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ARTICLE

'*Utrum physiologia sit prima philosophia*': Metaphysics and science in Tommaso Campanella

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Abstract
This essay considers the philosophy of Tommaso Campanella by examining it in light of a metaphysics conceived from the relationship between history, science, and experience. The desire to reform scientific knowledge beyond Aristotelian boundaries, integrating history and experience as the foundations of science, leaves Campanella's philosophy still steeped in the logical distinctions between natural science and metaphysics. After all, Campanella positioned the entire philosophy of nature as an intermediate knowledge capable of uniting logic and metaphysics. Nevertheless, his metaphysics breathes the cultural atmosphere of early modernity, which, while referencing the past, looks towards a future still uncertain, balancing between ancient concepts and new meanings that will eventually be attributed to the vocabulary of modern metaphysical language.

Keywords: Campanella; Metaphysics; Philosophy of Nature; Book of Nature

In his Preface to the *Quaestiones physiologicae*[1], Tommaso Campanella recalls how the making of philosophy relies on the coexistence of two codes, or Books: the Nature of things and the sacred Scripture – '*Rerum natura est codex primus theologiae*'. Campanella argues for freedom of philosophizing, including in the theological sphere, while he strives to release the Book of nature from Aristotelian and scholastic interpretations: these two stances will spark off his reform of thought and scientific disciplines on the ground of a deep, ultimate link between the two Books – Nature and the Scriptures. Both compete for divinity: Scripture, as a revealed book, explains the order of reality

[1]The *Quaestiones physiologicae* were drafted between 1609 and 1613 and constantly reworked until they were published in Paris in 1637. The book was conceived 'against ancient and modern sectarians, and in defence of the philosophy of the Saints' (Campanella 2007: 48). By 'philosophy of the Saints' Campanella refers to a doctrine that is as alien and distant as possible from Aristotelian dictates.

as having its origin in the nature of things; nature, as the first 'universal book written in living letters' (Campanella 1951: 22), is the means through which God revealed Himself.

Reference to the two Books is everywhere in Campanella's works. In particular, he constantly uses nature, the Book of the world, against the bookish knowledge distinctive of the Aristotelian tradition as well as of the humanistic-Renaissance tradition[2]. Campanella's way of philosophizing consists in carefully reading the living Book of nature rather than the philosophers' 'dead books'[3]:

Yet Campanella goes even further as in his view nature is not only a guide to 'philosophizing well', but also to 'theologizing well'. He boldly writes:

> the first Book from which we draw theology was nature. But since this had become too meager for us, left as we were in ignorance and foolishness due to our sin, a more suitable book was needed, albeit not a better one. For better is universal nature written in living letters than the Holy Bible written in dead letters, which are only signs and not actual things as in the first Book[4]. (Campanella 1951: 22)

The Book of Scripture would, therefore, play a secondary role, representing nothing more than a set of signs through which God reveals to humans the truth of things in simple and uncomplicated words, just as 'a father talks to his child' (ibid.). There is hardly any need to emphasize how radically heterodox and dangerous this kind of position was in the cultural climate of the time.

As to philosophy of nature, Campanella was known for his attempt to reform scientific knowledge through a critique of the method and foundation of science. The

[2]See the letter to Antonio Querengo in which, distancing himself from Pico, Campanella underlines the diversity of his own philosophy: 'Here is how my way of doing philosophy differs from Pico's; and I learn more from the anatomy of an ant or a leaf of grass (let alone the world's magnificent one) than from all the books written from the beginning of time' (Campanella 1927: 134). See Garin (1961: 451-465).

[3]According to his sonnet, 'The Book of Nature' (1998: 44):

> The world's the book where the eternal Sense
> Wrote his own thoughts; the living temple where,
> Painting his very self, with figures fair
> He filled the whole immense circumference.
> Here then should each man read, and gazing find
> Both how to live and govern, and beware
> Of godlessness; and, seeing God all-where,
> Be bold to grasp the universal mind.
> But we tied down to books and temples dead,
> Copied with countless errors from the life, –
> These nobler than that school sublime we call.
> O may our senseless souls at length be led
> To truth by pain, grief, anguish, trouble, strife!
> Turn we to read the one original!

