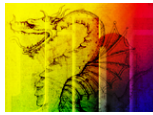


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– Section 2: Articles –

Erasmian Science

by

Pietro Daniel Omodeo and Enrico Pasini



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### **Section 1: Editorials**

1. *Gastronomy and Revolution* (M. Albertone – E. Pasini)

### **Section 2: Articles. Special Issue: Erasmian Science**

2. *Erasmian Science* (P.D. Omodeo – E. Pasini)
3. *The Fabrist Origins of Erasmian Science: Mathematical Erudition in Erasmus' Basle* (R.J. Oosterhoff)
4. *Erasmus, Agricola and Mineralogy* (F.G. Sacco)
5. *Erasmus and Medicine* (S. Mammola)
6. *Erasmus and Geography* (N. Ron)
7. *Erasmian Philology and Mathematical Astronomy: Jakob Ziegler and the Humanist Recovery of Pliny's Natural History, Book Two* (P.D. Omodeo). With *A Technical Note on Epicyclical Interpretations of Pliny's Planetary Theory* (I. Tupikova)

### **Section 3: Notes**

8. *Review-Interview. Vox populi. Une histoire du vote avant le suffrage universel, avec O. Christin* (M. Albertone)

### **Section 4: Reviews**

9. *Book Reviews* (C. Carnino, M. Menin)

### **Section 5: News & Notices**

10. *Activities of the GISI | Les activités du GISI (2014-2015)*

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# Erasmian Science

Pietro Daniel Omodeo and Enrico Pasini \*

*This special issue of the Journal of Interdisciplinary History of Ideas takes its origin from a call for paper on the theme: “Erasmian Science: The Influence of Erasmus of Rotterdam on Early-Modern Science”. Is there any disciplinary field or scholarly context of the past that can be conveniently indicated as (an) ‘Erasmian Science’? Can this expression, as some sort of historiographic construct and instrument, direct the investigation of historians of scientific culture to realms and relationships that have so far escaped their consideration? This are the challenges we are putting forward in this Introduction, offering some background and suggestions as to the feasibility of more thorough studies of ‘Erasmian Science’.*



Erasmus of Rotterdam stands out, in cultural history, as the main representative of European humanism<sup>1</sup>. In many ways his legacy is inseparable from humanism in general: “L’influence d’Erasmus—as it has been remarked—[est] difficile à dissocier de celle de l’humanisme en général et de celle de l’humanisme

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<sup>1</sup> If there is an overused expression attached to his name it is undoubtedly that of ‘prince of humanists’ (although the formula has been also used for others, like Petrarch or Bembo, it became in the 19<sup>th</sup> century a sort of Erasmian antonomasia); see f.i. Richard J. Shoenke, *Erasmus of Europe*, vol. 2, *The Prince of Humanists, 1501–1536* (Edinburgh: Edinburgh University Press, 1993), vii, 195, 210, 259.

chrétien en particulier”<sup>1</sup>. His work marked more than one generation of early-modern scholars and intellectuals. He established an international *respublica litterarum* sharing common humanistic values, and his editorial activity reached unprecedented standards of ‘scientific’ quality<sup>2</sup>. His oeuvre radiated out particularly from major printing centers (Venice, Basel and Paris), and was immediately echoed in Britain and throughout continental Europe.

It can be argued that philology is the ‘Erasmian Science’ *par excellence*. In fact, Erasmus’ relevance for early-modern philological and editorial culture can hardly be underestimated. His work in Paris with Josse Bade, in Venice with Aldus Manutius, and in Basel with Johannes Froben, set standards of accuracy and elegance that were to affect at once the reading of sources, philological accuracy, scholarly language, and typographical style—not last the visual element. The leading question of this special issue of the *Journal of Interdisciplinary History of Ideas* will be whether ‘Erasmian Science’ went beyond the spheres of rhetoric, pedagogy and the edition of religious text where his legacy is well known and has been studied in much detail: Apart from his role as a public intellectual in the turmoil of his time (notably, his irenic battle), did Erasmus influence scholarship in disciplinary fields that have so far escaped our attention? Were his activity, legacy, and networks also connected with the development of early-modern natural, mathematical and empirical sciences? Are there significant Erasmian components in the dawn and development of Renaissance and Early-Modern science? Could we felicitously apply the category of ‘Erasmian Science’ to scholars who openly embraced Erasmus’ intellectual model in the time of the early reception of his ideas?

We shall see that under the title of ‘Erasmian Science’ we can range a swarm of different cultural elements with different historical weight: an involvement of Erasmus and his circles, as it has been hinted; a cultural openness, or an inclusive linguistic attitude, proper to them; contributions—again originating from ‘Erasmianism’—to the development of new mentalities in relation to nat-

<sup>1</sup> Marcel Bataillon, *Erasmus et l’Espagne: recherches sur l’histoire spirituelle du XVI<sup>e</sup> siècle*, ed. Charles Amiens, II ed. (Genève: Droz, 1991), vol. 3, 155.

<sup>2</sup> On Erasmus’ fame, as linked to his publications and to the development of an international network of correspondents, see Christoph Galle, *Hodie nullus – cras maximus: Berühmtwerden und Berühmtsein im frühen 16. Jahrhundert am Beispiel des Erasmus von Rotterdam* (Münster: Aschen-dorf, 2013).

ural, mathematical, medical science and practice; a specific role played by the intellectual and professional practices that characterize Erasmus and his followers in the subsequent developments of natural and mathematical sciences; the existence of one or more scientific communities imbued, for a certain time, of ‘Erasmian’ principles; a style, an ethos of knowledge to be found in Erasmus’ own attitude and works or that can be traced (also) to him. We might thus be speaking of merely a tinge, or an impulse, given to a certain kind of science, at a certain time, in certain geographic areas or centers. What are the conditions for this, in Erasmus as pre-conditions, so to say, and in his legacy, or the legacy of the more complex circle and network around him?



