

## The Scaliger-Cardano debate revisited

Many people have been drawn to comment on the debate between Scaliger and Cardano over the *De subtilitate*. It was one of the polemics of its day most commented upon over the century following its occurrence, for a variety of reasons, some to do with debates within neo-Aristotelianism, some to do with the development of natural philosophy, some to do with pedagogy in reformed and Lutheran universities. It was still of interest to Pierre Bayle and his contemporaries practising *historia literaria* in the late seventeenth century.<sup>1</sup> In 1982, I discussed it in the context of a much later but equally energetic polemic over the history of the new science of the seventeenth century and the different theories about its relationship to the intellectual outlooks of various groups of medieval and early modern thinkers. Brian Vickers brought together a range of scholars to examine his own strong views in this debate about the distinction between occult and scientific mentalities, in the light of the accounts published by Lynn Thorndyke and Frances Yates on a range and importance of modes of occult thought, including magic and natural magic, hermeticism, neoplatonism, irrationalism, demonology, cabbala, mysticism, numerology, alchemy, astrology, and divination. Vickers characterised these modes of thought as analogical, and denied that they had anything to do with the emergence of the new science.<sup>2</sup>

In my own contribution to this conference, I examined the different senses of subtlety espoused by Cardano and Scaliger, one being a sensible and intelligible *ratio* or relation between substances, accidents, and representations; the other locating subtlety in the human mind as a faculty; this distinction being clearly close to the realism-nominalism debate and the sharp distinction made between nature and human perception of nature.<sup>3</sup> I set out to

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<sup>1</sup> Pierre Bayle, *Dictionnaire historique et critique*, Rotterdam, Reinier Leers, 1697, pp. 761-67, at 767.

<sup>2</sup> *Occult and Scientific Mentalities in the Renaissance*, ed. Brian Vickers, Cambridge: Cambridge University Press, 1984, pp. 1-55, 95-163.

<sup>3</sup> A helpful analysis of the differences between Cardano and Scaliger relating to the term 'subtilitas' is to be found in Rodolphus Goelenius, *Analyses in excitationes aliquot Julii Caesaris Scaligeri, de Subtilitate, quae e*

relate what both thinkers had to say to the wider context of their writings, and to their chosen modes of argumentation, which were explicitly rhetorical in the case of Scaliger, but not in the case of Cardano, although I permitted myself to suggest that his were also rhetorical in so far as he engaged in persuasion and non-apodictic (topical) argument. In this account, the thought of Cardano came out as a version of Aristotelianism (in spite of Cardano's claim that he was replacing the Aristotelian paradigm), with elements of numerology and an apparently arbitrary or at the very least speculative revision of fundamental natural philosophy. Scaliger came across as a representative of humanistic science with a tendentious version of Aristotelianism. I claimed that both belonged to the same 'universe of discourse'. The question that I did not attempt to resolve was that relating to the conscious intellectual commitments of Cardano and Scaliger. The former certainly thought that there was a difference in mental *habitus* that separated him from his opponent, and expressed this in a very explicit way in his rebuttal of the fifteenth book of the *Exotericarum exercitationum*, entitled the *Actio prima*. I also did not address directly the Vickers thesis about the occult, except to associate it with a paradoxical approach to the revelation of arcane knowledge; and so I did not enquire into whether it might be considered reasonable or even 'scientific' in this period to believe in the influence of the stars, and to attempt to find out about the future by using one or another version of astrology.<sup>4</sup>

I also did not spend time examining what the English philosopher Collingwood called 'absolute presuppositions'; that is, intellectual commitments that are determinable by subsequent historians but invisible to the thinkers of a given age (many might invoke

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*dictantis ore exceptas Philosophiae studiosis exhibet et communicat M. Johannes Schroderus Suecus*, Marburg, Paulus Egenolphus, 1599.

<sup>4</sup> Ian Maclean, 'The Interpretation of Natural Signs: Cardano's *De subtilitate* versus Scaliger's *Exercitationes*', in *ibid*, pp. 231–52. For the reasonableness or otherwise of astrology, see the seminal humanist work by Giovanni Pico della Mirandola (1463–94), *Disputationes adversus astrologiam divinatricem*, and Anthony Grafton, *Cardano's Cosmos: The Worlds and Works of a Renaissance Astrologer*, Cambridge, MA: Harvard University Press, 1999.

Foucault's episteme rather than Collingwood at this point).<sup>5</sup> And in my examination of commitments that they were aware of, I did not attempt explicitly to relate these to some of the available theories of how they operated, such as Kuhn's paradigm and the mentalité of the Annales School.<sup>6</sup> In later studies, I tried to do this by addressing the disciplinary specificity of such modes of thinking, in relation to jurists and medical doctors.<sup>7</sup> I have come to believe that there is such a thing as to 'think like a medieval or Renaissance lawyer or doctor', and that it relates closely to the forms of mental training that such figures underwent, that they were able to describe in various ways, including by the use of the word 'habitus'. The Italian jurist Bartolus, for example, saw the ability of both groups to adapt universals to individual cases as their specific 'habitus': speaking of the 'prudens iurista vel medicus', he claims that 'he has acquired through his past practice a 'habitus' of adapting universals to particulars by the use of right reason.'<sup>8</sup> Equally, a new vision of students of the ancients emerged whom Theodor Zwinger came (after Valla and Poliziano) to describe as 'philologi', who approached the ancient world with more analytical tools and a greater sense of history.<sup>9</sup> Both Cardano and Scaliger are clearly implicated in these new modes of thinking, as I hope to show.

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<sup>5</sup> On this, see Ian Maclean, *Le monde et les hommes selon les médecins de la Renaissance*, Paris, CNRS Editions, 2006, pp. 111-21.

<sup>6</sup> For a summary account of these theories, see id., 'The process of intellectual change: a post-Foucauldian hypothesis', *Arcadia*, 33 (1998) 168-81.

<sup>7</sup> *Interpretation and meaning in the Renaissance: the case of law*, Cambridge, Cambridge University Press, 1992; *Logic, signs and nature in the Renaissance: the case of learned medicine*, Cambridge, Cambridge University Press, 2001.