[4]'*Primus codex, unde scientiam sacram sumimus, erat rerum natura. Sed cum ista nobis ignorantiae et socordiae propter peccata traditis non sufficeret, indiguimus altero codice nobis conventiori, non autem meliori. Melior enim est rerum omnium natura literis vivis exarata, quam Biblia Sacra literis mortuis, quae solum signa sunt et non res, uti in priori codice, contexta*'.

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expanded geographical boundaries brought about by Columbus', along with Brahe's and Galilei's astronomical observations, exerted a deep influence on him. Campanella was lead to review the fundamental issue of the foundations of science and its relationship with theology and metaphysics.

Arguably, Campanella conceives science as a systematic acquisition of objective reality: a secured and evident knowledge that is open to further development. A definition of science can be found in the *Dialectica: Scientia est certa et evidens notitia rei, ex necessariis notisque deducta* (Campanella 1638a: 397). For there to be science, a *notitia rei*, a knowledge of things, is needed. This *notitia rei* is deduced from compelling observations that establish the objectivity of what is experienced. These observations are subsumed by universal laws that express a relationship of cause and effect, thereby becoming the foundation of science itself[5]. Campanella, therefore, conceives scientific knowledge as *scire per causas: scire arbitrantur omnes homines cum rerum causas cognoscunt propter quas illae res sunt et quod aliter se habere non contingit* (ibid.)[6]. By virtue of this process, science can never reach an irrefutable certainty and shall remain open to possible enhancement: *perfecta scientia non datur ulla* (Campanella 1638a: 398). While this statement does not jeopardize the veracity of science, it sets a clear limit to scientific knowledge.

The limit concerns the series of empirical data as they are actually perceived. It does not affect scientific certainty, though, as science would still guarantee for the validity of the perceived data. Yet scientific inquiry has its own objects in data, lived experiences that are neither universal nor absolute. This explains why scientific knowledge can never be thought of as absolute. The phenomena of science also determine the objectives and the limits of scientific inquiry.

If experience as it actually takes place is the source of *scientia*, then the bedrock of scientific knowledge must be historicity. Campanella writes in a key page of his metaphysical work:

> Therefore, for us, the principles of science are history. I call history that which we have not heard from others, but which has affected our eyes and senses; indeed, from what we have been affected by in history, we proceed to investigate what is still hidden. Had history been put into being by divine intervention, though, it creates faith and it is the source of theological faith if it involves the narration of divine events; whatever we elicit from those divinely revealed principles is not called faith, but theological science, since, like the other sciences, they also proceed to their conclusions from revealed histories. But if these principles can also be obtained by human reasoning, they coincide with science as God is one. […] On the other hand, if history is known in a human way, when it is attested by

[5]Hence the cleavage between science and opinion, as the latter is '*incerta et inevidens notitia, ex contingentibus raro fluctuante ratione deducta*' (ibid.).

[6]Campanella draws a distinction between *scire* and *sapere*. *Scire* refers to a particular science and prompts empirical knowledge, while *sapere* signifies metaphysical knowledge. However, he sometimes disregards this distinction and gives a variable meaning to either term: each of them could then signify either factual knowledge (when referring to an empirical concept), or actual knowledge when they signify the idea that corresponds to that concept.

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> many people worthy of faith and can be experienced by us, such as that a New World has been discovered, then it generates science[7]. (Campanella 1638b: 356)

The term '*historia*' still reveals the partial character of scientific knowledge if we consider its original Greek meaning, which refers not only to the inquiry but to its result that can be recounted, precisely, as history[8]. The *historia humanitus nota* is always in development: it consists both of the result of actual experiences and of the starting point for subsequent investigations.

The relentless progress of the sciences in the late 16th and early 17th centuries persuaded Campanella of the accuracy of this epistemology of science, which transformed the traditionally Aristotelian concept of science. He was persuaded that science needed a far-reaching reform that, by emphasizing the provisional nature of knowledge, would contrast the idea of an absolute and universal science which would be almost impermeable to changes. In his *Apologia pro Galilaeo*, Campanella warns those who adhere to Aristotelian astronomy for lack of a solid ground:

> Therefore, they rave in a foolish manner who think that what Aristotle has made known to us about celestial phenomena is sufficient; who said nothing of his own, as he himself claims, and invites others to investigate further; and those who came afterwards, uncertain, argue among themselves even today[9]. (Campanella 1997: 82-83)

The new astronomical discoveries – the new 'Clementine skies' revealed by Galileo's observations[10] – made it hard for scientific inquiry to be considered exhausted without sharing an anti-scientific prejudice. Hence the need to elaborate a new theoretical framework for natural philosophy that would provide an account of scientific knowledge more in keeping with reality[11].