## 1. Erasmianism

It is appropriate to begin this recognition by clarifying its framework, that is, by addressing the cultural dimension of Erasmus’ scientific impact and recounting the various meanings that have so far been attached to the controversial label of ‘Erasmianism’. It was originally devised to encompass the direct repercussions of Erasmus’ experience on both his own and the following generations of European intellectuals. As a matter of fact, expressions such as *Erasmianus*, *Erasmicus* or Ἐρασμιανός already circulated during Erasmus’ lifetime. However, they referred rather to a ‘camp’ than to a ‘school.’ This camp emerged as a reaction to cultural polemics over issues ranging from Latin style to the opposition between evangelism and Scholasticism. As Marcel Bataillon has observed, these expressions often received an affective connotation rather than a doctrinal<sup>1</sup>. Erasmus’ own veto against all ‘-isms’ dividing Christianity into countless

<sup>1</sup> Marcel Bataillon, “Vers une définition de l’Erasmisme,” repr. in *Erasme et l’Espagne*, 141-54, 141-42. In this line see *El Erasmismo en España. Ponencias del coloquio celebrado en la Biblioteca de Menéndez Pelayo*, ed. Manuel Revuelta Sañudo and Ciriaco Morón Arroyo (Santander: Sociedad Menéndez Pelayo, 1986).

sects and factions (e.g., the different theological groupings within Scholasticism, the national Churches as well as Lutherans and ‘papists’) was directed against the instrumental use of his name to indicate a determined religious position:

“Ego nec Reuchlinista sum nec ullius humanæ factionis. Ista dissidii nomina detestor. Christianus sum et Christianos agnosco; Erasmistas non feram”<sup>1</sup>.

Erasmus’ *caveat* does not imply that a more or less coherent Erasmian movement could not emerge independently of his intentions. And there seems to be a wide consensus among scholars that it existed in fact. Its main characteristic was anti-dogmatism, directed against rigid doctrinal definitions. ‘Erasmians’ promoted irenic values and pitted humanistic literacy against Scholastic theology, Inquisitorial practices and political-religious armed conflicts. Moreover, they often embraced skeptical humanism, which Richard H. Popkin famously regarded as a major driving intellectual force in the Early Modern Period<sup>2</sup>. Although geographically differentiated, they shared a tendency to unify the European republic of letters. Historically, Erasmianism reached its peak in the time between the publication of the *Enchiridion militis Christiani* (1503) and the counter-reformist attempt at Erasmus’ “spiritual death” (*morte spirituelle*) decreed by his inclusion in the Index.

In general, Bataillon pleaded for a non-rigid employment of the category of Erasmianism to indicate a fruitful field of historical investigation and to open up novel reflections on modern culture. “La notion d’érasmisme, dès lors qu’on renonce à en faire une hérésie formulable par des définiteurs, est un thème de recherches fécondes qui sont loin d’avoir épuisé l’influence d’Érasme sur la vie spirituelle des siècles dits modernes”<sup>3</sup>. He saw the expression ‘Erasmisme’ as a useful heuristic category, aimed at the inquiry of early-modern scholarship inspired by the example and the values of Erasmus. Nevertheless, its very

<sup>1</sup> Allen, ep. 1041 (1519), vol. 4, 121.

<sup>2</sup> Richard H. Popkin, *The History of Scepticism from Erasmus to Descartes* (Assen: Van Gorcum, 1960). On Erasmus’ skepticism, its meaning and scope, see Enrico Pasini, “Dubbio e scetticismo in Erasmo da Rotterdam”, in *Erasmo da Rotterdam e la cultura europea. Erasmus of Rotterdam and European Culture*, ed. E. Pasini and P.B. Rossi (Firenze: SISMEL and Edizioni del Galluzzo, 2008) 199-250.

<sup>3</sup> Bataillon, “Vers une définition de l’Erasmisme,” 153.

usefulness for intellectual history has been casted into doubt by later scholars. Among them Karl A. E. Enenkel, the prominent historian of the reception of Erasmus, has radically questioned its meaningfulness: “If one tries to figure out what the term ‘Erasmianism’ contributes to our understanding of the underlying processes of reception, it is almost impossible to give an answer. The term certainly does not cover the whole of the reception of Erasmus, but only those intellectuals who were very close to Erasmus and subscribed to his central ideas”<sup>1</sup>. Accordingly, ‘Erasmianism’ should be referred to those who closely worked in contact with Erasmus or belonged to circles where his influence was particularly incisive.

A more positive assessment of ‘Erasmianism’, alongside a clearer definition of its semantic area, can be found in Cornelis Augustijn’s “*Verba valent usu: was ist Erasmianismus?*” (1997)<sup>2</sup>. This essay was specifically aimed to classify the groups that can be legitimately called ‘Erasmian’ during Erasmus’ lifetime and to consider whether they could constitute the basis for an enduring Erasmian tradition. Augustijn argued that the label ‘Erasmianism’ could be first applied to a *wissenschaftliche Partei*, by which he especially meant a scholarly network of humanists. The main characteristics of this ‘scientific party’ were, according to him, the commitment in favor of the *bonæ litteræ*, the merging of *bonæ litteræ* and *sacræ litteræ*, and a partiality for playful irony<sup>3</sup>. Secondly, ‘Erasmianism’ could apply to a movement for Church renovation (*Erasmismus als Reformbewegung*)<sup>4</sup>. Erasmus’ criticism of the corruption of costumes and the appeal for a moral rectification of Christianity offered strong arguments in favor of the early reformers. In protestant circles, especially in Switzerland and England, the view was spread according to which Erasmus’ emendation of the letters and of morality from corruption paved the way to the Reformation<sup>5</sup>. This connection weighted on the reception (and censure) of Erasmus in

<sup>1</sup> Karl A.E. Enenkel, *The Reception of Erasmus in the Early Modern Period* (Leiden and Boston: Brill, 2013), 9.

