

Julia V. Ivanova - Pavel V. Sokolov

***Physica ingeniosa* and Abyssinian philosophy:  
the Ambivalence of the Cartesian Physics  
in *De ratione, V* \***



Laboratorio dell'ISPF, XIII, 2016

This study can be identified as a modest *addendum* to the multidimensional and highly controversial image of Vico's approach to Descartes and Cartesianism, primarily in *De ratione* («On the Study Methods of our Time», 1709) – given the huge amount of research literature dealing with this topic, we can hardly eschew following the beaten path. Let us set aside the widely known directions of the Vichian criticism of Cartesianism – the destruction of the *cogito* in *De antiquissima*, the rhetorical dismissal of the Cartesian philosophy of *verum* – we shall focus on a particular moment in Vico's approach to Cartesian physics, examining it against the background of the methodological principles carried out by some Cartesian physicians themselves, with a particular emphasis on the relationship between Vico and Thomas Burnet. We intend to tackle an issue that could already seem over-studied – the distinctive Vichian epistemic turn, «transplantation of rhetoric beyond the polis»<sup>1</sup>, the use of the same cognitive tool, the metaphor, and the same faculty of soul, *ingenium*, in a variety of fields, seemingly very distant from one another: aesthetics and literary theory (theory of the Sublime), rhetoric, and physics. Being effectively over-studied in itself (*ingenium* in Vico looks like a *cliché* or rather a tautology<sup>2</sup>), this topic remains resourceful for scrutinizing Vico's singular way of handling with the rival theories: his paradoxical inclination to create the highly subjective and emotionally colored, often misleading and even self-contradictory images of his opponents.

Of Vico's projected *Hauptwerk* on physics, *Liber physicus*, only a small sketch has been preserved, so that we are constrained to glean the pieces of respective argumentation, disseminated through his different works: *De ratione* (1709), *De antiquissima* (1710), *Vita scritta da se medesimo* (1723/28), and *New science* (1725, 1730, 1744), with a particular focus on chapter five of *De ratione*. As everyone knows, Vico begins *De ratione* eulogically referring to Bacon – the figure of the *Verulamius* who has been explicitly associated with experimentalism, a method highly in vogue in *Seicento* Naples – in his youth Vico also paid tribute to it (let us remember his intimacy with the Neapolitan Epicureanism and relationship to the *Accademia degli Investiganti*)<sup>3</sup>. But this reference to the experimentalism goes hand in hand with the distinctive idea of the rhetorical re-equipment of physics: in a famous passage, Vico opposes the purely deductive proceeding of the «modern» (Cartesian) geometry, presupposing a

\* This study was supported by The National Research University - Higher School of Economics' Academic Fund Program of the Russian Federation in 2015-2016 (research grant No. 15-01-0161).

<sup>1</sup> D. L. Marshall, *Vico and the Transformation of Rhetoric in Early Modern Europe*, Cambridge, Cambridge University Press, 2010, p. 121.

<sup>2</sup> The main bibliography on this subject has been collected by Stefano Gensini (<[www.lettere.uniroma1.it](http://www.lettere.uniroma1.it)>).

<sup>3</sup> See N. Badaloni, *Laici credenti all'alba del Moderno. La linea Herbert-Vico*, Firenze, Le Monnier, 2005; J. Barnouw, *Vico and the Continuity of Science: The Relation of His Epistemology to Bacon and Hobbes*, in «*Isis*», 71, 1980, 4, pp. 609-620; M. Iannizzotto, *L'empirismo nella gnoseologia di Giambattista Vico*, Padova, CEDAM, 1968.

chain of reasoning whose links are connected very closely to each other, and the rapprochement of distant phenomena carried out by the *ingenium*.

Recentiores physicos omnes genere disserendi contento ac severo uti animadvertas: cumque haec physica, et quum discitur et quum percepta est, perpetuo ex proximis proxima inferat, eam auditoribus facultatem occludit, quae philosophorum propria est, ut in rebus longe dissitis ac diversis similes videant rationes: quod omnis acutae ornataeque dicendi formae fons et caput existimatur. Neque enim tenue idem est atque acutum: tenue enim una linea, acutum duabus constat. In acutis autem dictis principem obtinet locum metaphora, quae est omnis ornatae orationis maxime insigne decus et luculentissimum ornamentum<sup>4</sup>.