<sup>8</sup> Cited inter alios by Gianna Pomata, 'Sharing Cases: the Observations in early modern medicine', *Early science and Medicine*, 15 (2010), 193-239, at 231: 'prudencia consistit circa particularia et ea, quae contingentur eveniunt, ut intra se consiliari et disputare et recta ratione universalia particularibus occurrentibus applicare (...) Est enim prudentia habitus et sic patet, quod requiruntur frequentati actus; unde licet constat aliquem esse magnum iuristam vel medicum, non tamen sequitur ergo est prudens iurista vel medicus. Ad hoc enim requiritur quod per practicam precedentem habitum fecerit ad adaptandum universalia particularibus et hoc recta ratione' (Bartolus, *Tractatus Testimoniorum*, section 73, quoted from Susanne Lepsius, *Der Richter und die Zeugen. Eine Untersuchung anhand des Tractatus testimoniorum des Bartolus von Sassoferrato*, Frankfurt am Main, Vittorio Klostermann, 2003, pp. 282-3.

<sup>9</sup> Theodor Zwinger, *Theatrum humanae vitae* (1586), Basel, 1604, l.sig.):( ):( 2r-3r, summarized by Rodolphus Goclenius, *Lexicon philosophicum graecum*, Marburg, Frankfurt, 1613, pp. 257-8: 'philologi etiam a nonnullis dicuntur, tum qui Organicorum philosophiae grammaticae logicae rhetoricae et poeticae praecepta et exempla congerunt: tum qui non ex uno genere sed ex Encyclopaedia scientiarum tanquam apes sedulae ex variis flosculis, elegantiae methodique mella fragrantissima colligunt.' Zwinger may well have had in minds scholars

Before turning to their polemic, I should like to add one word about the scholarship on Cardano and Scaliger. In the first case, a great deal has been written since 1999 on his medical thought, astrology, ethics and natural philosophy to which I shall make appropriate reference<sup>10</sup>; most recently, Guido Giglioni has written an article on the Cardano-Scaliger debate which in many ways is complementary to what I shall write here.<sup>11</sup> As well a useful account of the various strategies adopted by both authors to justify their engagement in, and exercise of, polemic (the need to promote truth by productive debate), he sets out a range of the differences between the two in the conceptual fields of nature, thought and language. These are addressed here from a rather different angle. Giglioni feels able to comment on the intimate psychological motivation for the stances of the two writers ('a provocateur [...] a paranoid'), where I have restricted myself here to a 'habitus' of mind that was explicitly recognized by both writers.<sup>12</sup>

In the case of Scaliger, I should like briefly to refer to the work of Kristian Jensen, Michel Magnien, Pierre Lardet and Kuni Sakamoto. Magnien concentrates on his relationship with his publishers, and the philological commitments and the quality of his work.<sup>13</sup> For Jensen, Scaliger aspires to be considered a 'great philosopher'; he shows that Scaliger's Ciceronian humanism was compatible with scholasticism, and that he adopts a rhetorical philosophy over syllogistic (leading to the criticism that he was 'not strict enough with

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such as Lorenzo Valla and Angelo Poliziano. The adjective 'organici' refers to the *Organon*, or Aristotelian instrument of knowledge.

<sup>10</sup> See especially the two collections of essays edited by Guido Canziani and Marialuisa Baldi: *Cardano: le opere, le fonti, la vita*, Milan: FrancoAngeli, 1999, and *Cardano e la tradizione dei saperi*, Milan: FrancoAngeli, 2004. Two further major studies are those by Grafton, *Cardano's Cosmos*, and Nancy G Siraisi, *The Clock and the Mirror: Girolamo Cardano and Renaissance Medicine*, Princeton, NJ: Princeton University Press, 1997.

<sup>11</sup> 'Scaliger versus Cardano versus Scaliger', in *Forms of conflict and rivalries in Renaissance Europe*, ed. David. A Lines, Marc Laureys and Jill Kraye, Bonn: Bonn University Press, 2015, pp. 110-130.

<sup>12</sup> *Ibid.*, p. 128.

<sup>13</sup> **Error! Main Document Only.** Michel Magnien, 'Un humaniste face aux problèmes d'édition: Jules-César Scaliger et les imprimeurs', *Bibliothèque d'Humanisme et Renaissance*, 44 (1982), 307-29.

words’).<sup>14</sup> Pierre Lardet considers Scaliger as an unconventional thinker on grammar and language.<sup>15</sup> Kuni Sakamoto’s approach is to look at Scaliger in the context of both philosophy and theology. His Aristotelianism is said to be conditioned by the Scotist, anti-naturalistic influences in the Padua of his youth, and the need to establish their compatibility with Christian metaphysics (especially the doctrines of the creation and the Trinity). This approach puts him on the side of those who opposed hylomorphism, and could thereby be seen as precursors of the mechanical philosophy of the later seventeenth century.<sup>16</sup> These recent trends in scholarship suggest that it would be useful to ask how Scaliger and Cardano in their different ways divide the field of knowledge of their day. For example, Cardano (among others) makes a very clear distinction between a lower form of activity, both institutionally and conceptually, which he calls ‘grammar’ and a higher form which is found especially in three disciplines, medicine, natural philosophy and mathematics: his own efforts were located ‘not in the vapid logical debates that suffices in the schools of dialecticians and sophists, but in solid study and experiment. In our university, a professor of dialectic or metaphysics is hired for twenty crowns; a professor of medicine or natural philosophy is paid 600 or 1000 crowns, or even more, as is only right.’<sup>17</sup> This institutional fact is not insignificant.<sup>18</sup>

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<sup>14</sup> Kristian Jensen, *Rhetorical Philosophy and Philosophical Grammar: Julius Caesar Scaliger’s Theory of Language*, Munich: Fink, 1990, esp. pp. 186-91.

<sup>15</sup> Pierre Lardet, ‘L’aristotélisme pèlerin de Jules César Scaliger’, *Les Etudes philosophiques*, 3 (1986), 349-69; id., ‘Jules César Scaliger et ses maîtres : la rhétorique dans le champ de savoir’, *Rhetorica*, 4 (1986), 375-94; id., ‘Les ambitions de Jules César Scaliger latiniste et philosophe (1484-1558) et sa réception posthume dans l’aire germanique de Gesner et Schegk à Leibniz et Kant’, in *Germania latina – latinitas teutonica*, ed. Eckhard Kessler and Heinrich C Kuhn, Munich, Fink, 2003, 157-94; id., ‘Grammaire et philosophie chez Jules César Scaliger’, in *History and historiography of linguistics*, ed. Hans Josef Niederehe and Konrad Koener, Amsterdam and Philadelphia, J Benjamins, 1990, pp. 26-73.