<sup>2</sup> Cornelis Augustijn, “*Verba valent usu: was ist Erasmianismus?*”. In *Erasmianism: Idea and Reality*, ed. Marianne E.H.N. Mout, Herbert Smolinsky and Johannes Trapman (Amsterdam: North Holland, 1997), 5-14.

<sup>3</sup> *Ibid.*, 7.

<sup>4</sup> *Ibid.*, 8.

<sup>5</sup> Cf. Bruce Mansfield, *Phoenix of His Age: Interpretations of Erasmus (c. 1550 – 1750)* (Toronto: Uni-

Catholic countries<sup>1</sup>. Hence, a convergence resulted between this sense of Erasmianism and the Reformation—this is also evidenced by the fact that many of Erasmus’s supported Luther. Thirdly, Erasmianism acquired a political meaning as the proposal of a pacific solution for the conflicts linked with the raise of Lutheranism. For this case Augustijn used the expression *politischer Erasmianismus*. However, a solution taking a stance above the confessional parties became impossible after the 1540s, when the religious fronts crystallized<sup>2</sup>. As a consequence, the political dimension of Erasmianism soon vanished.

As far as the reception of Erasmus is concerned, according to Augustijn, reformist and political Erasmianism lost its meaning already one generation after Erasmus, while scholarly Erasmianism evolved into an eclectic humanistic movement in which his legacy was diluted<sup>3</sup>:

“Für eine spätere Zeit [after Erasmus’ death] genügt mir die anspruchslose Formulierung ‘Einfluß des Erasmus’, die Raum für andere Einflüsse offenhält und sich von jeder Behauptung einer Monokausalität fernhält”<sup>4</sup>.

In examining the reception of Erasmian teachings and mindset in the scientific culture of his age, we should keep in mind this admonishment. It does not require us to dismiss the investigation of the presence of Erasmus’ influence and legacy in modern cultural developments. Rather, it should help us understanding the subtleties of reception, and adopting an open concept of Erasmianism and, consequently, of Erasmian ‘science’. While avoiding *Monokausalität*, i.e., mono-causal explanations, we should assess the cultural processes of appropriation of Erasmus’ legacy as an eclectic and inclusive cultural phenomenon.



versity of Toronto Press, 1979), chap. 3, “Protestantism: Erasmus and the Patterns of Reformation.”

<sup>1</sup> See Silvana Seidel Menchi, *Erasmus in Italia* (Torino: Bollati Boringhieri, 1987).

<sup>2</sup> Augustijn, “*Verba valent usu: was ist Erasmianismus?*”, 12.

<sup>3</sup> *Ibid.*, 11: “Die [Erasmusschule] gab es aber nicht.”

<sup>4</sup> *Ibid.*, 14.



## 2. Philology and natural science

To raise the question of Erasmian ‘science’ requires to narrow the focus of the investigation from the broadest context of reception to the more specific question of the relationship between Erasmian humanism and Early-Modern science. It was Kristeller who famously wrote:

“Renaissance humanism as such was not Christian or pagan, Catholic or Protestant, scientific or antiscientific, civic or despotic, Platonist or Aristotelian, Stoic or Epicurean, optimistic or pessimistic, active or contemplative, although it is easy to find for any of these attitudes, and for many others, a certain number of humanists who favored them. What they all have in common, is something else: a scholarly, literary, and educational ideal based on the study of classical antiquity”<sup>1</sup>.

Of this attitude and of its flagship science—that is, of philology—the general relevance for Renaissance science is beyond doubt. Back in the 1970s, Paul Lawrence Rose convincingly argued for the foundation of Renaissance mathematics on classical learning, in that age that goes from Regiomontanus and Copernicus to Commandino and Galileo. He especially indicated patronage, the formation of large libraries of classics and translations, as important factors in a rediscovery of classical antiquity that also included mathematics<sup>2</sup>. Rose limited his investigation to the “Italian Renaissance of Mathematics”, leaving for later scholars an inquiry of other *scientific* disciplines, such as physics and medicine, in a wider European context. Recent studies have provided more accurate accounts of the hybrid roots of the humanistic Archimedean Renaissance as a *transformation of Antiquity*<sup>3</sup>. Likewise, in medical history the expression ‘med-

<sup>1</sup> Paul Oskar Kristeller, “Studies on Renaissance Humanism During the Last Twenty Years”, *Studies in the Renaissance* 9 (1962): 7-30, 22.

<sup>2</sup> Paul L. Rose, *The Italian Renaissance of Mathematics: Studies on Humanists and Mathematicians from Petrarch to Galileo* (Genève: Droz, 1975), especially 26 f. and chap. 2, “Patrons, Collectors and Translators: Humanist Origins of the Mathematical Renaissance.”

<sup>3</sup> Jürgen Renn and Peter Damerow, “The Transformation of Ancient Mechanics into a Mechanistic World View,” in *Transformationen antiker Wissenschaften*, ed. Georg Toepfer and Hartmut Böhme (Berlin: de Gruyter, 2010), 243-68 and *The Equilibrium Controversy: Guidobaldo del Monte’s Critical Notes on the Mechanics of Jordanus and Benedetti and their Historical and Conceptual Background* (Berlin: epubli, 2012).

ical humanism' has established itself<sup>1</sup>, and, more in general, the connection of scientific practices and humanist education is well-attested up to the 17<sup>th</sup> century<sup>2</sup>. But as to the specific Erasmian constituent of European humanism, this theme has so far been neglected by most historians of science.