Later on, in his *Autobiography*, Vico corroborates the foundations of the «ingenious physics», drawing the analogy between the way *ingenium* acts in nature and its function within the set of anthropological faculties: «Now the Latins called nature *ingenium*, whose principal property is sharpness; thus imitating that nature forms and deforms every form with the chisel of air»<sup>5</sup>. The «acuity» operating both in physical and human nature, that the Egyptians symbolically represented in the form of a pyramid<sup>6</sup>, establishes the common ground for eloquence and natural philosophy, making it possible to exercise the faculty of invention in both the civil and physical worlds. Another well-known statement from a later Vichian treatise, *On the Most Ancient Wisdom of the Italians*, claims that the eloquence and «observational ability» of natural scientists spring from the same source (*ex iisdem fontibus, ex quibus copiosi oratores, et observatores etiam maximi provenire possint*). Along with inventive discovery, another common characteristic of physics and rhetoric is their belonging to the domain of the verisimilar (*verisimile*): whereas in rhetorical practice the «long chains of reasoning» from the *primum verum* to *vera secunda* engender boredom in the audience, in physics the *mos geometricus* fails to extend mathematical demonstration to the world of natural phenomena, because, in contrast to God, we do not «make» them; therefore, this method can only function as a sort of compositional tool (*a geometria methodum quidem habent, non demonstrationem*). Already in Vico’s *juvenilia*, that is, in his third inaugural speech, the application of geometry to physics served as an example of *dolus* or *mala fraus*<sup>7</sup>. This singular deficiency of modern «geometrical» physics, its unfounded claim of being the only reliable science has been emphasized several times in ulterior Vico writings. In the *New Science* (starting from the 1730 version), the physical

<sup>4</sup> G. Vico, *De nostri temporis studiorum ratione* (= *De rat.*), in Id., *Opere*, a cura di A. Battistini, Milano, Mondadori, 1990, vol. I, p. 116.

<sup>5</sup> *The Autobiography of Giambattista Vico*, transl. by M. H. Fisch and Th. G. Bergin, New-York, Cornell University Press, 1975, pp. 148-149.

<sup>6</sup> «From the word *coelum*, which means both “chisel” and “the great body of the air”, he conjectured that perhaps the Egyptians, by whom Pythagoras was instructed, had been of the opinion that the instrument with which nature makes everything was the wedge, and that this was what they meant their pyramids to signify» (*ibid.*, p. 149).

<sup>7</sup> G. Vico, *Le Orazioni inaugurali*, a cura di G. G. Visconti, Bologna, Il Mulino, 1982, *III Orazione*, p. 35.

world, the globe (*globo mondano*) on the «Dipintura», is represented as relying on the allegorical altar only by one side; as the author himself explained in the «Spiegazione», this was aimed at demonstrating the one-sidedness of contemporary physical science in contrast to the *scientia civilis*. In opposition to this analytical model of physical science, Vico displayed in the *New Science* his own «poetical physics», representing a mixture of civil history and natural science.

One of Vico's main arguments against the «modern» (that is, Cartesian) physics targets its fictitious character. If we compare the tartly characteristics of Descartes' scientific autobiography in *Vita* with Vico's treatment of the Cartesian-like Thomas Burnet's theory of the Earth in the *New Science* of 1725, we can easily discern a common thread: the denunciation of both accounts as merely fictional narratives. In *De ratione*, Vico argues that the constitutive application of the new physics would require «a radically new phenomenon as its corollary» (*aliquod novum phaenomenon explices, tanquam eiusdem physicae corollarium*)<sup>8</sup> – in my view, here we can see the echo of the idea of a «possible world», whose construction had been envisaged in Descartes' *Le monde*<sup>9</sup>. Vico considers two branches of Descartes' philosophy, which he quite characteristically describes as fictive narratives. These are the imaginary autobiography of the atemporal and ahistorical *ego* from the *Discourse on the method* (in *Vita* he famously claimed not to figure out, *non fingerassi*, his life story) and Thomas Burnet's cosmological *fantasia* which was, in Vico's opinion, picked up from Descartes' *Le monde* (notice the pleonastic use of words denoting the «resolution»: *risolve-risoluzione-risolutasi*, and of terms connected with imagination and fancy: *capricciosa-immaginata-fantasia*)<sup>10</sup>:

La quale dimostrazione veramente risolve la capricciosa *risoluzione della terra*, immaginata da *Tommaso Burnet*; della qual fantasia ebbe egli inanzi i motivi prima da *Van-Elmonte*, e poi dalla *Fisica* del *Cartesio*: che, risolutasi col diluvio la terra della parte del *sud*, piucchè da quelle del *nort*, fosse questa restata nelle sue viscere più ripiena d'aria, e in conseguenza più galleggiante, e perciò superiore all'altra opposta, tutta sommersa dall'Oceano; e quindi avesse la terra alquanto declinato dal suo parallelismo dal Sole<sup>11</sup>.

<sup>8</sup> *De rat.*, p. 114.

<sup>9</sup> On the role of fiction and related aesthetic terms in Descartes's epistemology and herein-after see: C. Labio, *Origins and the Enlightenment: Aesthetic Epistemology from Descartes to Kant*, New York, Cornell University Press, 2004, pp. 15-34.

<sup>10</sup> «In order, however, to make the length of this discourse less boring for you, I want to wrap part of it in the cloak of a fable, in the course of which I hope that the truth will not fail to appear sufficiently and that it will be no less agreeable to see than if I were to set it forth wholly naked» (R. Descartes, *The World, Or Treatise on Light*, tr. by M. S. Mahoney, <<http://www.princeton.edu/~hos/mike/texts/descartes/world/worldfr.htm>>).