[7]'*Itaque principia scientiarum sunt nobis historiae. Historiam dico etiam, quod non ab alio audivimus, sed nostris patuit oculis et sensibus: ex eo enim, quod patet historice, ad investigandum quod latet, proficiscimur. Si autem historia divinitus promulgata est, facit fidem estque principium fidei theologicae, si tamen de divinis est narratio: quidquid vero nos elicimus ex principiis illis, divinitus revelatis, vocatur non fides sed scientia theologica, quoniam sicut aliae scientiae ex revelatis historiis etiam procedunt ad conclusiones suas. At si et illa principia possunt humanis rationibus haberi communicant cum scientia, ut quod Deus sit unus. […] Si vero historia est humanitus nota, si a multis fide dignis contestatur et a nobis potest experiri, ut quod mundus novus repertus sit, facit scientiam*'.

[8]See Lamacchia (1986: 107).

[9]'*Quae insaniunt indoctissime, qui putant de coelestibus satis esse, quare patefacta sunt ab Aristotle; qui nihil de suo dixit, ut ipsemet fatetur, et alios investigare plura iubet: et posteriores incerti adhuc digladiantur*'.

[10]See Campanella's letter of January 1611 to Galilei (Campanella 1927: 166-167, https://it.wikisource.org/wiki/Lettere_(Campanella)/XXXI._A_Galileo).

[11]As Campanella writes in *De gentilismo*: '… in the Christian era Christians invented the press; Columbus, despite being contradicted by theologians and philosophers, discovered a new World, unknown to the ancients or denied by them; the Equatorial region, considered uninhabitable by Aristotle, Virgil, and many others, appeared inhabited; new celestial bodies were discovered by Galileo, while Copernicus and Peuerbach revealed the anomalies of the cardinal points, the apogees, and the zodiac – and, finally, the Portuguese circumnavigated the earthly globe. Hence the need to reform astronomy to match celestial phenomena, as Copernicus and Tycho undertook to do, while the Supreme Pontiff amended the calendar and the way the year is calculated. The invention of bombards, the use of the compass and windmills, and other admirable arts also made such a restoration necessary. Therefore there is also a need to renew the philosophy of nature, as Pico, Telesio, Vesalius, and Paracelsus began to do; and although these

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Having identified the ways through which it was possible to inquire into natural phenomena, Campanella had to consider yet what the philosophy of nature itself consisted of – in other terms, what was its essence. The opening *Quaestio* of the *Questioni di filosofia della natura* presents the following request for clarification:

> Whether natural philosophy is the first philosophy and principal science, as the Democriteans say; or whether it is the science not of primary things, but of universals, as Aristotle wants, or even of particulars; or whether it is only opinion as the Platonists teach[12]. (Campanella 1637: 3)

Thus Campanella begins by a review of the foremost definitions of 'physiology', or natural philosophy. Democritus first, for whom physiology is 'first philosophy' provided it deals with sensible and bodily things, which are evident and original[13]; then Plato, for whom there is no science concerning sensible experiences, but only opinions[14]; finally, according to Campanella, Aristotle muddles natural philosophy and *philosophia prima* as his physics deals with natural objects as universal abstractions, and not as individual instances.

Campanella wants to break with this tradition by following Aquinas and Albertus Magnus (who admit the possibility of both science and opinion regarding physical things[15]). He first defines wisdom and science: 'Wisdom is sensing things as they are. Science is to go back, from that particular sense, to recognize other propositions as they are, through their own causes, effects, and uncontested signs'(ibid.)[16].

While wisdom is to know the object immediately as it is[17], science cannot do without a discursive procedure that makes use of the concepts of cause and effect, along with a third element, the sign, on which rely demonstrative processes[18]. Scientific discourses include more demonstrations of sensible objects than of abstract, intelligible ones. The brightness of the sun is a more certain knowledge than the incorporeality of angels. Campanella concludes that we can have knowledge, opinion, suspicion, or faith of natural reality, depending on the degree of certainty we reach; this degree of certainty does not depend on the object, but on our capacity for knowledge.