In reality, although textual criticism and scientific philology will always be intended in Erasmian tradition to the restoration of the Scriptures as a basis for Christian reform, Erasmus was not uninterested in the scientific writings of the ancients<sup>3</sup>. Nevertheless, his concern was mainly, again, philological: “Galeno sane faves meritissimo; sed discrucior tantum auctorem tantis impendiis tam mendose proditum, qualia fere sunt quae novis nunc prodeunt ex Italia”<sup>4</sup>.

But this can already be considered a factual contribution. And with respect to the wider geography of Erasmus' legacy, on a European scale the influence of Erasmian humanism on scientific advance can prove most noticeable<sup>5</sup>. The relevance of his introduction to the *editio princeps* of Ptolemy's *Geography* (1533) should not be underestimated. As Klaus Vogel has pointed out, not only does this show Erasmus' attention to the epistemic shifts of this discipline linked to oversea navigation, to the point that he asserted that “hardly any other of the mathematical disciplines is more attractive or more necessary”<sup>6</sup>. Erasmus' in-

<sup>1</sup> See e.g. Hiro Hirai, *Medical Humanism and Natural Philosophy, Renaissance Debates on Matter, Life and the Soul* (Leiden-Boston: Brill, 2011).

<sup>2</sup> Witness to it is e.g. the permanence of the commonplace books: besides the well-known example of Isaac Newton, see Edward H. Cohen and John S. Ross, “The Commonplace Book of Edmond Halley”, *Notes and Records of the Royal Society of London* 40 (1985): 1-40; in general, Ann Blair, “Humanist Methods in Natural Philosophy: The Commonplace Book”, *Journal of the History of Ideas* 53 (1992): 541-51; see also Lorraine Daston, “Taking Note(s)”, *Isis* 95 (2004): 443-48.

<sup>3</sup> “Erasmus besass die Gesamtausgabe der *Astronomici veteres*, Ald. 1499” (ASD II-3, 57 n.).

<sup>4</sup> Allen, ep. 2049 (1528), vol. 7, 497.

<sup>5</sup> It can be remarked by the way that the anti-vernacular attitude of Erasmus is not an obstacle in respect to the elitist circulation of scientific writings. From Paracelsus' teaching in Swiss-German to Stevin's advocacy of Low-German as language of choice, even better than Greek, for mechanics—on which see Eduard J. Dijksterhuis, *Simon Stevin. Science in the Netherlands around 1600* (The Hague: Martinus Nijhoff, 1970), 126-29—the idea of using one's own modern language in science shall win Europe; but the real diffusion of scientific knowledge, with the notable exception of Italian, is still left to Latin, even in the case of Stevin, whose linguistic ideas of *Belgica praeeminentia* “in Mathematicis disciplinis describendis” will paradoxically be read mostly if not only in the Latin translation (*Hypomnemata mathematica a Simone Stevino conscripta et e Belgico in Latinum a Wilebordio Snellio conversa*, Lugduni Batavorum, ex Officina Ioannis Patii, 1608: De Cosmographia, Volume 1, 21-22).

<sup>6</sup> Claudius Ptolemæus, *De Geographia libri octo* (Basel: Froben, 1533), f. 3r. Cf. Klaus Vogel, “Cos-

roduction legitimated the efforts of the Basle community of scholars and printers in making fundamental works of ancient science available to the learned community—among them, the *editiones principes* of Euclid’s *Elements* with Proclus’s commentary (1533) and Ptolemy’s *Almagest* (1538) based on a copy that cardinal Bessarion had transmitted to Regiomontanus.

One could refer to the early-modern circulation of pseudo-Proclus’s *Sphere* as a particular case showing the authoritative position acquired by Erasmus and his entourage during the Renaissance. This brief introduction to the main concepts of spherical astronomy—which is, in fact, a selection of chapters from Geminus’ *Introduction to the Phenomena*—was wrongly attributed to Proclus in the Aldine edition of 1499 and appeared in the Latin translation by Erasmus associate, the English physician Thomas Linacre. It met with incredible success and was reprinted several times. It is very likely that in this case the *authority* of the Erasmian elite was the reason for the endurance of an ill-founded attribution of authorship and the wide dissemination of a spurious work on spherical astronomy among learned humanists throughout Europe<sup>1</sup>.

The connection between Erasmianism and mathematics is difficult to assess and ambivalent<sup>2</sup>. In fact, although Erasmus did not directly contribute to that field, Erasmianism might have served as a fertile ground for mathematical studies. For instance, it can be argued that an entangled reception of Erasmus and Cusanus accompanied the Lefèvrean movement of mathematical studies in France and rebounded then, as Richard Oosterhoff shows in his contribution to this issue, on the Basle circles around Erasmus.

In addition, Erasmus’s contribution to the editorial culture of his time raises a question about his role in the development of scientific editions and, more in general, of the intertwining of modern science and printing. How did his editorial standards, including the employment of images, enter the scientific

mography”. In *The Cambridge History of Science*, vol. 3, *Early Modern Science*, ed. Karin Park and Lorraine Daston (Cambridge: Cambridge University Press, 2006), 469-96, 469.

<sup>1</sup> Cf. Robert B. Todd, “The Manuscripts of the Pseudo-Proclan Sphæra”, in *Revue d’histoire des textes* 23 (1993): 57-71.

<sup>2</sup> The reputed mathematician Francesco Maurolico even criticized Erasmus as an enemy of both mathematics and faith; however, this harsh judgment seems to be especially linked to the particular counter-reformist environment of this mathematician of Greek origins working in Messina (see Rose, *Italian Renaissance of Mathematics*, 174).

production of the sixteenth and seventeenth centuries? Although a ‘defender of the text’<sup>1</sup>, Erasmus appreciated astronomical diagrams enough to write in 1528 the following distich: “Quae vix loquaci disceres volumine, | Brevis en tabella ponit ob oculos tibi”<sup>2</sup>—which was not an obvious move for the most prolific advocate of *copia* in learned Europe.