<sup>16</sup> **Error! Main Document Only.** Kuni Sakamoto, *Julius Caesar Scaliger, Reformer of Renaissance Aristotelianism: A Study of Exotericae Exercitationes*, PhD. diss., University of Tokyo, 2012.

<sup>17</sup> *Actio prima in calumniatorem librorum de Subtilitate*, in *Opera Omnia*, ed. Charles Spon, Lyon, Jean-Antoine Huguéan and Marc-Antoine Ravaut, 1663, 3.674. Hereafter *OO*): ‘non disceptationibus sophistarum, sed in solidis studiis atque operibus [...] Satis est in scholis Dialecticorum, et sophistarum. Professor Dialecticae, vel Metaphysicae, viginti coronatis apud nos conducitur; Medicinae, et Philosophiae naturalis, sexcentis ac mille; atque etiam amplius, atque iure merito.’

<sup>18</sup> *Ibid.*, 3.674.

### Scaliger and Cardano before 1550

Once established at Albi, Scaliger set about writing on a variety of topics, mainly in the area of humanism. As Michel Magnien has shown, he did not have an easy path into publication. He found his way eventually to the door of the Parisian printer Pierre Vidoue in 1531 with his anti-Erasman *Oratio*, which not only showed his desire for literary glory by attacking the foremost humanist of the day, but also encapsulated his nationalistic defence of Cicero. Scaliger's second Parisian publisher – Michel Vascosan – produced his poetry, albeit with a demand for a subsidy; his third – the Lyonnais Sebastian Gryphius - brought out more poetry and his literary and grammatical studies. There are various theories as to how these publishers came to act for him. What is clearly the case is that Scaliger had no helpful institutional affiliation, and lived in a part of France that possibly suggested to Parisians that he was in a sort of intellectual vacuum. His success in the world of books can therefore plausibly be laid at the feet of his humanist correspondents, his quality as a poet and a philologist, and the combative nature of some of his writing. While he is clearly a rational doctor, he does not seem to have published or speculated in the area of practical medicine, whereas Cardano was a distinguished contributor to the field.<sup>19</sup>

Cardano's path to publication is very different. When he set out, he had only the adventitious support of a publisher friend from Padua, but he was aware of the value of self-advertisement, and through a licence that he shrewdly obtained and published in 1538, he came to the notice of first one international publisher (Joannes Petreius of Nuremberg) through his talent scout Andreas Osiander, and later others, including Sebastian Gryphius and Heinrich Petri of Basel. The licence's list of unpublished MSS showed him to be a polymath: works on mathematics, medicine, ethics, cosmology, astrology and natural philosophy are

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<sup>19</sup> See Magnien, 'Un humaniste face aux problèmes d'édition.'

cited. It is clear that for Cardano this was a coherent field, even if it is not for Brian Vickers.<sup>20</sup> By the time of the appearance of the *De subtilitate* in 1550, Cardano also had a secure position as a medical professor in Pavia. The only area of clear overlap with Scaliger by 1557 is the commentaries both write on ancient studies of dreams: Synesius in Cardano's case (begun in 1535-7), and Hippocrates in Scaliger's case (1540) (a commentary probably used by Cardano).<sup>21</sup> It seems to me unlikely that this would have constituted the reason for a rivalry expressed through a general polemic.

### *De subtilitate*

Cardano's *De subtilitate* came to him in a recurrent dream in 1547<sup>22</sup>; it is one of two works (the *Dialectica*, conceived in 1559-60 being the other) which sets out to be a comprehensive (if allusive) account of a whole field of knowledge.<sup>23</sup> The initial vision provided by Cardano's 'numen' underwent revisions in both cases; so that the excitement of a new synthetic intellectual vision gave way to self-criticism. The *De subtilitate* is part of a series of four works (together with the *De fato* of 1533, the *Arcana aeternitatis* of 1538 and the *De rerum varietate* of 1552-3), all written not for a popular audience but for the learned.<sup>24</sup> Together they constitute Cardano's comprehensive account of all of nature, cosmology, and human activity.<sup>25</sup> These are not texts which rely on *auctoritates*, although they recognize the virtues of past thinkers: in the case of Galen, his method (that of the *Ars parva*), various of his precepts, and his mode of argumentation<sup>26</sup>, and in the case of Aristotle his 'experimenta'

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<sup>20</sup> On Cardano's path to publication and early writings, see *De libris propriis*, ed. Ian Maclean, Milan, FrancoAngeli, 1999, pp. 9-90.

<sup>21</sup> Siraisi, *The clock and the mirror*, pp. 188-9.

<sup>22</sup> Scaliger didn't think much of this as an explanation: see *Exotericarum exercitationum liber XV de subtilitate*, Paris, Michel Vascosan, 1557, 350, f. 458.

<sup>23</sup> See *De libris propriis*, p. 100: Ingo Schütze, 'La Dialectica di Cardano e la rivalutazione enciclopedica della logica', in *Cardano: le opere, le fonti, la vita*, pp. 147-57.

<sup>24</sup> *Actio*, in *OO* 3.677, 688.

<sup>25</sup> *De libris propriis*, pp. 83-5.