<sup>11</sup> G. Vico, *Principi di una Scienza Nuova intorno alla natura delle nazioni per la quale si ritrovano i principi di altro sistema del diritto naturale delle genti*, introduzione e cura di F. Lomonaco, Napoli, Diogene, 2014, p. 53. In the same time, Paolo Rossi emphasized the similarity between Vichian and Burnetian models of the world's history as well as in their aesthetics, underlining also the discrepancies between them – for example, Burnet's adherence to the *prisca sapientia* model or

Vico perceived Descartes through a variety of lenses: as we learn from his *Autobiography* he first came across Cartesian physics and metaphysics when he took from his father’s book shelves *Fundamenta physices* by Henricus Regius whom he erroneously thought to be a «mask» of Descartes himself. But Vico was perfectly unaware of Descartes’ real attitude towards his unfortunate follower and knew nothing of the heated disputes that arouse between them at the end of 1640’s; so he erroneously took the Regius’ *Fundamenta* for an accurate account of Cartesian physics<sup>12</sup>. In *Vita* Cartesianism has famously been likened to Epicureanism – both philosophical currents recognized the unique genre of substance, the crucial difference being the attitude towards the role assigned to fate (the school of Epicurus denied it, while Descartes made it a pillar of his entire system). We can see that in fragments touching upon Regius and Burnet the complexity of various «faces» of Cartesianism has been smoothed – Vico mixed up, though unintentionally, the allegedly «Cartesian» transcription of Genesis by the English «theoreticians of the Earth» and Descartes’ proper «mental experiment» from *Le monde*; he also subsumed Regius’ dissident physics under the umbrella title of Descartes’ philosophy of *primum verum*. In Vico’s representation in *Vita*, Cartesian philosophy appears as defective and unable to give rise to the other sciences: ethics (Malebranche failed to build on it any system of the Christian ethics), logic (the alleged Cartesians Arnaud and Nicole in fact shaped their logical system according to the Aristotelian scheme), and medicine (because «the man of Descartes can’t be found in nature by the anatomists»)<sup>13</sup>. This sterility of the Cartesian method in its applications to particular disciplines is correlative to its detachment from the empirical world – and Burnet’s «theory of the earth» represented one of the attempts, doomed to failure, to apply the Cartesian conceptual framework to any real object.

The reason for this particular deficiency of Cartesian physics resides on the fundamental tension inherent to the underlying construction of evidence: the hiatus between the *quid sit* and *an sit* or the ontological indeterminacy marks Descartes’ thought as a whole. The shadow of skepticism – the idea that the Cartesian proof of the existence of the external world in the Sixth Meditation is nothing but an illegitimate inference, while his «physics is inadequately founded on empirical hypotheses»<sup>14</sup> – runs all throughout the history of the early reception of Descartes; Vico’s general complaint against Descartes, as in a number of other cases, echoed the wide-spread image of the philosopher among the citizens of the Republic of Letters, an image partly justified by the «authentic»

his accent on Christology totally absent from the Vico’s thought (P. Rossi, *The Dark Abyss of Time: The History of the Earth and the History of Nations from Hooke to Vico*, Chicago, The University of Chicago Press, 1987, p. 106).

<sup>12</sup> On the Descartes-Regius controversy, see C. F. Fowler, *Descartes on the Human Soul: Philosophy and the Demands of Christian Doctrine*, Dordrecht, Kluwer, 1999, pp. 340-410.

<sup>13</sup> *The Autobiography of Giambattista Vico*, cit., p. 22.

<sup>14</sup> M. T. Marcialis, *Sceptical Readings of Cartesian Evidence in Seventeenth- and Eighteenth Century Italy*, in *The Return of Scepticism: From Hobbes and Descartes to Bayle*, ed. by G. Paganini, Dordrecht, Kluwer, 2003, p. 243.

Cartesian texts: in *Meteora* and *Dyoptrics* Descartes effectively proceeded on hypotheses (suppositions); *inter alias*, which can be explained as an element of prudential scenery (to use Descartes' own words, an attempt to «sound the channel», *sonder le guay*, or to «come forward, wearing the mask», *larvatus prode*). Descartes pretended in his correspondence that necessary precautions were the only reason for not making explicit the whole chain of reasoning, connecting the premises with the conclusions: «I can deduce them from first truths which I have already explicated, but I explicitly desired not to give them»<sup>15</sup>.

