli argues that "of our senses, the wise believe sight to be the noblest," Leonardo sustains that "if the poet acts through the senses by way of the ear, the painter [does so] by way of the more worthy sense of the eye."<sup>32</sup> As evidence to the common genesis of the two works, it is important to note that Leonardo himself occasionally refers to astrology, this time to subordinate it to perspective, "the daughter of painting":

There is no part of astrology which is not the function of visual lines and perspective, the daughter of painting, because it is the painter who, by the necessity of his art, has given birth to perspective, in that painting can only be done with lines which enclose all the varied figures of bodies generated by nature.<sup>33</sup>

By arguing that the painter has invented perspective, and that astrology relies on perspective to operate, Leonardo clearly implies

<sup>30</sup> See Augusto Marinoni's introduction in Pacioli, *De divina proportione*, esp. 16-18, for similar remarks and further examples.

<sup>31</sup> Pacioli, *De divina proportione*, fol. Iv: "la prima porta per la qual l'intelletto intende e gusta." Farago, *Paragone*, 208-209 (§ 19): "l'occhio, che si dice finestra dell'anima, è la principal via donde il comune senso pò più cospicua et magnificamente considerare le infinite opere de natura, et l'orecchio è il secondo."

<sup>32</sup> Pacioli, *De divina proportione*, fol. Iv: "E deli nostri sensi per li savii el vedere piu nobile se conclude"; Farago, *Paragone*, 210-211 (§ 19): "se il poeta serve al senso per la via de l'orecchio, il pittore per la via del' occhio più degno senso."

<sup>33</sup> Farago, *Paragone*, 206-207 (§ 17): "Nissuna parte è nella astrologia che no' sia uffitio delle visuali e della prospettiva, figliola della pittura, perché il pittore è quello che, per necessita de la sua arte, ha partorito essa prospettiva, et non si pò fare per sè senza linee dentro le quali linee s'inchiudono tutte le varie figure de' corpi generati dalla natura."

that painting is superior to astrology—a very bold claim in the context of the traditional hierarchy of the disciplines.

If there are striking similarities between the *Paragone* and the *De divina proportione*, there are also, however, significant differences. For instance, Leonardo's *Paragone* is more attentive to the actual physiological process of sense perception, and it concentrates substantially on poetry, which Pacioli mentions only briefly in the beginning of the book.<sup>34</sup> It is possible to speculate that Pacioli had not engaged further with the subject precisely because somebody else (in this case Leonardo) had already disputed, or was about to, on that precise topic.

Why did Leonardo engage in a dispute of the arts that questioned the traditional hierarchy of the disciplines and place painting in the unlikely position of being a discipline superior to all the others? In an article written in 1962, Carlo Dionisotti suggested that Leonardo's defense of painting against poetry in his *Paragone* might have been a reply to a letter by the humanist poet Francesco Puteolano that openly spurned sculpture and painting as ever-lasting means to celebrate the deeds of Ludovico's father, Francesco Sforza. It seems possible that Leonardo was working on the horse monument already in the mid-to-late 1480s. When the letter was published in 1490, however, Ludovico was expressing some dissatisfaction with Leonardo's ability to complete the horse monument. This led Dionisotti to suggest that Leonardo wrote the *Paragone* as he was touched to the quick by this criticism.<sup>35</sup> The common genesis of Pacioli's *De divina proportione* and Leonardo's *Paragone*, Pacioli's own reference to the "phony and incredible poetical inventions that are just hazy concepts that please the ear," and Pacioli's distinguished praise of Leonardo's achievements in casting the horse monument and painting the Last Supper provide more conclusive evidence in support of Dionisotti's initial hypothesis.<sup>36</sup>

<sup>34</sup> See, for instance, Farago, *Paragone*, 198-205 (§ 15-16).

<sup>35</sup> Carlo Dionisotti, "Leonardo uomo di lettere," *Italia Medioevale e Umanistica* 5 (1962), 209-214. On the Sforza monument, see the recent collection of essays in Diane Cole Ahl (ed.), *Leonardo da Vinci's Sforza Monument Horse: The Art and the Engineering* (London, 1995).

<sup>36</sup> It may be worth noticing that Francesco Puteolano and Pacioli both taught in Milan at the city school sponsored by Ludovico. See Sottili, "L'Università di Pavia," 540-542.