### 3. Circles

Did Erasmianism also provide the background for the reinforcement of practical and mixed mathematics in Germany and the Netherlands within a humanistic environment? A sceptical answer to this and similar questions is provided by Nathan Ron’s contribution to this issue. But such concerns also raise the question of Erasmus’ both personal and literary circles: f.i., he was notably uninterested in the developments of music as far as they would return the participants to sacred rites<sup>3</sup>; but his close pupil and friend Glareanus was a renowned music theorist<sup>4</sup>, and was considered by Erasmus a consummate mathematician, to the honor both of his friend and of the completeness of his knowledge:

“Est apud nos Henricus Glareanus Caesarea laurea insignis (...) In omnibus disciplinis quas mathematicas vocant eximie doctus neque vulgariter exercitatus. In omni quae nunc in scholis traditur Aristotelica philosophia eo progressus ut cum summatibus etiam congrredi possit. Magnam insuper theologiae rei partem assecutus. In geographia, in

<sup>1</sup> In the sense of the well-known work by Anthony T. Grafton, *The Defenders of the Text. The Traditions of Scholarship in an Age of Science, 1450–1800* (Cambridge, MA: Harvard University Press, 1991).

<sup>2</sup> ASD I-7 245. It was to accompany a figure that should have appeared in Joachim van Ringelberg’s *Institutiones astronomicae*, for which Erasmus also wrote a short *carmen gratulatorium*.

<sup>3</sup> See Jean-Claude Margolin, *Érasme et la musique* (Paris: Vrin, 1965); an improved and expanded version in his *Recherches érasmienne* (Genève: Droz, 1969).

<sup>4</sup> Glareanus offered in musical theory an almost definitive codification of modality, although his work was irrelevant in the process of ‘quantifying music’ (Hendrik Floris Cohen, *Quantifying Music: The Science of Music at the First Stage of Scientific Revolution 1580–1650*, Dordrecht: Reidel 1984). He also proposed in his works the traditional connection of music and astronomical spheres; see Joscelyn Godwin, *The Harmony of the Spheres: A Sourcebook of the Pythagorean Tradition In Music* (Rochester, VT: Inner Traditions, 1993), 196 f.

historiis absolutus. Denique nullum est genus bonarum litterarum in quo ille non sit felicissime versatus”<sup>1</sup>.

Both dimensions harmonize in his writings: not only Erasmus never hints to any defect of his friend’s prose, but in the *Ciceronianus* it is the Ciceronian Nosoponus who comments unfavourably on Glareanus’ mathematical inclinations: “Is maluit in philosophia ac Mathematicis disciplinis consenescere, quam aemulari phrasim Ciceronianam, cui vix convenit cum subtilitatibus Mathematicorum”<sup>2</sup>. And in the same *Ciceronianus* Erasmus states: “Nulla est ars humana, cui non concedimus ius utendi suis vocabulis: licet grammaticis dicere, supinum et gerundium: mathematicis sesquialteram, et superbi-partientem”<sup>3</sup>.



Mathematical and natural knowledge, according to Erasmus, are indeed necessary to the completeness of education, as we read in his *De ratione studii*:

“Tenenda cosmographia, quae in historiis etiam est usui, nedum in poetis. Hanc brevissime tradit Pomponius Mela, doctissime Ptolemaeus, diligentissime Plinius. Nam Strabo non hoc tantum agit. Hic praecipua pars est observasse quae montium, fluminum, regionum, urbium vulgo recepta vocabula, quibus antiquis respondeant. Eadem debet esse cura in arborum, herbarum, animantium, instrumentorum, vestium, gemmarum nominibus, in quibus incredibile dictu quam nihil intelligat literatorum vulgus. Horum notitia partim e diversis auctoribus, qui de re rustica, de re militari, de architectura, de re culinaria, de gemmis, de plantis, de naturis animantium conscripserunt, colligitur”<sup>4</sup>.

<sup>1</sup> Allen, ep. 394, vol. 2, 208.

<sup>2</sup> ASD I-2, 688-89. Of course Glareanus might seem to be, from Erasmus’ point of view, an exception; but also the superiority of Hieronymus on Augustine is argued by Erasmus on the basis of the former’s knowledge of “tota philosophia”, including Aristotle’s logical writings and those “de Physicis aut Metaphysicis” (Allen, ep. 844, vol. 3, 336).

<sup>3</sup> ASD I-2, 643.

<sup>4</sup> ASD I-2, 122-23.

These examples of a positive attitude towards these branches of knowledge, from which Erasmus is albeit estranged<sup>5</sup>, can be seen as elements of a wider scheme. To John Carondelet, Erasmus writes a letter that will become the preface to his edition of Hilary (*Hilarii Opera*, Basle: Froben, 1523). He recalls here how “Socrates Atheniensis (...) philosophiam a contemplatione rerum naturalium in mediam hominum vitam deduxit”. But Erasmus’ discourse is based here not simply on debasing the knowledge of natural things:

“Et tamen de naturis syderum, de motu coelestium orbium, de fulminibus, de ventis, de iride deque similibus rebus, quoniam ad id initia cognitionis suppeditant vel sensus ipsi corporum vel effectuum experientia, multa certo deprehenduntur, et in primis iucunda cognitio est, et in admirationem simul et amorem opificis subvehit; attamen quoniam vir sapiens animadvertit in huiusmodi studio totam aetatem homines desiderare, neglectis interim his quae propius ad nos pertinent, a contemplatione rerum naturalium omne studium ad mores devocavit. At ea quae nos scrutamur, quae definimus, interdum nec sacris literis prodita sunt, ut si comprehendi non possint, certe credi debeant; nec ullis rationibus idoneis probari nec cogitatione concipi, nec similibus adhibitis adumbrari, ut sunt, possunt. In quibus vestigandis, quum a felicissimis ingeniis summa vi diu desudatum fuerit, hic demum est extremus profectus, ut intelligant se nihil scire: et adeo ad vitae pietatem nihil faciunt, ut nusquam magis habeat locum illud Pauli, ‘Scientia inflat, charitas aedificat’”<sup>1</sup>.