Still, the hypothesis lies at the very heart of Descartes's scientific method in physics – a distinctive trait largely recognized by both his opponents and followers. Significantly, the centrality of hypothesis generates a shift in Descartes' conception of demonstration, moving it away from the Aristotelian rigorous deducting from the first principles<sup>16</sup>. This inner tension inside the Cartesian idea of demonstration (deduction *vs* proceeding from effects to hypothetical causes and *vice versa*) made his followers diverge on the issue of the explanatory power of eventually false hypotheses. Prior to examining the Burnet's solution, let us consider a representative sample of the passionate apology of the Cartesian «hypothetical» approach to physics in a treatise by Rasmus Bartholin (1625-1698), a Danish partisan of Cartesian philosophy. Bartholin in his *De naturae mirabilibus quaestiones academicae* recollects the most «embarrassing» arguments, targeting the ontological weakness of the Cartesian hypothetical proceeding in physics; he cuts to the very essence of the empiricist reproaches to Descartes, the result of which is very close to the Vichian criticism. As Bartholin neatly emphasizes, «the very nature of the hypothesis repudiates its demonstration by the experimental means»<sup>17</sup>; nevertheless, he is perfectly aware of the danger of the uncontrolled framing of hypotheses<sup>18</sup>. Paradoxically enough, the main guarantee of the validity of the Cartesian model of physics turns out to be its inner logical coherence and apodeictic singularity, putting the rival theories in embarrassing conditions because of the «difficulty of

<sup>15</sup> D. Garber, *Descartes' Metaphysical Physics*, Chicago, University of Chicago Press, 1992, p. 22.

<sup>16</sup> On this point see D.M. Clarke, *Descartes Philosophy of Science and the Scientific Revolution*, in *The Cambridge Companion to Descartes*, ed. by J. Cottingham, Cambridge - New York, Cambridge University Press, 1992, pp. 258-285.

<sup>17</sup> «Quod si ergo Astronomi, hypotheses excogitarunt serio, non fictionibus ludentes cassis, quos tamen non jubetis, ut demonstrent, ipsas esse naturae constitutiones, potius quam ingenii sui foetus; cur Physicos putatis ingeniorum lascivire luxuria, eos, qui hypotheses amplectentur, ad explicanda reliqua naturae phaenomena? [...] Naturae hypothesis repugnat, ut demonstretur eas, ex rei compertae fide esse excogitatas; desinuntque esse suppositiones, ubi exerimenta rem ipsam ostendunt» (E. Bartolinus, *De naturae mirabilibus quaestiones academicae*, Hafniae, Bibliopola literis Gødiani [...], 1674, pp. 74-75).

<sup>18</sup> «Si derelicto sensu, et sequendo rationes quasdam congruentes, liceat fingere mundum ad libitum, aut systema mundi, quale Aristarchus et Copernicus, et Renatus Descartes, nullum certum erit systema in Astronomia; nihil in Physica reale; sed licebit cuivis ingenioso, et Astronomica eruditione, Physicisve experimentis erudito, fingere plures diversas hypotheses» (*ibid.*, p. 75).

inventing another theory of equal perfection»<sup>19</sup>. Thus, the demonstrative power of Cartesian physics resides not in the necessary relationship between theory and its object, but rather in its rhetorical efficacy. So, the difficulty of *mimesis* turns into a plausible ground of the scientific validity of a theory, and aesthetic criteria merge with the epistemological ones. Even on the level of the terms used by Bartholin for describing the impact of the logical coherence on who perceive it, we can see the affinity with the rhetorical categories: the alleged capacity of the Cartesian apodeixis to «lead the souls» (*ferre animos*) cannot but remind us the Ciceronian *animum movere*, as well as the stylistic characteristics of deductive reasoning, praising its «simplicity and natural beauty» (*simplicitas, naturalis venustas*)<sup>20</sup>; no less significant is the moral habit of distinctive reasoning, generated by the exercise of the Cartesian method (*diuturnitas distincte ratiocinandi, et disserendi, methodum hanc convertit in mores*<sup>21</sup>), which endows the geometrical method with an ethical dimension proper to rhetoric. Quite characteristically, Bartholin puts forward the idea of a certain «invincible force» (*invicta quaedam vis*<sup>22</sup>), inherent to deductive argumentation, and declares the extension of this argumentative principle to all the possible areas of interaction (*in quotidianae vitae communi commercio*). This interference of mathematical demonstration and rhetoric constitutes one of the possible ways of surmounting the communicative deficiency of the Cartesian method; another one is represented by Vico’s *bête noire*, Thomas Burnet.

As we have already mentioned above, Burnet’s main cosmological work, *Telluris theoria sacra* (1681, engl. *Sacred Theory of the Earth*, 1684), despite its apologetic pathos (the author consciously presented it as a confutation of the notorious Isaac de La Peyrère’s hypothesis on the eternity of the world<sup>23</sup>), engendered a heated controversy throughout Europe and after a short period of enthusiasm attracted widespread criticism from his intellectual peers. Surprisingly, in the preface to the English edition of his «Theory...» Burnet made an unexpected step to counter the attack; as M. B. Prince justly observed, he

<sup>19</sup> «Aut standum esse hoc invento, aut aliud diversum aequalis perfectionis fingendum; quod quam sit difficile, adeoque mortalium arduum nimis, fatebitur ille, qui singula penitus consideraverit» (*ibid.*, p. 76).

<sup>20</sup> «Quis non laudabit, et suspiciet hanc ingenuitatem, et simplicitatem investigandae veritatis, quae nullo fuco, sed naturali venustate, nitorem addit vilioribus, et quicquid in mundi ambitu continetur, vel est in quotidianae vitae communi commercio, non tantum explicat, sed demonstrat?» (*ibid.*, p. 79).