*Crossing Boundaries: The Dispute as Means of Social Advancement*

Leonardo's *Paragone* has been often identified as the first treatise to maintain the superiority of painting over the other liberal arts and as a significant testimony to the newly acquired status of the artist in society.<sup>37</sup> In the *Paragone* Leonardo skillfully calls upon the supremacy of vision among the senses in order to argue for the superiority of painting over poetry, an art based on the lower sense of hearing.<sup>38</sup> Leonardo places sculpture, as an art based on vision but requiring more manual labour, as second in his hierarchy of the arts.<sup>39</sup> As Pacioli had done for mathematics, Leonardo defends the nobility of his discipline (which was generally associated with the mechanical arts), against the claims of another discipline.

As Biagioli and others have pointed out, it was outside the more traditional academic settings that new challenges to the traditional hierarchy of the disciplines could be launched.<sup>40</sup> The court, with its emphasis on spectacle and entertainment, represented a privileged space in which to wage such intellectual battles. Patronage could legitimate one's social status, and, accordingly, one's discipline. Patronage, at least in this case, had to be "won" in an authentic courtly duel.

From Pacioli's account, it is not clear if the other learned men he mentioned played an active role in the duel. It seems more likely that their function as spectators was to give respectability and prominence to the event and, indirectly, to Leonardo's and Pacioli's performance. Although we are not told explicitly who the opponents were, it is fairly clear that Pacioli was addressing himself to the astronomers present, and Leonardo most likely to poets like Puteolano that had questioned the value of sculpture and painting in celebrating the deeds of Francesco Sforza. As noted,

<sup>37</sup> For a recent example of such an interpretation, see Francis Ames-Lewis, *The Intellectual Life of the Early Renaissance Artist* (New Haven, 2000), especially the Introduction and chs. 6 and 7. Although both Cennino Cennini and L. B. Alberti argue that painting is based on the "science" of geometry and mathematics, none of them argues for the superiority of painting over the other disciplines. Alberti, instead, explicitly adheres to the Horatian motto "ut pictura poesis." See Giampiero Cammarota, "Fra Cinquecento e Seicento. Il mestiere del pittore e un primato discusso," in *Sapere e/è potere*, II: 239-242.

<sup>38</sup> On the physiology of vision, see also my discussion in "In Praise of Art."

<sup>39</sup> For Leonardo's discussion of sculpture, see Farago, *Paragone*, 256-281 (§ 35-45).

<sup>40</sup> See Biagioli, "Galileo's System of Patronage"; idem, *Galileo, Courtier*; and Bruce T. Morgan, "Introduction" in *Patronage and Institutions*, 1-4.

this would explain why Pacioli gave so much prominence to Leonardo's majestic horse monument and the decoration of the Last Supper in Santa Maria delle Grazie. While his opponents' argument stressed the ephemeral and unreliable nature of images when compared to words, Leonardo cleverly attempted to ground his argument in the natural philosophical principles of optics and human physiology.

By participating in the duel, Leonardo and Pacioli challenged the traditional hierarchy of disciplines and, at the same time, the social, economical and intellectual status that indissolubly came with it. In arguing for a higher social position for themselves and their disciplines, they attempted to gain new prestige and status outside the strict boundaries of university training and traditional education.

*Science and Spectacle: The Scientific Courtly Dispute as Courtly Entertainment*

How shall we interpret Pacioli's account in relation to courtly patronage? Is it possible to see disputation, and scientific disputation in particular, as a budding courtly practice of late fifteenth-century Italy? Can we interpret disputation as a common strategy for the establishment and consolidation of social, personal, and disciplinary hierarchies? In other words, was the Milanese scientific duel part of an emergent intellectual courtly practice that led to social advancement?

By the late fifteenth century, the practice of disputation had a venerable tradition.<sup>41</sup> Within Italian universities the scholastic disputation was an integral part of the educational curriculum, sanctioned by the university statutes.<sup>42</sup> There were prescribed times

<sup>41</sup> There is an extensive bibliography on medieval and academic disputations. The discussion that follows does not claim to offer a comprehensive treatment of the topic of academic, humanist and courtly disputations and their mutual relation. For bibliographical references and recent studies, see *Sapere e/è potere*.