We are not confronted here just with the Agrippan theme of the vanity of knowledge, that opposes salvation to the practice of mathematical and natural inquiry<sup>2</sup>, but in this text we can rather identify—alongside the usual and always timely idea that “summa nostrae religionis pax est et unanimitas”—a quite sophisticated polemic against the “inscita scientia”, that really implies and suggests an ethos of the scientific enterprise of mundane learning:

<sup>5</sup> It is banal to say that he was not a natural scientist, nor really interested in the exactness of the related competence: “[Erasmus] verwendet aber auch sonst naturkundliche Begriffe ungenau” (ASD II-4, 253 n.)

<sup>1</sup> *Allen*, ep. 1334, vol. 5, 177. We can recognize here symptoms of the inception of that phenomenon pointed by Sorana Corneanu in her *Regimens of the Mind: Boyle, Locke, and the Early Modern cultura animi Tradition* (Chicago: University of Chicago Press, 2011).

<sup>2</sup> Erasmus shows no prejudice against a mathematical vocation even in the education of children: “est natura huic aut illi peculiaris veluti quosdam mathematicis disciplinis, alios theologiae, has rhetoricae aut poeticae, illos militiae natos dicas” (*De pueris instituendis*, ASD I-2, 44).

“Nisi mundum cor habuero, non videbo Deum. Hoc igitur totis studiis agendum erat, hoc meditandum, hoc urgendum, ut livore, ut invidia, ut odio, ut superbia, ut avaricia, ut libidine purgem animum. (...) Non quod in totum damnandam existimem vel philosophiae in tres partes dissectae vel rerum ultramundandarum vestigationem, modo adsit ingenium felix, et absit definiendi temeritas, absit pervicacia et concordiae pestis, vincendi pertinax libido”<sup>1</sup>.

The knowledge of nature is thus necessary to the completeness of one’s culture. Conversely, erudition is not divination: the study of nature is open to everyone<sup>2</sup>; in general, in Erasmus and his associates we meet rather with the independence of natural knowledge than to its subordination to divinities—an attitude clearly different from that Mosaic (or ‘sacred’) physics, that will gain so much momentum in the 17<sup>th</sup> century<sup>3</sup>

It is well known that Erasmus also gave a very positive judgement of medicine. His circles, accordingly, comprised a number of humanist physicians—like f.i. Euricius Cordus (Heinrich Ritze) of Simtshausen in Upper Hesse (1486-1535), a peasants son grown to become an Erasmian humanist, poet and teacher, who eventually studied medicine and wrote on botany; or Helius Eobanus Hessus (1488-1540), author of an “Erasmian prose colloquy entitled *Melaenus* in which he praised medicine against the reformers, attributing to them the view that academics ‘Medicinam corporum falsam et apparentem quaeritis, veram et magis appositam animarum negligitis’”<sup>4</sup>; or William Cop, the importance of whose relation to Erasmus is adequately stressed in Simone Mammola’s contribution to this issue. Finally, from the wide Erasmian *cercles* could also issue novel contri-

<sup>1</sup> Allen, ep. 1334, vol. 5, 177. We can recognize here symptoms of the inception of that phenomenon pointed by Sorana Corneanu in her *Regimens of the Mind: Boyle, Locke, and the Early Modern cultura animi Tradition* (Chicago: University of Chicago Press, 2011).

<sup>2</sup> See Jean-Claude Margolin, *L’idée de nature dans la pensée d’Erasmus*, Vorträge der Äneas-Silvius-Stiftung an der Universität Basel, 7 (Basle: Helbing and Lichtenhan, 1967), then in *Recherches érasmiennes*.

<sup>3</sup> See Ann Blair, “Mosaic Physics and the Search for a Pious Natural Philosophy in the Late Renaissance”, *Isis*, 91 (2000): 32-58.

<sup>4</sup> Dirk Sacré, “*Medicinae laus per Eobanum Hessum ex Erasmo, versus reddita* Reassessed”, in *The Reception of Erasmus in the Early Modern Period*, ed. Karl A.E. Enenkel (Leiden and Boston: Brill 2013), 41-82, 47. “This intimates a divine justification of medicine, and may be considered a pointed observation in the intellectual climate of Erfurt, hostile to the arts and sciences and solely interested in the salvation of the souls” (*Ibid.*, 63).

butions to the foundation of unexplored branches of knowledge, as Francesco Sacco's contribution to this issue aims to show in the case of Agricola.

## 4. Networks

A central element that has to be taken into account to assess Erasmus' legacy in the scientific culture of the Early Modern Period is the establishment of his scholarly network. Owing to it, the set of humanistic values shared by his associates were reinforced as an element of collective identity, which also implied a specific scientific deontology and an *ethics of knowledge*. In this respect, it is worth mentioning that the cultural environment of Nicholas Copernicus in Poland was markedly influenced by Erasmian humanism. The intellectual milieu of Varmia, where he was a canon, comprised a large group of admirers of Erasmus: Alexander Scultetus, Feliks Reich, Achacy Trenck and, last but not least, the bishop of Chełmno and Varmia, i.e. Tiedemann Giese.

Giese, the close friend of Copernicus who encouraged him to finalize the publication of *De revolutionibus*, considered himself a pupil of Erasmus and used to say that he could renounce fire and bread but not his master's books<sup>1</sup>. According to the later witness of the Cracovian mathematician Johannes Broscius, Giese communicated Copernicus's heliocentric theory to Erasmus: "I saw the still unprinted *Apology* [*Hyperaspisten*] for Nicholas Copernicus by the Bishop of Chełmno Tiedemann Giese in which Tiedemann himself mentions Erasmus of Rotterdam's rather temperate opinion on Copernicus"<sup>2</sup>.