<sup>26</sup> The opening pages of the *De subtilitate* make a number of references to Galen's advice, relating to the absolute precedence of 'experientia', of functionalism, the usefulness of the geometric method, and the rules given in the *Ars parva* and elsewhere (see Maclean, *Logic signs and nature*, pp. 200-3). See also *ibid.*, 16, 3.608

and to some degree his logic. From the outset, Cardano makes a clear distinction between Aristotle the student (but not the theorist) of nature and Aristotelians, who elevate him to the status of authority, and who are described as intellectually incompetent.<sup>27</sup> Cardano insists from the beginning on the priority of *res* over *verba*, of experience over theory, and on the correct trajectory from experiment to ‘rationes’, demonstration, and finally ‘declaration’ (the substantive doctrine proposed in the *De subtilitate*).<sup>28</sup> He contrasts this work with his *Contradicentia medica* of 1548, where he claims still to use ancient writings as authorities.<sup>29</sup> He certainly refers to authorities in the *De subtilitate*, using the formulae ‘teste Galeno, Aristotele, autoritas Hippocratis’, but what he is referring to is their record of ‘experientia’, not their theories.<sup>30</sup> For him, reliance on the word of any master is both pusillanimous<sup>31</sup> and misguided: the practice of extracting meaning about the world from authoritative texts through commentary, he claims, has blighted 2000 years of natural philosophical enquiry: ‘for as peripatetic philosophy has been with us for 2000 years and has been celebrated by so many commentaries, but, on the other hand, the piety with which it has been treated has in truth been only damaging, and it has produced so little fruit in the investigation of nature and

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(on species and genera). *De rerum varietate*, 99, OO 3.346-8 sets out the relationship between ‘resolutio’ ‘finis’, ‘principia’, and geometrical method. *De Subtilitate*, 17, OO 3.598-9 makes the claim that of all sciences, geometry is the most subtle (a claim contested by Scaliger, who suggests that this honour should go to theology (or metaphysics): *Exotericae exercitationes*, 321, f. 433r-v). Cardano also mentions in this passage the ‘reflexa proportio’ that he discovered (see below, note 43). *Actio*, OO 3.679 and 683 refers to Galen preferring ‘res’ to ‘verba’; and the former passage refers to Galen as recommending ‘charitas’.

<sup>27</sup> OO, 3.381, 386, and book 2, *passim*.

<sup>28</sup> Ibid., On Cardano’s use of ‘experimentum’ to mean medical recipe, see *De libris propriis*, pp. 74-5. Schütze, ‘La Dialectica’ 151 refers to a different four elements (‘risoluzione, collezione, inquisizione, dimonstrazione’), makes the point that Cardano follows Averroes in distinguishing ‘dialectica generalis’ and ‘dialectica specialis’, and stresses the usefulness of geometrical demonstration and method in Cardano’s eyes. On *res* and *verba* and Galen see Maclean, *Logic signs and nature*, p. 106. At 679, ‘verbum’ is opposed to ‘significatum’, and 689 ‘profunditatem verborum’ to ‘cortice’, thereby shifting the debate into the domain of hermeneutics.

<sup>29</sup> OO, 21, 3.390

<sup>30</sup> *Actio*, OO.3., 681, 682, 686. Cardano even refers to the reviled Rondelet in this way: Ibid., 700.

<sup>31</sup> Ibid., 699: ‘haec est peripateticorum inconsulta temeritas, et audacia incredibilis, non Aristotelis, aut Theophrasti, sed eorum qui aliorum nominibus egregiis iniustissime sibi sapientiae famam vindicant. Defende modo hominem a stultitia, a levitate, a temeritate, a mendatio manifesto, si potes quisquis es, et crimine ab uno disce omnes.’ Note the address here to the unknown reader.

the arts in comparison with our discoveries, that it is now agreed to be false about nature or to have interpreted it wrongly.’<sup>32</sup>

The novel doctrine of the *De subtilitate* is still recognizably a revision of Aristotelian physics, even if the number of elements and qualities has changed. There is a clear commitment to Galen’s functionalist approach to nature and human physiology, but it is not unreflecting: Cardano is aware of the Epicurean arguments about chance and nature, which he explicitly rejects.<sup>33</sup> Because of the global compass of the *De subtilitate*, Cardano has to negotiate an awkward frontier with theology. He seriously mismanaged this in the first edition of the *De subtilitate* in his discussion about religions, by suggesting at one point that they were all equipollent. That sentiment (‘his arbitrio victoriae relictis’) caused outrage, and was duly eliminated from the second edition of 1554, which contained many other revisions and corrections.<sup>34</sup> Two years later, a French translation of the first edition appeared in Paris, aimed at a more popular audience; a third Latin edition appeared in 1560 in Basel.

Two further points should be made about the text at this point. First, Cardano’s restless revision of all his texts meant that he clearly expressed the provisional nature of his findings. In the work he wrote on the immortality of the soul which appeared in 1545, he expressed[?] this in the following way:

I love and honour Galen [...] and although I disagree with him on this matter in the name of truth - a dearer friend to me than even he - no-one has exalted him with a more ardent will than I, insofar as it was in my power. But when I saw that in his haste, impelled by such

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<sup>32</sup> Ibid., 713: ‘nam cum peripatetica Philosophia iam duobus abhinc annorum millibus evulgata sit, et tot commentariis illustrata: ad pietatem quidem non nisi detrimentum, ad naturae autem et artium experimenta tam parvum fructum attulit nostrorum inventorum comparatione, ut illam aut falsam, aut nondum bene intellectam esse constet.’

<sup>33</sup> *OO*, 11, 3. 549 (De hominis necessitate et forma). Cardano quotes a selection of lines from Lucretius, *De rerum natura*, 5. 837-77.

<sup>34</sup> See *De Subtilitate*, Paris, ex officina Michaelis Fezandat and Roberti Granjon, 1550, 214r; (*OO* 3.551-2 has the revised version: ‘sed haec parum Philosophis attinent, pro quibus institutus est sermo’); and *Exotericarum exercitationes*, 258.1, f. 332r.

desire for glory and such vain ambition for popular favour, he wrote things full of error that can be of harm to many because of his authority, I considered it necessary to counsel everyone that they should believe only as much as reason itself dictates, and that it is not sufficient to have said to themselves, ‘Aristotle states’ or ‘Plato’, or ‘Archimedes’, or ‘Ptolemy’, or ‘Galen’; but that they should weigh the force of the argument; and in respect of my own pronouncements, if ever they should come to have any authority, I not only freely permit this, but require it to be done.<sup>35</sup>

The second, related, point concerns the force of the words ‘*experientia*’ and ‘*experimentum*’. What Cardano sets out here sounds a bit like what we might call scientific method, but it lacks a number of features of such an approach. First, there is no suggestion that observations need to be independently verified, or that experiments need to be repeated in the company of different witnesses; equally, the hypothetical-deductive process is not complete, as the theories put forward by Cardano are not subject to the sort of expression which would allow for the relationship of experiment to theory to be adequately expressed.<sup>36</sup>