<sup>21</sup> *Ibid.*, p. 80.

<sup>22</sup> «Hisce consequentiis necessariis indita est invicta quaedam vis, quae animos graviter ferit, quamquam ex abdito [...]. Hinc pauca loquuntur, multa docent, nunquam fortuito disserunt, aut vulgaria; sed ea tantum enunciant, quae consequentia patefecit, demonstratio conclusit; propria Philosophiae, et veritati: eritque tam in Physica, quam in Mathematicis et Geometria, unus idemque Philosophiae vultus» (*ibid.*, p. 77).

<sup>23</sup> K. V. Magruder, *Thomas Burnet, Biblical Idiom, and Seventeenth-Century Theories of the Earth*, in *Nature and Scripture in the Abrahamic Religions: Up to 1700*, 2 voll., ed. by J. van der Meer, S. Mandelbrote, Leiden, Brill, 2008, vol. I, p. 462.

«does not reject the criticism; rather, he embraces it!»<sup>24</sup>; he turns his enemies' weapon against themselves, arguing that each theory of nature may be considered as a romance from a certain point of view:

I mean Men of Wit and Parts, but of short Thoughts, and little Meditations, and that are apt to distrust every thing for a Fancy or Fiction that is not the dictate of Sense, or made out immediately to their Senses. Men of such Humour or Character call such Theories as these, Philosophick Romances, and think themselves witty in the expression. They allow them to be pretty amusements of the Mind, but without Truth or reality. Where there is variety of Parts in a due Contexture, with something of surprizing aptness in the harmony and correspondency of them, this they call a Romance; but such Romances must all Theories of Nature, and of Providence be, and must have every part of that Character with advantage, if they be well represented<sup>25</sup>.

The «witty» critics of Burnet's physicotheology fall into an error because they lack ingenuity, being unable to «enlarge their thoughts to take in any great compass of Times or Things». Then, Burnet describes his «romantic» imaginative method<sup>26</sup> along the same lines as Vico did, characterizing the proceeding of his topic: we «do not make or contrive ourselves [the natural scientific truths], but find and discover them»<sup>27</sup>. This inventive strategy, which lays the «itinerary through chaos to order», has at its core «a formula of a grand aesthetic» – the idea of a «masculine beauty» of any scientific theory:

And when they are clearly discovered, well digested, and well reasoned in every part, there is, methinks, more of beauty in such a Theory, at least a more masculine beauty, than in any Poem and Romance<sup>28</sup>.

The scholars debate the extent of the English Earth theoreticians' reliance on Descartes: J. Roger pretends that Descartes displays in his *Le monde* the generation of the Earth «in some atemporal sense» in contrast to Thomas Burnet's historical account<sup>29</sup>, while P. Harrison sees the difference between them as rather one of emphasis. He states that in Burnet we find «only partial historicization» of the Cartesian model; his geogonic model reminds us rather

<sup>24</sup> M. B. Prince, *A Preliminary Discourse on Philosophy and Literature*, in *The Cambridge History of English Literature, 1660-1780*, ed. by J. Richetti, Cambridge, Cambridge University Press, 2005, p. 400.

<sup>25</sup> Th. Burnet, *The Sacred Theory of the Earth*, London, printed for M. Wotton, 1697, *Preface*.

<sup>26</sup> A. Coppola, *Imagination and Pleasure in the Cosmography of Thomas Burnet's Sacred Theory of the Earth*, in *World-building and the early modern imagination*, ed. by A. B. Kavey, New-York, Palgrave Macmillan, 2010, p. 120.

<sup>27</sup> Cf. another related statement: «Short-sighted minds are unfit to make Philosophers, whose proper business it is to discover and describe in comprehensive Theories the *Phaenomena* of the World, and the Causes of them».

<sup>28</sup> J. Roger, *The Cartesian Model and Its Role in the Eighteenth-Century "Theory of the Earth"*, in *Problems of Cartesianism*, ed. by T. M. Lennon, J. W. Davis, Kingston and Montreal, McGill Queen's University Press, 1982, pp. 95-112.

<sup>29</sup> P. Harrison, *The Influence of Cartesian Cosmology in England*, in *Descartes' Natural Philosophy*, ed. by S. Gaukroger, J. Schuster, J. Sutton, New-York, Routledge, 2000, p. 178.