Moreover, Copernicus and Giese shared an Erasmian reformist and political attitude toward confessional conflicts. The former supported an irenic work of the latter entitled *Anthelogikon*: "Nicholas Copernicus—as Giese declared—prompted the publication of those trifles of mine"<sup>3</sup>. Erasmian tolerance and

<sup>1</sup> Teresa Borawska, *Tiedemann Giese (1408-1550) w życiu wewnętrzym Warmii i Prus królewskich* (Olsztyn: Wydawn. Pojezierze, 1984), part. 303 f., "Giese a reformacja i reformatorzy".

<sup>2</sup> Cf. Hooykaas, G. J. *Rheticus' Treatise on Holy Scripture and the Motion of the Earth* (Amsterdam-New York: North-Holland, 1984), 26 n. 45.

<sup>3</sup> See Andrzej Kempfi, "O dwu edycjach Anthelogikonu Tidemana Gisiego: Z historii warmińskich polemik reformacyjnych w czasach Mikołaja Kopernika", in *Kopernik na Warmii: życie i działalność publiczna; działalność naukowa; środowisko; kalendarium*, ed. Janusz Jasiński (Olsztyn: Wydział Kul-



openness animated two apologetic writings arguing for the reconcilability between the heliocentric system of Copernicus and the Sacred Scriptures: Giese's *Hyperaspisten*, now lost, and Rheticus's tract presently known as *De Terræ motu et Scriptura Sacra*.

Copernicus himself was a reader of Erasmus<sup>1</sup>. As Fernand Hallyn has demonstrated, some passages of *De revolutionibus* are derived from Erasmian sources. But this is less relevant than the influence of Erasmian 'method' and scientific ethics on the most visible Renaissance astronomer:

“C'est que, au-delà de l'influence ponctuelle exercée par les humanistes qui fournissaient de nouvelles éditions et traductions des ouvrages anciens, il existe une parenté profonde entre la pratique philologique d'un Erasme et l'activité astronomique de Copernic. Par son exigence de liberté et d'esprit critique, son retour aux faits, aux sources, l'attitude des humanistes est analogue à celle de Copernic. Tout comme Lorenzo Valla, Politien ou Erasme veulent restituer le texte véritable des Anciens et de la Bible, ainsi Copernic a pour dessein de reconstituer la texture véritable du monde”<sup>2</sup>.

Copernicus's case makes clear that Erasmus' influence is not far removed from the epicenter of some of the most important achievements in the history of science. It is remarkable how little attention was paid to the cultural meaning of this Erasmian heritage in past 'grand narratives' about the Scientific Revolution.

## 5. Institutions

One more aspect should be taken into consideration: the institutional dimension. Networks are not enough to ensure the transmission and endurance of ideas, perspectives and values. They have to be stabilized through institutional settings. Although Erasmus was not a man of institutions, he fostered institutional transformations. The most enduring of these innovations concerned

tury Prezydium Wojewódzkiej Rady Narodowej, 1978), 417-426, 422. See also Leopold Prowe, *Nicolaus Copernicus* (Berlin: Weidmann, 1883-1884), vol. I/2, 167-87, “Copernicus und sein Freundes-Kreis in ihrer Stellung zur Reformation”.

<sup>1</sup> Ludwik Antoni Birkenmajer, *Mikołaj Kopernik: Studya nad pracami Kopernika oraz materyiały biograficzne* (w Krakowie: w Drukarni Uniwersytetu Jagiellońskiego, 1900), 568.

<sup>2</sup> Fernand Hallyn, “Copernic et Erasme”, *Humanistica Lovaniensia: Journal of Neo-Latin Studies* 49 (2000): 89-100, 99.

universities. Erasmus and his friends John Colet and Thomas More's efforts to establish the teaching of Greek in Cambridge and Oxford were a success. Some of the humanists of the next generations trained in this renewed context, also played a crucial role in the development of mathematical-scientific culture on British soil. But there is not an opposition between the literary and the scientific aspects of higher education in the eyes of Erasmus himself, as it appears from what he wrote to Henry Bullock in 1516 commenting these improvements:

“Ante annos ferine triginta nihil tradebatur in schola Cantabrigiensi praeter Alexandrum, Parva Logicalia, ut vocant, et vetera illa Aristotelis dictata Scoticasque questiones. Progressu temporis *accesserunt bonae literae: accessit matheseos cognitio: accessit novus aut certe novatus Aristoteles: accessit Graecarum literarum peritia: accesserunt autores tam multi, quorum olim ne nomina quidem tenebantur nec a summatibus illis larcis*”<sup>1</sup>.

It was a scholar of Greek, Henry Savile, who brought from Europe to England a thorough knowledge of Copernicus's astronomical work and funded the Oxford “Savilian professorships” for astronomy and geometry based on continental examples<sup>2</sup>.

Erasmus also supported the foundation of the *Collegium trilingue* of Louvain, where Greek, Latin and Hebrew constituted the basis for a humanistic and theological education realizing the fusion of *bonæ litteræ* and *sacræ litteræ* at the level of teaching curricula. Louvain served as a model for further humanistic and late-humanistic universities, beginning with Paris. Here, the Greek scholar Guillaume Budé used the same trilingual model for the the *Collège Royal*. Finally, the humanistic reform of Lutheran Universities under Philipp Melanchthon, followed a similar pattern. In the intentions of the *præceptor Germaniæ*, the teaching of the three languages should not be disjointed from those of natural philosophy, mathematics and astronomy<sup>3</sup>.

Melanchthonian late humanism had a beneficial effect on the development

<sup>1</sup> Allen, ep. 456, vol. 2, 328 (our emphasis). See also Paul Lawrence Rose, “Erasmians and Mathematicians at Cambridge in the Early Sixteenth Century”, *The Sixteenth Century Journal* 8 (1977): 46-59.