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philosophers made mistakes, nevertheless, they show that the whole of philosophy is to be renewed, since discoveries and mistakes require a new, amended philosophy and a more accurate cosmography' (Campanella 1953: 5-6).

[12]'*Utrum physiologia sit prima philosophia et scientia scientiarum, ut dicunt Democratici; an scientia, ut Aristoteli placet, non primaria sed de universalibus, an etiam de particularibus; et an sit tantummodo opinio, ut platonici docent*'.

[13]By rejecting incorporeal entities such as divinities or abstract intelligences, Democritus can only admit sciences that are fastened to bodies.

[14]See Plato, *Timaeus*, 59cd; *Theaetetus*, 187ac. See Campanella (1637: 3): '*Scientia autem certa est, ergo de stabilibus, et quae aliter se habere non possunt: erit ergo opinio de sensibilibus non scientia*'.

[15]'*Sed contra est D. Thoma et M. Albertus in I Phys. asserentes de rebus physicis esse scientiam et quandoque opinionem*' (Campanella 1637: 4).

[16]'*Sapientia est sapor rei prout est. Scientia vero est, ex sapore illo rursus agnoscere alias propositiones rerum prout sunt, ex causis suis, effectibus et signis certis*'.

[17]Campanella explains in the *Metaphysics*, Book I, that such wisdom occurs when 'the sensible thing is attained with a sentient soul' (*Metaphysica* 1638a: 273).

[18]See *Dialectica*: '*Demonstratio a signo est quae probat aliquid non a causa nec ab effectu, sed ab eo, quod significatur solum*' (Campanella 1638a: 422-423).

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The possibility of a science of natural objects does not imply a primacy over other sciences. On the contrary, precisely because of its objects, 'natural philosophy is not first philosophy, because mental objects are and exist as nobler entities than natural objects, which are mere shadows of mental ones' (Campanella 1637: 4)[19].

This distinction of natural and mental objects could be easily misunderstood had Campanella not closely examined mathematical entities, which happen to be even less 'noble' than natural entities, insofar as they generally require to be explained by a demonstration through signs. On the contrary, he argues, 'natural philosophy does not proceed only from signs, but from causes of all kinds as well as from effects, and therefore seems better than mathematics and less noble than metaphysics' (Campanella 1637: 5)[20]. So, what is Campanella referring to when he speaks of mental objects? An interesting answer can be found in the fifth book of the *Metaphysics*, on the Ideation and Distinction of Sciences (Campanella 1638b: 343). In article IV of the first chapter, Campanella mentions the 'entity of reason'. He recalls that 'moderns argue incessantly about the real entity, which is found in nature prior to the act of reason, and about the rational entity, which comes into being thanks to the action of the intellect (Campanella 1638b: 344)[21], without further elaborating on this rational entity, which forms the ground of all sciences and arts. For Campanella, 'reason is a real entity, not a rational one. Basic acts of reason, such as knowing, understanding, reasoning, are real rational acts, as real as a real thing' (ibid.)[22]. The entity of reason, then, produced by the imagining soul, can take on three different types:

> The first has a real foundation and a real term: as when, from having seen the island of Sicily, I imagine what the British island, which I have not seen, might be. This imagination is a pure discourse. The second [occurs] when from real images of objects non-real images are produced or combined […] The third [occurs] when we add use, producing images that are useful to mean or to work' (ibid)[23].

At least two considerations can be drawn from this statement – both relevant for reimagining the space that Campanella envisions for natural philosophy. Firstly, the preeminence of mental entities over natural ones does not refer to mathematical or logical entities, but to metaphysical ones. The latter is indeed, by its own nature, superior to any other entity. As he explains in the *Compendium physiologiae*, 'the universal science, i.e. metaphysics, deals with entities as such, while particular sciences consider particular entities'. This distinction widens the gap between natural philosophy

[19] '*Praeterea physiologiam non esse primam philosophiam, quoniam obiecta mentalia sunt extantque nobiliora entia, quorum naturalia sunt umbrae*'.

[20] '*Et quoniam physiologia non modo a signis procedit, sed a causis omnis generis et ab effectibus, idcirco melior videtur quam mathematica et minus nobilis quam metaphysica*'.