#### Scaliger’s *Exoticae exercitationes*

There is a long gap since Scaliger’s previous publication (of his poetry) and the appearance of the *Exoticae exercitationes*. It seems that he still very much desired to be seen as a ‘great philosopher’ (according to his friend Jacobus Carpentarius), but this was not

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<sup>35</sup> Cardano, *De immortalitate animorum*, ed. José Manuel García Valverde, Milan, FrancoAngeli, 2006, p. 195: ‘Galenus amamus, colimus, [...] et quamvis hac in parte ob veritatem, quae nobis magis etiam quam ille amica est, ab eo dissentiamus, nullus tamen ardentiore, voluntate illum, quantum per vires licuit, extulit. Sed cum adeo cupidum illum gloriae, ambitionis inanisque aurae properantem aliqua perperam scribere videmus quae multis ob auctoritatem iacturae esse possunt, necessarium duximus, omnes admonendos ut tantum cuique credant, quantum ratio ipsa coegerit, nec sufficiat illis dixisse, Aristoteles dixit, vel Plato, aut Archimedes, vel Ptolomaeus, aut Galenus: sed vires argumentorum pensitent: quod et in nostris placitis, si aliqua unquam futura est nobis auctoritas, non solum libenter permittimus, sed requirimus.’

<sup>36</sup> For one of the earliest full-blown accounts of what is now known as scientific method, see Johann Christoph Sturm, *De auctoritate interpretum naturae* [...], Altdorf, typis Johannis Henrici Schönnerstaedt, 1672. See also Thomas Ahnert, ‘The culture of experimentalism in the Holy Roman Empire: Johann Christoph Sturm (1635-1703) and the Collegium Experimentale’, unpublished manuscript available at <http://sammelpunkt.philo.at/8080/308>.

the only motivation to write a long diatribe against Cardano.<sup>37</sup> There can be little doubt that the *De subtilitate* caused the same deep vexation in him as Erasmus's *Ciceronianus*, and that Cardano's popularity (evinced by the French translation of his work) as well as his interpretation of nature characterised by Giglioni as 'platonizing Averroism' annoyed him deeply, as well as the many insults directed at Aristotelians.<sup>38</sup> He also seems to be genuinely outraged by what he takes to be Cardano's impiety.<sup>39</sup> He indicates these sentiments in his open letter to Vascosan.<sup>40</sup> For three years, he avers, he kept to himself the record of his criticisms before contacting his friend Jean de Maumont (an aficionado of the Paris publishing scene) and sending them through him to Vascosan, who agreed (perhaps surprisingly) to pay for the printing of a fat quarto with illustrations, which Scaliger expects to suffer (or enjoy) 'efflagitio'. This could mean either severe criticism or high demand by the republic of letters: Magnien sees the former meaning, where I incline to the latter.<sup>41</sup> The fact that Vascosan agreed to pay for the printing needs some comment, given that he had previously asked for subsidies from Scaliger for much smaller publishing enterprises (his poetic *Nemesis*).<sup>42</sup> Maybe the French translation created a genre feeding a new market sector prompted Vascosan to calculate that the *Exotericæ Exercitationes* would do well; or simply the fact that polemics tended to be followed by interested and engaged readers.

Scaliger offered other comments on his motivation, of a predictable kind: he was, he says, 'not moved by an ambition to contradict or challenge, but inspired by a right common to all scholars, I have brought before you, as a universally acknowledged arbiter of all learning,

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<sup>37</sup> Cited by Jensen, *Rhetorical philosophy and philosophical grammar*, p. 46.

<sup>38</sup> Guido Giglioni, 'Girolamo Cardano e Guilio Cesare Scaligero: il dibattito sul ruolo dell'anima vegetativa', in *Girolamo Cardano: le opera, le fonti, la vita*, pp., 313–39.

<sup>39</sup> The attack on the offensive passage referred to in footnote 23 is found at *Exotericæ exercitationes*, 258.1, f. 332r; see also *ibid.*, 61.2, 93v. Cardano returns the accusation in the *Actio*, OO 3.700, 702.

<sup>40</sup> *Exotericæ exercitationes*, sig. \*2r.

<sup>41</sup> Magnien, 'Un humaniste face aux problèmes d'édition.', 313-14.

<sup>42</sup> *Ibid.*, 314.

principally those things that can only be made clear to us by your work.’<sup>43</sup> From the beginning, he stamps his work with a Ciceronian colour, by relying on Cicero’s definition of subtlety. He also explicitly defends a certain version of Aristotle against Cardano, and rejects both numerology and daemonology that were seen by Cardano as legitimate features of natural-philosophical enquiry. He also successfully makes fun of some very inconsistent or paralogical claims made by Cardano about tastes and demons.<sup>44</sup> There are marginalia throughout indicating the tone of the text: ‘subtile’, ‘acute’, ‘subtilissimus’, even ‘jocus’.<sup>45</sup> For all that, I tend to agree with Jensen who says that Scaliger is not a humorist.<sup>46</sup>

### *The Actio in calumniatorem*

Cardano’s response, couched in the form of a forensic document (a formal accusation), appeared in 1559. But the legal dimension, to which reference is occasionally made (there are references to interpretation by jurists, positive as opposed to negative witnesses, and cavillation<sup>47</sup>) is not sufficiently prominent to prevent Cardano from renaming the text an ‘Apologia’ in 1560, when it appears for the second time as an appendix to the third edition of the *De subtilitate*. Its first publication in a collection of texts entitled *Quaedam opuscula* indicates that Cardano’s publisher, Heinrich Petri, was prepared to publish almost anything by him at this stage in his career. It was in fact Petri who sent Cardano a copy of the *Exotericae exercitationes*, no doubt in the expectation that he would react as he did.<sup>48</sup> Like many Cardano texts, it is dedicated to a Milanese Churchman (Francesco Abbondio, the Commendatory Abbot of Sant’Abbondio), although there is no

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<sup>43</sup> *Exotericae exercitationes*, 365.1, ff. 471-2; 355, ff. 459-61 : ‘ non enim contradicendi, aut contendendi ambitione motus, sed communi omnibus studiosis iure excitatus, ea protuli coram te maximo omnium consensu literarum dictatore iudicanda: quae nonnisi tua opera nobis esse plana possent.’