of the Hobbesian mental experiment of the state of nature<sup>30</sup>. According to some researchers, Burnet inherited from Descartes both his «temporal sensibility and epistemic posture»<sup>31</sup> – despite his pronounced wish to keep the distance from the Mosaic account of the world creation, Descartes sought to endow the physics with a diachronic dimension, searching to display the «imaginative structure of rational order»<sup>32</sup>. Furthering Descartes’ line of cosmogonic thinking, Burnet pretends that his construction was not simply an idea of what possibly could have happened in the moment of Creation, but «an account of what really came to pass in the Earth» (ch. 7 of the «Sacred Theory»). The possibility of application of Burnet’s hypothetical cosmology to the real history of the Earth relies on the postulated congruence between the intellectual structures of the human mind and those of the universe, created by God, (i.e., the congruence between the «Intellectual World» and the natural one<sup>33</sup>). In perfect accordance with the Vichian claim that the «facility dissolves the *ingenia*, while the difficulty sharpens them» (*facilitas dissolvat, difficultas vero acuat ingenia*), Burnet dedicated a long passage to the pleasure which arises from the exercise of our ingenious faculty of reason<sup>34</sup>. At the same time, the crucial argument in defense of the scientific validity («fairness») of his «protogeological» theory resides, in full accordance with Batholin’s template, in its «consistency and possibility» and the «incongruity and impossibility» of the rival ones<sup>35</sup>. Moreover, the whole construction of evidence in Burnet is crowned by a fantasy in the line of Bernard le Bouyer de Fontenelle: he imagines a certain «visitant», a philosopher, coming from another planet «out of curiosity to see our Earth» and giving a bird’s eye view «from the top of Pick *Teneriffe*» on our «little dirty Planet».

Thus it seems quite understandable why both the admirers and the critics of Burnet’s theory of Earth carried out the aesthetic arguments of different sorts; thus, Joseph Addison dedicated an ode to Burnet, praising the *Telluris historia* for its literary values<sup>36</sup>, while Melchior Leidekker, an uncompromising critic from the position of Reformed orthodoxy, blamed it for the frailty of the antediluvian and the gloomy picture of the postdiluvian world: «Bone Deus, si

<sup>30</sup> On the mental «*annihilatio mundi*» as the best starting point for any natural philosophy in Th. Hobbes see Y. Ch. Zarka, *La décision métaphysique de Hobbes: conditions de la politique*, Paris, Vrin, 1999, pp. 36-58.

<sup>31</sup> K. V. Magruder, *Thomas Burnet*, cit., p. 456.

<sup>32</sup> M. B. Prince, *A Preliminary Discourse*, cit., p. 399.

<sup>33</sup> «And we must first consider how God hath ordered Nature, and then how the Oeconomy of the Intellectual World is adapted to it; for of these two parts consist the full System of Providence» (Th. Burnet, *The Sacred Theory of the Earth*, cit., pp. 3-4).

<sup>34</sup> *Ibid.*, p. 4.

<sup>35</sup> «A fair Idea of a possible Deluge in general [...] a possible and consistent Explication of an Universal Deluge [...] all other ways hitherto assigned for the Explication of the Noah’s Flood are incongruous or impossible; therefore it came to pass in that possible and competent way which we have proposed» (*ibid.*, p. 54).

<sup>36</sup> *Mr. Addison’s Ode to Dr. Thomas Burnet on his Sacred Theory of the Earth*, London, printed for T. Warner, 1727.

quid sentio veri, fractus orbis et collapsus est, et nos habitamus illius ruinas!»<sup>37</sup>. Melchior Leydekker (1642-1722) had a particular concern to attack Burnet – being a passionate partisan of *Näbere Reformation* and heated polemicist against Cartesianism in the footsteps of his teacher Gijsbert Vossius, he could not find a better target for his invective. Besides the merely theological arguments, taking Burnet's and Descartes' heliocentrism<sup>38</sup> as its aim, we can see in Leydekker's treatise a clash of rival aesthetic programs: for the «classicist» taste of the Dutch, Burnet's antediluvian Earth, being «from the very beginning predisposed to the ruin» (*ad ruinam mox ab ortu preparanda*), completely lacked any beauty (*nam Burneti primigenia Tellus nullum habet κάλλος vel pulcritudinem, minime κόσμος est*). Another Cartesian trope that Leydekker detected and dismissed is that of the overlapping of allegorical exegesis and hypothetical proceeding (*metaphoricam ῥήσιν flectere ad novam Hypothesin*); the erudite metaphor gives rise to a sort of juggling by unfounded hypotheses, because the underlying cognitive mechanism is the same.

If Leydekker's criticism was by and large confined to aesthetic and theological arguments, the majority of Burnet's opponents contested his scientific method on epistemological grounds, attacking chiefly the Cartesian attachment to hypotheses as a research tool. Thus, in contrast to a furious but serious criticism by Whiston, Keil, and Woodward, Robert St. Clair, Robert Boyle's assistant and partisan of the experimental method<sup>39</sup>, had no scruple to treat his opponent in a strikingly disdainful manner, saying, for instance, that «a good Woman that makes Butter'd Cakes to sell them again, does more service to the Publick, than the Doctor has done by his Theory». St. Clair's own diluvial theory represents the genesis of the Flood as a chemical process, «a conflict of contrary Salts, Acid and Alkali» in the bowels of the Earth. To prove his hypothesis, he resorts to an experiment, carried out together with his friend, an Ambassador of Venice: the eruption of the subterranean waters of the «Tehom-Rabba» (Great Abyss) was reproduced *in vitro* by the means of a siphon and acid, vitriol and metallic chips<sup>40</sup>. In a sarcastic passage, which