<sup>2</sup> Cf. Owen Gingerich, *An Annotated Census of Copernicus' De Revolutionibus (Nuremberg, 1543 and Basel, 1566)* (Leiden-Boston: Brill, 2002), 258.

<sup>3</sup> Walter Rüegg (ed.), *Geschichte der Universität in Europa*, vol. 2, *Von der Reformation bis zur Französischen Revolution (1500-1800)* (München: Beck, 1996), 370-72.

of scientific scholarship, mathematics, astronomy and medicine in the German cultural area. The dissemination and reworking of Copernican astronomy is telling of the synergy of letters, mathematics and theological reform that become possible in a vast middle and Northern European area:

“In the Erasmian age, however, humanist formation began slowly but steadily to take hold of the entire grammar school teaching in the Netherlands, and, as a logical consequence, of a broad range of academic and scientific life. The time was coming when jurisprudence, medicine, mathematics, and other disciplines would be practised by men trained as humanists, a transformation which would affect not merely the language of their writings but also their scientific methods, their teaching, and their research”<sup>1</sup>.

Up to the Thirty Years War the network of Philippist institutions had far reaching impact even over the Baltic area and the British Islands. Such foreign mathematicians and physicians as John Craig and Duncan Liddel were trained and taught at German universities—Wittenberg, Rostock, Frankfurt on Oder, Helmstedt, Königsberg—and acted as cultural mediators with their own country. Craig became a physician to a learned King such as James VI of Scotland and I of England; Liddel first studied at Frankfurt on Oder, later entered middle European humanistic circles (such as the Wrocław-circle of Andrea Dudith), became a professor of mathematics at Rostock and Helmstedt, and finally returned to his hometown Aberdeen where he endowed a chair of mathematics at Marischal College in 1613 based on the model of Melanchthonian universities<sup>2</sup>.

It is relevant to stress at this point Melanchthon’s overt acknowledgment of the relevance of the Erasmian legacy for his reform of university curricula. This is particularly remarkable since he did not renounce the legacy of the ‘master’ of his youth, despite his theological disputes with Luther. As it has been said, “in

<sup>1</sup> Jozef Ijsewijn, “The Coming of Humanism to the Low Countries”, in *Itinerarium Italicum: The Profile of the Italian Renaissance in the Mirror of Its European Transformations*, ed. Heiko A. Oberman and Thomas A. Brady, jr., *Studies in Medieval and Reformation Thought*, 14 (Leiden: Brill, 1975), 193-301, 277-78. See also Lewis W. Spitz, *The Course of German Humanism*, *ibid.*, 371-435; Robert S. Westman, “The Melanchthon Circle, Rhetoric and the Wittenberg Interpretation of the Copernican Theory,” *Isis* 66 (1975): 163-93; Karin Reich, “Philip Melanchthon im Dialog mit Astronomen und Mathematikern: Ausgewählte Beispiele,” in *Mathematik und Naturwissenschaften in der Zeit von Philipp Melanchthon*, ed. Franz Fuchs (Wiesbaden: Harrassowitz, 2012), 27-58.

<sup>2</sup> Pietro D. Omodeo, “L’iter europeo del matematico e medico scozzese Duncan Liddel,” *Preprints of the Max Planck Institute for the History of Science* 438 (2013).

holding to Luther, he did not abandon Erasmus”<sup>3</sup>. In a posthumous declamation on Erasmus, Melanchthon indicated him as the example to be followed in the learning. He judged the Erasmian restoration of the *humanæ litteræ* to be a model of moral and scholarly virtue. He saw it as the providential preparation for Luther’s Reformation<sup>1</sup>.

Hence, Erasmus’ role for the formation and identity of circles and institutions of the late Northern European humanism should be reconsidered, especially in Reformed centers of the so-called *Späthumanismus*. A series of new questions emerge as prospects for further research: Could Philippism be regarded as a Lutheran outcome of Erasmus’ cultural guidelines? Can, on the contrary, certain strands of anti-Ramism, or the various unorthodox Ramisms, be interpreted as an Erasmian reaction to the anti-humanistic outlook of Petrus Ramus and his followers? How did Erasmian humanism circulate within Protestant academic institutions and how were their scientific curricula permeated by his views?

These latter considerations lead to the question about the ‘image’ of Erasmus, and the *ideas* it stood for, in the eyes of different readers, followers, and authors: it is plain, for instance, that Giordano Bruno’s heretically tinged admiration for him was radically different from that of ‘moderate’ Melanchthonians. The different components of the reception of Erasmus in the scientific discourse of the Renaissance need, we hope to show, closer examination.

## 6. Conclusion

This special issue of the *Journal of Interdisciplinary History of Ideas* is meant to begin answering all these questions and possibly launch new lines of investigation into the interaction between Erasmianism (in his various meanings) and the scientific discourse of the Renaissance. We are grateful to the authors who answered the call for papers with the valuable contributions that follow, to the journal itself for accepting to host this thematic issue, and to the editorial staff and many other friends for cooperation in putting it all together. We shall be at least as much grateful for criticism and suggestions from the readers.

<sup>3</sup> Mansfield, *Phoenix of His Age*, 89.

<sup>1</sup> *Ibid.*, 89-93.

## Abbreviations

Allen = *Opus Epistolarum Des. Erasmi Roterodami*, 12 vols., ed. Percy Stafford Allen, Helen Mary Allen and Heathcote W. Garrod. Oxford: Clarendon Press, 1906-1958.

ASD = *Erasmi Opera Omnia*, recognita ed adnotatione critica instructa notisque illustrata, Amsterdam: North Holland Publishing and Elsevier, 1969 f.



*Hans Holbein the Younger, The Ambassadors (1533), particular of the globe (upside down).*