<sup>44</sup> For a list of these, see Maclean, ‘The interpretation of natural signs’, pp. 241-2.

<sup>45</sup> Cardano refers to these marginalia in the *Actio*, *OO* 3.688.

<sup>46</sup> *Rhetorical Philosophy and philosophical grammar*, p. 21 (referring to the *Orationes* rather than the *Exotericae exercitationes*.)

<sup>47</sup> *OO* 3.686 (‘contestibus more iureconsultorum fidem adhibeo, subscribente prius ratione’); 688 (‘cavillationes et sophismata’); 700 (‘testis unus affirmationis centum negantibus praeferri debet’)

<sup>48</sup> *Actio*, in *OO* 3. 677.

direct address to him in the text. Cardano does not name Scaliger, and for much of the text refers to him in the third person: on occasions, however, he is addressed aggressively in the second person. Cardano claims to be driven by a desire to take everything charitably and ‘in good part’, and to practice the Christian virtues of loving one’s enemy and turning the other cheek; he goes so far as to claim that ‘I shall abstain from all debate and contumely lest I should be taken to be like him’<sup>49</sup>; but this is not sustained, as is witnessed by the insults that Cardano heaps upon his opponent. Scaliger, for him, is motivated by envy (*livor*), perversity, and a spirit of contradiction (‘*contradictionis studio*’: Bayle agrees). He hasn’t understood what the role of an ‘accusator’ is.<sup>50</sup> He is full of stupidity (*stupor*), possibly drunk<sup>51</sup>, trivial-minded, incompetent, and ignorant of medicine, mathematics, logic and geometry and experiment<sup>52</sup>: he is no innovator (‘*inventor rerum novarum*’) as Cardano is himself, but a slavish reader of texts, unable to rise above the grammatical to the sense behind the words.<sup>53</sup> He is a prolix and someone who misquotes: an ‘*ambitiosus Christianus, superbus Philosophus, medicus aniatrologetos*’ who ‘reads carelessly, interprets perversely, and engages in futile argument [...] he is bad at interpretation, worse at argument, and worst of all at drawing conclusions’ (‘*inconsiderate legit, perverse interpretatur, et futile arguit [...] qui male interpretatur, peius argumentatur et pessime concludit.*’) Other descriptions include ‘*Rhetor egregius*’, ‘*novus Cicero*’, ‘*novus Priscianus*’ ‘*Grammaticus*’, ‘*dialecticus*’,

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<sup>49</sup> *OO* 3.678: ‘*abstinebimus ab omne iurgio [debate] ac contumelia ne illum imitemur.*’

<sup>50</sup> *Ibid.*, 695 ‘*Est autem officium boni accusatoris aut reprobare sufficienter, aut longe verisimiliorem causam assignare.*’

<sup>51</sup> *Ibid.*, 704

<sup>52</sup> *Ibid.*, 607: ‘*parum in mathematicis exercitatus.*’

<sup>53</sup> *OO* 3.708. Cardano vaingloriously records in his *De propria vita* (ch.44, *OO* 1.40) that his friend Andrea Alciato called him ‘*vir inventionum*’. In a characteristic (self-regarding) digression, Cardano includes also an autobiographical passage about his early life: *OO* 3.708-9. It might be said charitably that his reference is to an undisputed ‘*experientia*’, as in the personal anecdotes at *ibid.*, 692 and 712. On his innovations in knowledge see 711 (*Metoposcopy*). Also 692-3: ‘*in verbis, ubi plinium non sequi religio est, relinquit: in rebus ipsis et causis Grammaticum, quod prophanum est amplectitur: non enim tam amens sum, ut in nominibus accusem Plinium, qui tanto prior fuit florentis Latinae linguae seculo, et tunc adhuc scriberet cum pronuntiatio, tum ipse modus loquendi vigerent, et apud Romanos multa quasi nutu significarent, quae nunc apud nos nullis verborum circuitibus etiam possunt explicari.*’

‘sophisticus’, and a believer in ‘peripatetica theologia’ (i.e. Aristotelian metaphysics).<sup>54</sup>

Scaliger’s accusation that Cardano is impious generates a counter-accusation that Scaliger is as a peripatetic a believer in the heretical doctrines of the eternity of the world and the absence of the rewards and punishments that await mankind in the afterlife.<sup>55</sup> Cardano defends his pragmatic use of Latin against Scaliger’s humanistically-inspired attacks on his style: this is somewhat ironic, given that Scaliger himself, both inside and outside the context of the *Exotericae exercitationes*, excuses the use of barbarisms and neologisms in his *De causis*.<sup>56</sup> Cardano seems to have some inside information about Scaliger’s original purposes (one of which was to refer to Cardano’s text as ‘de futilitate’: a quip which Scaliger’s friends apparently persuaded him not to use<sup>57</sup>). In all of the ripostes, Cardano concedes only one point (that the *proportio reflexa* is a geometrical construction that can be represented algebraically).<sup>58</sup> His most frequent complaint is that Scaliger addresses all his remarks to the first edition, and ignores the corrections that Cardano introduced in 1554, in spite of having the second edition of the *De subtilitate* available to him. Both thinkers assume that their adversary should refer to all of their writings, whether they had appeared in print or not:

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<sup>54</sup> Ibid., 3.689, 694, 708, 682, 676-7, 712; ‘theologica’ here is metaphysics. Scaliger refers himself to ‘peripatetici theologi’ (*Exotericae exercitationes*, 61.2, f. 93v. The term ‘grammaticus’ is used by physicians as an insult directed at those whose interest in the text stops at the words being used: for examples, see Nancy G. Siraisi, ‘Giovanni Argenterio and sixteenth-century medical innovation between princely patronage and academic controversy’, *Osiris*, 2nd series 6 (1990), 161-80, at 169, and Ian Maclean, *Logic, signs and nature*, p. 104. As Giglioli points out (‘Scaliger versus Cardano versus Scaliger’, pp. 120-1, citing *Exotericae exercitationes*, 88, f. 134v), Scaliger was aware of the possibility of being accused of mere verbalism.