<sup>37</sup> M. Leydekker, *De Republica Hebraeorum libri duodecim, quibus de sacerrima gentis origine et statu in Aegypto, de miraculis divinae providentiae in Reipublicae constitutione, de Theocratia, de illius sede ac civibus, de regimine politico, de religione publica ac privata, disseritur. Porro antiquitates Judaeorum verae ostenduntur, et falsae corriguntur, historia Veteris Testamenti exponitur, fabulosae origine Gentium, Aegyptiorum, Phoenicum, Arabum, Chaldaeorum, Graecorum et Romanorum referuntur. Subjicitur Archaeologia Sacra, qua historia creationis et diluvii Mosacia contra Burneti profanum telluris Theoriam asseritur*, Amstelaedami, apud I. Stokmans, 1704, p. 88.

<sup>38</sup> «At omnem audaciam superavit Burnetus, dum fassus est systema Cartesii Scripturis repugnare, nec minus suum de Sole in medio Universi constituendo» (*ibid.*, p. 87).

<sup>39</sup> M. Hunter, *Boyle Studies: Aspects of the Life and Thought of Robert Boyle (1627-91)*, Dorchester, Ashgate, 2015, p. 14.

<sup>40</sup> «One might represent the whole of this to the Eye thus, let there be a round Ball to represent the Earth, (with a hole at the end, standing for the North Pole, at *a*, which Kircher supposes the Ocean to circulate thro' the Earth) of glass *fff*, full of risings to represent the Mountains *b b b*, let the Ball be fill'd with Water, and at the hole insert a Pipe *g g g*, which cement to the Neck, throw in by this Pipe some filings of Steel, after which some Oil of Vitriol, and keep the Ball inclining, so that the steams arising may not get out at the hole, but being pented in

emphasizes the arbitrariness of the elementary principles, set forth by Burnet, (that is, oil, salt, and earth), St. Clair insists on the fact that even his experimentally validated hypothesis may never be considered as a historical reconstruction of what really happened to the Earth in the course of the Universal Flood (the reader may excuse us for quoting the St. Clair’s argument at length):

Now may *Paracelsus* keep to himself his three Principles Salt, Sulphur and Mercury, *Aristotle* his four Elements, *Des Cartes* his three Principles of *Materia subtilis, globuli secundi elementi, & materia tertii elementi*, and the most experienc’d *Van Helmont*, his Axiom *Of Water and Seminal Principles all things are made; tho’ experience taught him, and others since him, that not only Oil, but also Salt, Earth, &c. are made of Water, which is known à posteriori, or by the effect, or experiment (the Foundation of all the Knowledge we have of Nature.)* But as for the Antediluvian World, since it doth not so much concern us now, I shall leave the consideration of its Principles to the Abyssinian Philosophers, who demonstrate all things *à priori*<sup>41</sup>.

Be it the cumbersome and somewhat scholastic refutation of his theory by Melchior Leidekker or the witty criticism of Robert St. Clair, the critics concentrated on the fictional nature of Burnet’s account. Dismissing the very possibility of framing hypotheses for reconstructing the history of the world, his critics did not see the elements of inventive methodology, somehow close to the Vichian «topical physics», in Burnet’s theory of the Earth.

Vico famously decries the extension of the methods and epistemological standards of the contemporary natural science to the era of the «first physicians» who were also the «first poets» with «robust imagination» and «little reason»; but surprisingly we find a kind of continuity between the «poetical physics» and the *recentior physica*; thus, Descartes has happily demonstrated the «visual ray» (*baston visuale*) of the Stoics, who had inherited this metaphor from the «heroic descriptions» of primitive men; moreover, it turns out that «our most intelligent physicists» are «just beginning to understand» the truth discovered by the «heroic poets», according to which «to touch a body is to take something away from it»<sup>42</sup>. Moreover, Vico ranked among the *commoda*, i.e., among the advantages of the contemporary method in natural sciences, the

may drive out the Water at the Pipe, which if the Ball were the Center of the Earth, would overflow all the surface of the Glass, and cover the Mountains of it, but this being wanted, we may imagine another glass *c c c* divided in two as you see, so that they may be cemented together when the other glass ball is inclos’d, all the Water that runs out at the mouth of *g g g*, will overflow the Hills *b b b*, &c.» (R. St. Clair, *The Abyssinian philosophy confuted, or, Telluris theoria neither sacred not agreeable to reason being for the most part a translation of Petrus Ramazzini, Of the wonderful springs of Modena: illustrated with many curious remarks and experiments by the author and translator: to which is added a new hypothesis deduced from Scripture and the observation of nature: with an addition of some miscellany experiments*, London, printed for the author and sold by W. Newton, 1697, Preface).