<sup>42</sup> The bibliography on medieval universities and their statutes is much too extensive to be indicated here. For a general guide, see the classic study of Hastings Rashdall, *The Universities of Europe in the Middle Ages*, ed. Maurice Powicke and A.B. Emden (Oxford, 1936, reissued 1988), vols. 1 and 2. On Italian universities and the role of disputation, see Grendler, *The Universities*, 152-7. On the practice of disputation in Pavia, see *Statuti e ordinamenti della Università di Pavia dall'anno 1361 all'anno 1859* (Pavia, 1925). On public disputation and the college of physicians in Milan, see Aldo Bottero, "I più antichi Statuti del Collegio dei Medici di Milano" *Archivio Storico Lombardo*, a. 69, ns. 8 (1943), 72-112.

during the academic year when scholars were required to dispute publicly on their subjects, and the disputation was an integral part of the examination process that led to a degree in medicine or law. Both the academic inaugural oration and the more formal disputation often opened with a praise of the nobility and utility of one's discipline.<sup>43</sup>

The great popularity of this method of learning is testified by the great number of books of *quaestiones* that were written between the ninth and the sixteenth century on topics as varied as law, medicine, natural philosophy, and theology.<sup>44</sup> The studies of the written tradition by Nancy Siraisi, Brian Lawn, Jole Agrimi and Chiara Crisciani stress the importance of oral disputation as a main form of transmission of knowledge.<sup>45</sup> Interestingly, a scholar's reputation often rested on his ability to perform well in an academic dispute.<sup>46</sup>

By the late Trecento and the early Quattrocento, however, the practice of the disputation had moved out of the narrow circle of scholastic universities to find new forms and spaces in the writings of some of the most prominent humanists. As one looks closely at much of the intellectual production in fourteenth- and fifteenth-century Italy, one cannot fail to notice that a large amount of this output revolves around intellectual disputes. Among the earliest instances of humanist disputation one should mention Petrarch's "Invective against the Physician," his polemics against three Paduan Aristotelians in "On his Own Ignorance and that of Others," and his attack on dialectic in "Disapproval of an Unreasonable Use

<sup>43</sup> For an example of an inaugural oration of this kind, see N. M. Swerdlow, "Science and Humanism in the Renaissance: Regimontanus's Oration on the Dignity and Utility of the Mathematical Sciences," in Paul Horwich (ed.), *World Changes: Thomas Kuhn and the Nature of Science* (Cambridge, Mass., 1993), 131-168. For earlier examples as pertains to medicine, see the *Sermo* of Gentile da Foligno and the *Oratio* of Iacopo da Forlì in Agrimi and Crisciani, *Edocere medicos*, 237-273. Unfortunately, to date there are no comprehensive studies of this rich academic genre.

<sup>44</sup> See Brian Lawn, *The Rise and Decline of the Scholastic "Quaestio disputata"* (Leiden-New York, 1993).

<sup>45</sup> Brian Lawn, *The Salernitan Questions* (Oxford, 1963); and idem, *The Rise and Decline*, 1993. On the method of teaching in medieval medical schools, see also Agrimi and Crisciani, *Edocere medicos* 1988, esp. ch. 4.

<sup>46</sup> One case in point is the physician Ugo Benzi da Siena, who seems to have made a name out of his extraordinary ability to win out arguments in public scholastic disputations. See Dean P. Lookwood, *Ugo Benzi: Medieval Philosopher and Physician, 1376-1439* (Chicago 1951), esp. Introduction, 1-18 and the "Vita Ugonis," 19-32. See also Nancy Siraisi, *Taddeo Alderotti and his Pupils: Two Generations of Italian Medical Learning* (Princeton 1981), 238-268.



of the Discipline of Dialectic.”<sup>47</sup> But possibly the most significant example of the appeal of disputation to early Renaissance humanists remains Coluccio Salutati’s *De nobilitate legum et medicinae*, a dispute on the superiority of law over medicine written in reply to the writings of the physician Bernardo da Florentia.<sup>48</sup>

Not only did the humanists’ belief in the utility of disputation translate into works of this kind, but it was also openly acknowledged in one of the early manifestos of humanism, Leonardo Bruni’s dialogue “Ad Petrum Paulum Histrum.” In his dialogue Bruni makes Coluccio Salutati argue passionately for the importance of disputation for humanist studies.<sup>49</sup> Interestingly, Salutati appears also as one of the characters in Giovanni da Prato’s *Il Paradiso degli Alberti*, where da Prato fictionalizes the meetings and discussions of Salutati and his friends with prominent natural philosophers such as Marsilio di Santa Sofia and Biagio Pelacani.<sup>50</sup> Both Leonardo’s *Paragone* and Pacioli’s *De divina proportione* proceed often dialogically and seem to have preserved some of the elements of the scholastic *disputatio* that characterized university disputes while at the same time incorporating much of the rhetorical elements characteristic of humanistic writings.<sup>51</sup>