<sup>55</sup> *Actio*, OO 3.674, 708; there is a nice parody of his argument about the relationship of God to nature at *ibid.*, 687: ‘Idem vero pulcherrime probat Aristotelis sui autoritate Deus et natura, ergo Deus est natura. Assensus est Pompeius Ciceroni, ergo Pompeius est Cicero.’ Cardano also points out that the accusation of impiety is one which can be brought out at any moment when all else fails: OO 3. 702 ‘postquam rationibus nec experimentis vincere non potest, ad pietatis patrociniū se referat.’

<sup>56</sup> This is a complex issue, as it involves the conviction that all Italians had a better grasp on Latin than other European nations, and had more affinity with that language than with Greek: see *Exotericae exercitationes*, 140, f. 223, *Actio*, OO 3.691 (pastiche of this passage), *ibid.*, 675 (on Scaliger’s Latin), 704 (the relative capacity of Germans and Italians for Latin) and Jensen, *Rhetorical philosophy and philosophical grammar*, p. 189. For Scaliger’s flexible attitude to barbarisms, see *ibid.*, pp. 21-2, and *Exotericae exercitationes*, 100, f.150v (‘permitte mihi barbāre loqui et bene sentire’). See also Paola Pirzio, ‘Note sulle tre redazioni del *De Subtilitate* di Girolamo Cardano’, in *Cardano: le opera, fonti, la vita*, pp. 176-7. See also Giglioli, ‘Scaliger versus Cardano versus Scaliger’, pp. 120-2.

<sup>57</sup> *Actio*, OO 3.673. Cardano had contacts in the Parisian book trade, and one colleague (Francesco Vimercati) who published books with Vascosan. He may have heard this rumour through one of them.

<sup>58</sup> *Ibid.*, 3.709 makes the concession: on this theorem, see Albrecht Heeffer, ‘Cardano’s favourite problem: the proportio reflexa’ (13 July 2013), <http://www.academia.edu/4039045>.

Scaliger referring to earlier books of his *Exercitationes exotericae*, Cardano to the *De fato*, the *Arcana aeternitatis* and other unpublished works, or works published after the appearance of the *Exotericae exercitationes*.<sup>59</sup> Cardano also creates lists of good scholars and bad scholars, which are in themselves quite revealing.<sup>60</sup> His text refers to its readers in a number of different ways, which does not necessarily make for easy reading.<sup>61</sup>

The most important point to emerge explicitly from Cardano's *Actio* is his insistence that the three disciplines of medicine, natural philosophy and mathematics are not grounded in grammar, but in 'experimenta vera' from which 'principia' are derived, that are developed by 'ratio' into 'demonstrationes' and from there into 'declarationes.' Medicine is his preferred discipline: 'we never depart from the discipline of medicine, unless, for reasons of pleasure, to switch to that of mathematics, that I have taught since my youth.'<sup>62</sup> Manners of argumentation are discipline-specific: this insight will be developed into a comprehensive theory of argumentation in the *Dialectica* written shortly after the *Actio*. Cardano also argues against purely causal accounts of nature: the causes he alleges are 'more fundamental' ('principaliores') and 'sufficiently probable' ('satis probabiles': not here is the sense of authoritative, but in the sense of likely, and not therefore apodictic; for Cardano, causes of this kind are adequate in the realm of the experience of nature and the world.)<sup>63</sup> Another

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<sup>59</sup> E.g. *Exotericae exercitationes*, 51, f. 78v; 61.1, 91v; *OO.3.675* (references to *De urinis*, published in 1557, *Ars curandi parva* published in 1562, *Hymnus ad Deum*, MS, and *De Curationibus mirabilibus*, published in 1557), *ibid.*, 683 et sqq. (*De rerum varietate*, published in 1557), *ibid.*, 686 (*De aqua et aethere*, published in 1559), *ibid.*, 697 (*De libris propriis*, 1557, and *De indico morbo*, MS), *ibid.*, 700 (reference to 'libris de Fato de nobis editis': they never appeared in print), *ibid.*, 709 (*De Arcanis aeternitatis*, MS). Cardano seems to know that he wrote a book called *De sapientia*, but this did not appear until 1573: *ibid.*, 703. Perhaps this text and some of Cardano's circulated in MS.

<sup>60</sup> Lists of scholars (good), at *ibid.*, 674 Budé, Alciato, Erasmus (708 'noster'), Vesalius, Brasavolus, Fuchs, Cornarius; (good), *ibid.*, 691 Vannotus, Biringarius, Matthiolus; (bad) Marius Nizolius Antonius Maioragius *ibid.*, 700 Rondelet; *ibid.*, 697 Manardus.

<sup>61</sup> See the use of tu throughout, to refer to readers and Scaliger; also 'benigne lector', *ibid.*, 685; 'quisquis es' *ibid.*, 661; 'quis non vidit' *ibid.*, 702.

<sup>62</sup> *Ibid.*, 3.713: 'nos enim a medicina nunquam discedimus, nisi ad mathematicas, quas a pueritia didici, divertero voluptatis causa.'

<sup>63</sup> *Ibid.*, 3.701 There are many passages that allude to the various 'genera declarandi [rectum Mathematicorum, divisivum Galeni et participans seu reflexum, quod est omnibus difficilius Ptolemei]' (689), the combination of *authoritas* (in the form of experiential testimony) *experimentum* and *ratio* (also 686 *Astrologorum authoritas*, et

extraordinary insight (from which Cardano does not exclude Averroists) is that knowledge of the natural world is frequently counter-intuitional.<sup>64</sup>

### Cardano after the *Actio*

We cannot know whether Scaliger would have produced a further reply, as he died before the *Actio* appeared: but we can say something about Cardano's subsequent habitus of mind. He had already started on his Hippocrates project (to write commentaries on all of the corpus) which committed him to a case-based approach to medicine, together with an implicit ontological view of nosology.<sup>65</sup> This was not purely empirical, as his *Actio in Thessalicum medicum* of 1557 shows, but it was experimental in Cardano's sense: that is, it does not rely uniquely on apodictic demonstration. The *Dialectica* of 1559 that he was inspired to write in only seven days develops another feature of the *Actio*: namely the notion of argumentational modes specific to disciplines. These may well have always been in Cardano's fertile mind, but become more explicit in the 1560s. Scaliger did not change his mind, therefore, but helped focus it. This is not the place to examine in detail his other intellectual preoccupations after 1560, but it is pertinent to add that his last work - the *De prudentia eximia* left incomplete at his death in 1576- is a sort of summum of his mathematical, divinatory and ethical thought that deploys the insight that there is a probability in the mathematical sense of