<sup>41</sup> *Ibid.*

<sup>42</sup> *The New Science of Giambattista Vico. Unabridged Translation of the Third Edition (1744) with the Addition of “Practic of the New Science”*, translated by Th. G. Bergin and M. H. Fisch, Ithaca - New York, Cornell University Press, 1976, p. 238.

progress of *ingenium* in physics (*a nostris longe ingenio victos*<sup>43</sup>) – let us remember in this respect the alleged utility of modern physics for poetry (at the end of the chapter VIII of *De ratione*), consisting in the fact that the former contains a copious reservoir of metaphors and sensible images (including even the more archaic trope of metonymy) which may be used by the latter<sup>44</sup>.

In the final analysis, we may wonder, whether the distinction between the «modern» (Cartesian) physics based on «sorites» and the ancient or would-be physics of *ingenium* was effectively so sharp as it sometimes appears, and correspondingly, whether the «Cartesian» characters Vico targeted deserved his reproaches. The image of Descartes' physics in Vico, as examined throughout his writings, is full of contradictions and indeterminacy. In our opinion, the straightforward dualism of the analogical-inductive knowledge and critical-deductive one (*conoscere analogico-induttivo* vs. *conoscere critico-deduttivo*), usually regarded as a distinctive trait of the Vico's thought, should be substituted by something more subtle. Our analysis reveals the convertibility of some conceptual oppositions in Vico's thought: critical thinking doesn't merely contradict the topical-inventive thinking; rather, it contains the seeds of the previous stages of the «natural progress of the metaphors». The metaphor, the main cognitive tool of his physics, is also ambivalent: in *De ratione* it appears simultaneously as an element of *ornatus* and an epistemic principle of natural science. In spite of the insurmountable cleft between the sensitive thinking of the primitive men and the rationality of the scholars in the era of *ragione spiegata*, the imaginative metaphysics and sensitive metaphor – the «most luminous and therefore the most necessary and frequent» trope of the poetic logic – are still demanded by the contemporary science, as it is stated that «in every language the terms needed for the refined arts and recondite sciences are of rustic origin». Another sample of the active role that imaginative metaphysics plays in the epoch of the «explained reason» is the famous mental dictionary, «the language spoken by the ideal eternal history», exposed in details in the first *New Science*, but then omitted in the final cut of Vico's *opus magnum* – as well as that contemporary rational physics speaks by tropes of the poetic logic, the «rational civil science of Providence» uses «mental dictionary» springing from the *common sense* of nations. This oscillation between the continuity and rupture marks the whole of Vico's conceptual framework, making the position of the author, his *ironic* attitude, significantly problematic and somehow analogous to the status of the etymological reasoning in Plato's *Cratylus*. The *New Science* does not presuppose any external «observer» or «actor», or Pierre Nicole's *point fixe* – it is not by chance that the fragment containing the «practice of this science» had been omitted by the author in the final cut of his *opus magnum*. In contrast to the Cartesian dreamer Vico, himself involved in the «natural progress of metaphor», *rovesciandosi nella feccia di Romolo*, does not construct hypotheses – on pair with his famous addressee, who has never replied to sender.

<sup>43</sup> *De rat.*, p. 122.

<sup>44</sup> *Ibid.*, pp. 148-149.



**Julia V. Ivanova**

National Research University - Higher School of Economics, Moscow  
jivanova@hse.ru

**Pavel V. Sokolov**

National Research University - Higher School of Economics, Moscow  
psokolov@hse.ru

– *Physica ingeniosa* and Abyssinian philosophy: the Ambivalence of the Cartesian Physics in *De ratione*, V

Citation standard:

IVANOVA, Julia V. - SOKOLOV, Pavel V. *Physica ingeniosa* and Abyssinian philosophy: the Ambivalence of the Cartesian Physics in *De ratione*, V. Laboratorio dell'ISPF. 2016, vol. XIII (8). DOI: 10.12862/Lab16VNJ.

Online: 21.12.2016

#### ABSTRACT

This study contrasts Vico's conception of the physics based on *ingenium*, developed in chapter five of *De ratione*, to its alleged counterpart, Cartesian deductive natural science. By examining the various «faces» and ramifications of Cartesian physics with a special focus on Thomas Burnet's «ingenious physics», the Authors demonstrate the affinity of some versions of the Cartesian hypothetical approach to Vico's rhetorical epistemology.

#### KEYWORDS

G. Vico; R. Descartes; Th. Burnet; Natural science; *De ratione*

#### SOMMARIO

*“Physica ingeniosa” e filosofia abissina: l’ambivalenza della fisica cartesiana in “De ratione”, V.* Lo studio pone a confronto la concezione vichiana della fisica, basata sull’*ingenium*, sviluppata nel quinto capitolo del *De ratione*, con la sua presunta controparte, la scienza naturale deduttiva di Cartesio. Esaminando le diverse “facce” e ramificazioni della fisica cartesiana, con un’attenzione particolare alla “fisica ingegnosa” di Thomas Burnet, gli Autori dimostrano l’affinità fra alcune versioni dell’approccio ipotetico cartesiano e l’epistemologia retorica di Vico.

#### PAROLE CHIAVE

G. Vico; R. Descartes; Th. Burnet; Scienza della natura; *De ratione*