Numerous other literary disputes could be mentioned: of par-

<sup>47</sup> Francesco Petrarca, *Invective contra medicum: testo latino e volgarizzamento di ser Domenico Silvestri*, edited by Pier Giorgio Ricci (Roma, 1978) and the writings of Petrarch in J. H. Randall, P. O. Kristeller, and E. Cassirer, *The Renaissance Philosophy of Man: Petrarca, Valla, Ficino, Pico, Pomponazzi, Vives* (Chicago, 1950). On Petrarch’s invectives, see also P.O. Kristeller, “Petrarch’s “Averroists”: A Note on the History of Aristotelianism in Venice, Padua, and Bologna,” *Bibliothèque d’Humanisme et Renaissance* 14 (1952), 59-65; and Nancy Struever, “Petrarch’s *Invective contra medicum*: An Early Confrontation of Rhetoric and Medicine,” *Modern Language Notes* 108 (1993), 659-679.

<sup>48</sup> See Coluccio Salutati, *De nobilitate legum et medicinae*, ed. E. Garin (Florence, 1947); and Giulio F. Pagallo, “Nuovi testi per la “Disputa delle arti” nel Quattrocento: la “Quaestio” di Bernardo da Firenze e la “Disputatio” di Domenico Bianchelli,” *Italia Medioevale e Umanistica* 2 (1959), 467-82. On Salutati’s work, see also Ronald G. Witt, *Hercules at the Crossroads. The Life, Works, and Thought of Coluccio Salutati* (Durham, NC, 1983), pp. 331-345.

<sup>49</sup> Neal W. Gilbert, “The Early Italian Humanists and Disputation,” in *Renaissance Studies in Honor of Hans Baron*, eds. A. Molho and J. A. Tedeschi (DeKalab, Illinois, 1991), 203-226.

<sup>50</sup> On Salutati’s knowledge of late medieval physics, see Ronald G. Witt, “Salutati and Contemporary Physics,” *Journal of the History of Ideas* 38 (1977), esp. 668-669. If we take the literary representations of the figure of Coluccio Salutati to reflect actual events, one can presume that at least some of these accounts may have reflect real events that happened in a lively intellectual circle of friends.

<sup>51</sup> On the scholastic elements of the *Paragone*, see my discussion in “In Praise of Art.”

ticular significance are the early disputes on the nobility of the various arts (medicine and law, but also arms and letters) collected by Eugenio Garin, as well as the disputes on the value and nature of classical imitation between Quattrocento and Cinquecento humanists studied by Martin McLaughlin.<sup>52</sup> At least in one of these numerous cases—the impassioned quarrel between Poliziano and Giorgio Merula—the tone of the dispute became so charged as to require the intervention of the Milanese ducal secretaries, Jacopo Antiquario and Bartolomeo Calco, and ultimately of Ludovico himself.<sup>53</sup>

It is significant to notice that by the late Quattrocento, some of the most notable disputes revolved around scientific topics. At least two of these scientific disputations have been studied in detail: the medical dispute between Nicolò Leonicensi, Sebastiano dall'Aquila, and Coradino Gilino on the French Disease; and the dispute between Angelo Poliziano, Nicolò Leonicensi, Ermolao Barbaro and Pandolfo Collenuccio on Pliny.<sup>54</sup> Although both disputes were later immortalized in print in the form of letters and treatises, the first of them seems particularly significant here as it took place in a court setting.

<sup>52</sup> The earlier disputes are collected in Eugenio Garin, *La disputa delle arti nel Quattrocento* (Florence, 1982), while the latter disputes are examined in Martin McLaughlin, *Literary Imitation in the Italian Renaissance: The Theory and Practice of Literary Imitation in Italy from Dante to Bembo* (Oxford, 1995), 126-146; 187-227; 228-248, 249-276. Since Garin's study appeared, there has been a wealth of articles dedicated to the genre of the "disputa delle arti" in its intellectual and social contexts. Some of the most valuable contributions to the topic are collected in the conference proceedings *Sapere e/è potere*. In vol. 1 (*Forme e oggetti della disputa delle arti*), see specifically the contributions of Jean Jacques Marchand, Francesco Tateo, and Lucia Cesarini Martinelli; in vol. 2 (*Verso un nuovo sistema di sapere*), see particularly the articles of Cesare Vasoli, Andrea Cristiani, Franco A. Gallo, Paolo Gozza, and Giampiero Cammarota.