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experimentum et ratio), leading to declaratio (of a theory), 686; qui in mathematicis exercitati sunt, veras rationes a falsis ob consuetudinem declarandi norunt'; 'criteria vera experta ratione convenientia' [Is it referring to the passage "Nugas agit meras, nisi cum venarum apertione agit, sunt enim vera, et experta, et ratione convenientia"?] 695; 'vera principia' 685; on medicine and natural philosophy; 685 'en vides quomodo veris principiis omnia experimenta, omnia nostra dicta consentiant' (note here the direct address to Scaliger) 705 'mathematice et naturaliter declarari'. 684 [on *Exeritationes exoterae*, 45 and perpetual motion]: 'ita ista Aristotelici cum ad experimenta se conferunt, seu cum medicis, seu cum architectis aut mathematicis, aut veris Philosophis, qui certis principiis insistent, aut artificibus vani semper deprehenduntur.'

<sup>64</sup> Ibid., 674 (of Averroist Aristotelians who accept the doctrine of the eternity of the world) norunt enim alia esse, quae sensibus innitens homo diiudicat: alia quae nequimus attingere, et in quibus hallucinamur, quae quanto minus sunt probabilia, tanto sunt magis vera.

<sup>65</sup> See Siraisi, *The clock and the mirror*, pp. 119-47.

the word which can not only help prediction but also provide consolation in the vicissitudes of life.<sup>66</sup>

### Conclusion

Have I changed my opinion about the debate and its participants since 1982? Hardly at all about Scaliger, who remains for me an ‘esprit de contradiction’ (a ‘mens contradicendi studio flagrans’<sup>67</sup>) with a strong commitment to rhetorical philosophy. In respect of Cardano, I see more clearly the degree that Scaliger’s attack provided the necessary catalyst for him to develop his bold new theorising, his sense of the provisional nature of his claims, and his conviction that the way forward involves a mind-set that gives priority to a real interaction with the world, and a flexible approach to processing the data of experience. This is not the scientific revolution *avant la lettre* (Cardano is too much of a maverick and individualist for that to be true) but I believe ~~that it~~ it to be a necessary precondition of the new science of the seventeenth century. Cardano’s rejection of the argument from authority is another such precondition.

I do not think that the ‘absolute presuppositions’ binding both Scaliger and Cardano can be easily recovered, or can yield interesting insights. They certainly do not include Epicurean natural thought, or functionalism, or Christian providence, all of which both thinkers are able to articulate as possible intellectual commitments. What we might be inclined to describe as intellectual commitments are known to both thinkers, if only intermittently. But such commitments do not reveal the degree of seriousness with which the thinkers enter into discussion about them.<sup>68</sup> Even their commitment to rationality is not an

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<sup>66</sup> I am preparing an edition of this work, on which see my ‘Girolamo Cardano: the last years of a polymath’, *Renaissance studies*, 21 (2007), 587-607.

<sup>67</sup> *Actio*, OO 3.677.

<sup>68</sup> On this point, see Maclean, *Logic, signs and nature*, pp. 1-13; id., ‘The process of intellectual change’; id., ‘Sicut erat in principio: attributing meaning to early modern mathematical and scientific texts’, *Scientia poetica*, 10 (2006), 169-88 (esp. note 11). I suggested there that not all meaning-events in past texts are alike, that the

unthinking or uncomplicated one, as *Exercitatio 307* and Cardano's *Dialectica* show.<sup>69</sup>

Astrology and numerology can be seen in Cardano's terms as rational investigations: here Scaliger's fidelity to the relevant texts in Aristotle's *Metaphysics* does mark a clear divide between the two thinkers. The Ciceronian and Quintilian topics recovered in the fifteenth century have a role to play in Scaliger's writings, but less so in Cardano's, who shifts the ground towards a more empirical (but not experimental in the modern sense) view of intellectual endeavour. I also don't think that the opposition of occult versus scientific works is a valid one in the case of early modern thinking.<sup>70</sup>

Do Scaliger and Cardano belong to the same 'universe of discourse'? If they do, it should be possible to say who is more right about Aristotle: but in fact both use him for their own purposes, Scaliger to christianize him, Cardano to plunder his writings for helpful 'experimenta', and to use his logical works as springboards for further dialectical reflection. The commitment that Scaliger has to Aristotle as a truth-bearing authority, 'nostrae Sapientiae dux', is one of which he is fully aware, and not therefore an absolute presupposition.<sup>71</sup> One might try to surmise how Scaliger might have replied to the *Actio* if he had had the chance; I doubt whether he would have very much changed his line of attack as a 'philologus' in the rich sense of that term. Would he have failed to understand the points made by Cardano? I don't think he would necessarily have got all the mathematical and geometrical points, but he did make Cardano concede on one issue (the *proportio reflexa*), so even that may not be true.<sup>72</sup>

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awareness of past thinkers of the full implications of their propositions and theories has in general been underestimated in histories of thought, and that there may be something to be said for seeing meaning as more independent of its historical context than has recently been the fashion.

<sup>69</sup> On *Exercitatio 307*, see Ian Maclean, 'Cardano's eclectic psychology and its critique by Julius Caesar Scaliger', *Vivarium*, 46 (2008), 392-417. On the *Dialectica*, see Ingo Schütze, 'La dilectica'.

<sup>70</sup> For a recent critique, see Jan Machielsen, *Martin del Rio: demonology and scholarship in the Counter-Reformation*, Oxford: Oxford University Press, 2015.

<sup>71</sup> *Exotericarum exercitationes*, f. 2v.

<sup>72</sup> *Actio*, *OO* 3.709 [321] 'simile illud quodcunque accipit, vel probat geometra, per numeros dirigi potest. Quid absurdius? Quid a veritate magis alienum dici potest, inscriptiones figurarum et circumscriptiones, tum

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corporum, anguli, contactum rectorum cum circulis, obliquorum cum rectis excessus, quanam arte ad Arithmetricam redigi possint, non video. Sed neque gemina reflexa proportio: reducat hanc ad numeros, et cedimus illi.’ Scaliger supports here algebraic geometry, as does the new science of the seventeenth century.