[21] '*At quoniam Neoterici incessanter disputant de Ente Reali, quod ante Rationis actum in rerum natura reperitur et de Ente Rationis quod ex opere intellectus habet esse'.*

[22] '*Ratio non est Ens Rationis, sed rei. Operationes Rationis primae ut nosse, intelligere, ratiocinari, sunt reales actus rationis, ut res est'.*

[23] '*Aliud habet fundamentum reale, et terminum realem: ut cum ex visa insula Siciliae imaginor qualis esse potest insula Britanniae non visa mihi; et haec imaginatio discursus est purus. Secundo quando ex imaginibus realibus obiectorum non reales fingit imagines aut componendo […] Tertio cum addinius usum, faciendo imagines proficuas ad significandum aut operandum'.*

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and metaphysics, as well as between metaphysics and particular sciences. 'Theology – we read – deals with the supreme entity, moral science with morally good entities, mathematics with quantities, and logic with reasonings. Hence, natural philosophy deals with natural entities' (Campanella 1999: 36-37)[24].

From this point of view, there is hardly any difference between theology and physics, as both refer to particular aspects of being and unlike metaphysics whose object is being as such. This brings us to our second remark: if metaphysical entities are pre-eminent among the various kinds of entities, knowledge appears as a ladder in which philosophy of nature sits halfway between metaphysics and logical-mathematical knowledge. Campanella considers the latter as merely instrumental.

Once the scope of philosophy of nature is clear, it is time to consider what its subject is. In contrast to Ibn Sina, for whom natural philosophy deals with *res sensibilis*, Campanella states that 'the subject of natural philosophy are natural things' (Campanella 1637: 6)[25]. They are called *res naturales* because they involve the actual conditions of real entities, such as birth, death, changes, and corruption[26]. On the contrary, an entity is said to be *sensibilis* to emphasize an extrinsic determination or accidental difference. According to Campanella, this description would point at a marginal area of inquiry as the scope of natural philosophy goes way beyond the sphere of sensation. As he states in the conclusion of the first *Quaestio*, philosophy of nature deals with 'the principles, causes, parts, passions, and mutations of all natural things, and everything is considered within the scope of natural reason' (Campanella 1637: 6)[27]. Under this description, the domain of philosophy of nature is nonetheless so broad that it can virtually be considered as universal knowledge. What about the disciplines that fall under such all-embracing knowledge?

From the *Metaphysics* we know that the partition of history into *historia divinitus promulgata* and *historia humanitus nota* prompts two types of science: theology and micrology; micrology (the science of little things) is further divided into natural science and moral science. Beyond the subordinate value of micrology in relation to theology and the intermediary position of metaphysics, what matters here is to identify which disciplines belong to the vast sphere of natural science. Campanella writes:

> The science of nature indeed, starting from the history of the elements, the stars, the waters, the stones, the metals, and the plants, infers universal propositions that express the essences of corporeal things, and on the basis of these it considers the generations and corruptions, the changes, the parts, the principles, the effects, and the uses, with regard to humans and to the whole nature of bodies. Therefore, it considers their time, place, quantity, and number. Not being able, however, to scrutinize all bodies, humans have divided this science, so that there is one that considers the modifications of the human body, and in this provides

[24] '*Nam scientia communis tractat de ente simpliciter, ut metaphysica; particularis vero de aliquo ente, ut theologia de ente summo, moralis de ente bono moraliter, mathematica de ente quanto, logica de ente rationabili; ergo physiologiae obiectum est ens naturale*'.

[25] '*Ad quintum respondeo subiectum physiologiae esse res naturales*'.

[26] The *Compendium* clarifies that 'by nature is meant birth and generation, the essence of generable and corruptible things' (1999: 37).

[27] '*At in physiologia tractantur principia, causae, partes, et passiones, et mutationes omnes rerum naturalium, ergo, et c. Item tractantur omnia sub ratione naturae*'.

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> for our lives by means of medicine; another that investigates the motion, position, and magnitude of the stars, which they call astronomy; yet another one treats of the effects of the stars on the lower things, and is called astrology; one maps the places and forms of the bodies of the world, and is called cosmography, and another, dealing with the earth, is called geometry; but all these are one science of the one world and its bodies[28]. (Campanella 1638b: 347)

Natural science is therefore a single science: its partition is only due to human inability to devise natural *res* as a whole. At least one element should be highlighted: of the five disciplines listed by Campanella, no less than four inquire into the 'bodies' of the world and the universe – a clue that reveals Campanella's main interest at a time of unprecedented geographical explorations, political upheavals, and discoveries in astronomy. Yet, to preserve a unitary and all-embracing perspective, he makes clear that these sciences are but parts of one philosophy of nature (Campanella 1999: 39).