<sup>53</sup> See *Storia di Milano*, VIII: 588-596. The correspondence between Merula and Poliziano, and between the two humanists and the court of Milan, has been collected and discussed in F. Gabotto and A. Badini-Gonfalonieri, *Vita di Giorgio Merula* (Alessandria, 1893). On the polemic between Merula and Poliziano, see also Mario Santoro, "La polemica Poliziano-Merula," *Giornale Italiano di Filologia* 5 (1952), 212-233.

<sup>54</sup> On the French Disease, see J. Arrizabalaga, J. Henderson, and R. French, "The Medical Dispute at the Court of Ferrara," in *The Great Pox: The French Disease in Renaissance Europe* (New Haven-London, 1997), 56-87; on Pliny, see Giovanna Ferrari, *L'esperienza del passato: Alessandro Benedetti filologo e medico umanista* (Florence, 1996), 175-250; and Peter Godman, *From Poliziano to Machiavelli: Florentine Humanism in the High Renaissance* (Princeton, 1998), ch. 3, esp. 96-112. On Leonicensi's medical disputes, see also Daniela Mugnai-Carrara, "Una polemica umanistico-scolastica circa l'interpretazione delle tre dottrine ordinate di Galeno," *Annali dell'Istituto e Museo di Storia della Scienza di Firenze* 8 (1980), 31-57.

The medical dispute between Leoniceno, dall'Aquila, and Gilino seems to have originated at the court of Ferrara, where the Duke summoned his finest physicians in order to debate—in the form of a disputation—on what was the best way to treat the French Disease. Although “this was the accepted method of generating and validating knowledge in the university,”<sup>55</sup> in this instance, as in the Milanese case, the disputation was brought into a new intellectual arena, namely the Renaissance court, and used as a form of spectacle and learned entertainment. As such, a court disputation differed in significant ways from an academic one.<sup>56</sup> Unlike scholastic disputations, patronage played a central role in courtly disputes.<sup>57</sup> While the universities of the Renaissance tended to promote conservative views, it was at court where unconventional ideas and new theories could circulate more freely and intellectual and social reforms were made possible. In the case of the Ferrarese dispute, Leoniceno's medical Hellenism, with his return to the *prisca doctrina* of the ancient Greeks represented the unconventional position.<sup>58</sup>

Like the “duello scientifico” in Milan, the Ferrarese medical dispute was held in a ducal palace.<sup>59</sup> It took place around March or April 1497. It was not the first of such events: the Dukes of Ferrara had previously organized some theological disputes in 1477, 1487, and 1488.<sup>60</sup> This time, however, the subject was medical. A number of men met, including the university professors Nicolò Leoniceno and Sebastiano dall'Aquila, and the court physician Coradino Gilino.

Unfortunately, no archival documentation of the event survives. As in the case of Milan, however, we know the content of the dispute and the name of the participants from the ensuing writings

<sup>55</sup> Arrizabalaga, Henderson and French, “The Medical Dispute,” 56. See also my comments on the importance of scholastic *disputatio* in late medieval and Renaissance culture in “In Praise of Art.”

<sup>56</sup> Previous scholars had tended to concentrate on the academic dispute generated in Bologna following Leoniceno's publication of his theories. See Arrizabalaga, Henderson and French, “The Medical Dispute,” 57.

<sup>57</sup> *Ibid.*, 58, and *passim*.

<sup>58</sup> *Ibid.*, 56, and *passim*.

<sup>59</sup> In dedicating his work to his protector and patron Lodovico Gonzaga, Sebastiano dell'Aquila wrote: “I have decided to report to you what has been disputed on the disease which people call the “French Disease” *at the house of our princes* during the past days.” Quoted in Arrizabalaga, Henderson and French, “The Medical Dispute,” 58. Emphasis mine.

<sup>60</sup> *Ibid.*

of some of the participants. It is significant that each one of the participants addressed his work to a different patron.<sup>61</sup> The effort to win medical authority over the difficult issue of the causes and cures for the French Disease was thus indissolubly intertwined with issues of patronage and personal gain. Interestingly, the patronage network extended further than the three participants. For instance, around 1498 the young Ludovico Ariosto wrote a letter in praise of dall'Aquila's lectures on Plato's *Timaeus*, while the ducal heir Alfonso asked his father to protect dall'Aquila, who had been recently assailed. In addition to this, the wife of a Mantuan courtier had recommended dall'Aquila's services to Isabella d'Este, who was looking for a doctor for her sculptor Gian Cristoforo Romano. And finally, there were the praises of the humanist courtier Giovanni Sabatino degli Arienti to Ercole d'Este.<sup>62</sup>

It is not too difficult to recognize some parallels between the praise received by dall'Aquila in relation to the courtly dispute and the similar praise that Leonardo attracted for his horse monument from courtly poets such as Piattino Piattini, Bernardo Bellincioni, as well as friends like Pacioli.<sup>63</sup> It seems obvious that both instances reveal an analogous system of patronage based on intermediaries and brokers who would "promote" a particular participant in the dispute.

Seen in this light, Leonardo's famous fictional account of a dispute between a poet and a painter at the court of Matthias Corvinus in chapter 27 of the *Paragone*, despite the exotic location in which it is set, may be interpreted as a faithful representation of a real event, and transmits the sense of what it was like to compete for patronage in a courtly setting. In other words, it can be read as

<sup>61</sup> Leonico addressed his work to Gianfrancesco Pico della Mirandola, dell'Aquila to Lodovico Gonzaga, and Gilino to Sigismondo d'Este. See Arrizabalaga, Henderson and French, "The Medical Dispute," p. 59-60.

<sup>62</sup> For these circumstances, see Arrizabalaga, Henderson and French, "The Medical Dispute," 67-68.

<sup>63</sup> On Piattino's poems, see Evelyn Welch, *Art and Authority in Renaissance Milan* (New Haven, 1995), 200; on Bellincioni and his collaboration with Leonardo, see Edmondo Solmi, "La festa del Paradiso di Leonardo da Vinci e Bernardo Bellincioni (13 Gennaio 1490)," *Archivio Storico Lombardo* 31, ser. IV (1904), 75-89; and the catalogue of the exhibition M. Mazzocchi Doglio, G. Tintori, M. Padovan, M. Tiella (eds.), *Leonardo e gli spettacoli del suo tempo* (Milano, 1983). See also Martin Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man* (London, 1981), 152-168; on his poems, see Eugenio Garin, "La cultura milanese nella seconda metà del XV secolo," in *Storia di Milano*, VII, pt. 4 (Milano, 1956), 539-597, esp. 586-587.

a form of testimony to what was becoming a common practice at court: the courtly dispute. These events—whose topic could range from theology to art, from mathematics to medicine—ultimately served both as courtly entertainment and as springboards for self-promotion.

### *Conclusions*

The academic disputation was a constant, statutory feature of Italian universities from the very moment of their foundation. From the late fourteenth century, however, the disputation concerning the nobility of one's particular discipline became a genre of its own, which achieved increasing popularity among humanists and natural philosophers alike. By the end of the fifteenth century, though, the genre acquired a new format, that of the courtly dispute. Almost unfailingly, these disputes seem to have resulted in the production of polemical texts. Furthermore, as in the case of Pacioli and the Ferrarese physicians, the letters of dedication of some of their writings allow us to infer that they were written and produced for courtly consumption and geared towards the acquisition of privileges and the consolidation of patronage relationships.

Whereas scholastic, humanistic, and courtly disputes show common features, there are elements of the courtly dispute that seem to set it apart from the other two types. What makes the Milanese and Ferrarese disputes different from all the others is courtly patronage. Under the aegis of Duke Ludovico, Leonardo and Pacioli attempted to raise the status of their disciplines and to acquire a new economic and social status that was generally denied to members of their profession. Significantly, both in Ferrara and in Milan, the dispute acquires the vestiges of courtly entertainment. As such, it involves courtiers and intellectuals, academicians and craftsmen, subtly crossing the conventional boundaries of fifteenth century Italian court hierarchies, and allowing for the subversion, permissible only by the Duke's willingness to grant patronage, of the social order of Renaissance society.

Biagioli's study of Galileo certainly provides positive evidence of Galileo's crafty use of disputation for social and intellectual promotion at the Medici court in the sixteenth century. Scholars, however, have paid only limited attention to early instances of scientific patronage at court. In order to fully assess the role of



patronage in science in the sixteenth-century, it seems essential to historicize these instances further by looking closely at the earlier period. In this respect, more studies of Quattrocento scientific patronage are needed that can provide us with the historical framework on which Biagioli's case rests.