Let us now scrutinize the contours of philosophy of nature in relation to metaphysics. Two main features appear at this stage (the list could be longer): the historicity of knowledge and the problem of the universals.

The latter involves rethinking the universal in a more authentic and realistic sense. Campanella considers it evident that nature, much like Plato's ideas, proceeds from the indeterminate and generic to the specific and individual: from common to particular matter, from indifferent forms to individualized ones. The problem of the universal therefore implies reflecting on the relationship between idea and *ideatum*, first and second entities, the one and the many.

> We, on the other hand, say – we read in Book II of the *Metaphysics* – that in the real thing is the universal, that is, an idea from which similarity arises, which is the unity of the particulars; and for this reason it is not given to the particulars, which only exist in the lower nature, the aptitude of being in many by themselves, except through the idea: for man begets man, heat the heat, multiplying itself in the diffusion of the idea[29]. (Campanella 1638b: 106)

The problem of the historicity in science remains to be addressed. In Campanella's philosophy, as in other philosophical systems of early modernity, it represents a concern of extraordinary originality. Historicity means finitude: the value of scientific knowledge is never given as an absolute, but always in relation to a given experience,

[28] '*Naturalis vero ex historia elementorum, et syderum, et aquarum et lapidum, et metallorum, et plantarum, elicit propositiones universales, quidditates rerum corporearum exprimentes, et ex his considerat generationes, et corruptiones, mutationes, partes, principia, effectus, et usus, quo ad hominem et quo ad totam corporum naturam. Idcirco, et tempus, et locum, et quantitatem, et numerum ipsorum considerat. Sed cum non possent homines corpora omnia contemplari, diviserunt scientiam hanc, ut alia sit, quae de passionibus humani corporis consideret et in hoc vitae nostrae consulat per medicinam. Alia quae stellarum motus investiget, et situs, et quantitates quam dicunt astronomiam. Alia tandem, quae causalitatem syderum super res inferiores tractat quam dicunt astrologiam. et alia quae totius mundi delineat situm et corporum moles quam cosmographiam vocant, et aliam, quae telluris, geometriam; sed tamen omnes hae una sunt scientia unius mundi, suorumque corporum*'.

[29] '*Nos autem dicimus, in re esse universal, idest, ideam, a qua oritur similitude, quae est unitas singularium: et hac ratione non dari in singularibus, quae sola sunt in natura inferiori, aptitudinem essendi in multis per se, nisi per ideam: homo enim generat hominem, et calor calorem, multiplicando seipsum in diffusione ideae*'.

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not to the universality of experience. Science, in order to remain science, must indeed look at the object from a particular viewpoint. Only sensible experience is valid in science, i.e., immediate experience as it has been constituted through the logical tools of reason, the efficacy of which depends on how thoroughly and concretely they manage to represent experience within a particular scientific system. If the truth attained is truly a truth, it can be contrary neither to metaphysical nor to theological truths. Such is the claim that appears in full clarity in the *Apologia per Galileo*: Campanella has very sharp and modern ideas on the relationship between science and faith, and he voices them in quite dangerous ways for the time.

And yet, this originality had to come to terms with the claims of metaphysics to play a role in scientific questions. The result led the old science to fall apart without, however, being of any help to the new science. As a matter of fact, the devaluation of mathematics was not of much help to build a new science: if, for example, we look at astronomy – a discipline extolled by Campanella as emblematic of the greatness of human reason – we observe that this afflatus failed to produce new founding hypotheses, reducing astronomy to a docile tool for astrological rituals or millenarian doctrines.

From this point of view, Galileo, in a handwritten note to the *Considerazioni di M.* Vincenzo Di Grazia, expresses his admiration of Campanella's thought: '*Al p[adre] Camp[anella]. Io stimo più il trovar un vero, benché di cosa leggiera, che 'l'disputar lungamente delle massime questioni senza conseguir verità nissuna*' (Galilei 1932: 738).

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