WHY SHOULD WE PREFER PLATO'S "TIMAEUS" TO ARISTOTLE'S "PHYSICS"? PROCLUS' CRITIQUE OF ARISTOTLE'S CAUSAL EXPLANATION OF THE PHYSICAL WORLD

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WHY SHOULD WE PREFER PLATO'S *TIMAEUS* TO ARISTOTLE'S *PHYSICS*? PROCLUS' CRITIQUE OF ARISTOTLE'S CAUSAL EXPLANATION OF THE PHYSICAL WORLD

CARLOS STEEL

1. Aristotle emulating Plato

In the Platonic tradition there always has been a controversy on how to determine the specific purpose (σκοπός) of the different dialogues of Plato: for instance, is the *Phaedrus* about love or about rhetoric? what is the overall intention of the *Parmenides*, the Forms or the One? About the *Timaeus*, however, there seems to have been a consensus. As Proclus writes in the prologue to his Commentary, 'This whole dialogue has in all its parts as its purpose the explanation of nature (φυσιολογία)'. Even the introductory sections, the summary of the discussion in the *Republic* and the anticipation of the story about Atlantis, must be understood from this point of view, for they contain, in the mode of 'images and examples' (ἐν εἰκόσι καὶ ἐν παραδείγμασιν), a description of the fundamental forces that are at work in the physical world.[1] Also the long treatise on human nature, which concludes Timaeus' exposition, has ultimately a cosmological meaning: is Man not after all a microcosm wherein we find all elements and all causes of the great universe?[2] Therefore, it is 'in its entirety' that this dialogue must be understood as the most perfect expression of the science of nature (φυσιολογία), leaving none of the principal causes of nature unexamined.

One may doubt, however, whether it makes sense to return to the explanation of nature in the *Timaeus* after having studied the *Physics* of Aristotle. For if one may prefer Plato for his lofty metaphysical speculations, Aristotle undoubtedly holds the primacy when it comes to explaining the physical universe. Plato's *Timaeus* with its half mythological, half rational account of the generation of the world seems to be only an interesting anticipation of what Aristotle fully explains in a scientific manner. Therefore, such later commentators as Simplicius, though Neoplatonic in conviction, turned to Aristotle's works when they needed to describe the physical world. To be sure, they accepted that, on the fundamental level, there

[1] Cf. Proclus, *In Tim.* I 18-19; 4.11-26.

[2] For an attempt at a different reading of the *Timaeus*, wherein the ethical purpose of the cosmology is central, see my paper 'The Moral Purpose of the Human Body. A reading of *Timaeus* 69-72', *Phronesis*, 46 (2001) 105-28. An interesting alternative to Proclus' physical reading of the *Timaeus* is offered by Calcidius. In his interpretation, Timaeus attempts to consider the *iustitia et aequalitas* existing in the natural world.

is a full concordance between Plato and Aristotle, but when explaining the features of this world they preferred Aristotle's argument to Plato's more metaphorical language.

Such, however, is not Proclus' opinion. In his view, Plato's *Timaeus* is not a primitive antecedent of Aristotle's more developed and articulated views on nature, but the summit of all physical explanation, surpassing both the preceding and the subsequent natural philosophy. In fact, the entire physical project of Aristotle is nothing but the work of a zealous admirer (ζηλώσας), a follower who tried to be better than the master, but was so only in developing beyond measure the little details of the system.[3] This is evident not only from many arguments discussed in the *Physics*, but also from the general articulation of Aristotle's whole natural philosophy. 'It seems to me that the excellent Aristotle emulated the teaching of Plato as far as possible when he structured the whole investigation about nature'.[4] In fact, Aristotle's physical work can be articulated in the following way:

(1) The study of the general principles of natural things: form, matter, nature, the essence and principles of movement, time and place; Aristotle deals with all these topics in the *Physics* following Plato's treatment in the *Timaeus*.

(2) The study of principles specific to distinct realms of the universe.

(2.1) The common characteristics of the celestial realm, such as the fact that the heaven is ungenerated or the nature of what Aristotle calls a 'fifth element', which is nothing but what Plato calls the 'fifth figure'.[5] This is the subject of Aristotle's *De caelo*, which again is nothing but a development of the principles set out by Plato in the *Timaeus*.

(2.2) The common properties of the sublunary realm, which is subject to generation and corruption. Aristotle devotes to this examination his *De generatione et corruptione*, following again the guidance of the *Timaeus,* where the essences and powers of the elements are analysed as well as their opposition and harmony.

(2.2.1) In the sublunary realm meteorological phenomena constitute again a specific subject. In this domain, it cannot be denied, Aristotle has done much more than his master, as is clear from his *Meteorologica.* Whether he deserves much praise for that, is another question. According to Proclus he has developed the teaching of his master 'beyond what is needed' (πέρα τοῦ δέοντος).

[3] On Aristotle as emulator of Plato, see *In Tim.* I 6.21-24 (quoted in n.4); I 339.20; III 49.18; 323.32. Notice that according to Proclus, Plato himself emulates Homer and Pythagoras: cf. *In Remp.* I 3.17; 163.11f; 168.20f; 171.1f; 184.28f; 195.17f; *In Tim.* I 314.19; 333.21.

[4] *In Tim.* I 6.21-24: δοκεῖ δέ μοι καὶ ὁ δαιμόνιος Ἀριστοτέλης τὴν τοῦ Πλάτωνος διδασκαλίαν κατὰ δύναμιν ζηλώσας οὕτω διαθεῖναι τὴν ὅλην περὶ φύσεως πραγματείαν. In the next section I develop Proclus' argument in 6.22-7.16. Excellent annotations in A.J. Festugière, *Proclus. Commentaire sur le Timée*, vol. I, 30-31.

[5] In the Platonic school there always was a discussion on how to reconcile the Aristotelian doctrine about the 'fifth element' or 'ether' with the view expressed in the *Timaeus* that the whole universe is composed out of the four elements, though fire dominates in the heaven : see Proclus, *In Tim.* II, 42.9-44.24 and III, 112.19-133.10. Proclus suggests here that what Aristotle says about the 'fifth element' is not so different from what Plato meant when he attributed the fifth mathematical figure to the heaven (55c). Simplicius makes the same comment in his attempt to harmonize Plato and Aristotle: see *In Ph.* 1165.28-33 and *In De Caelo* 86-87.

(2.2.2) The same remark must be made about Aristotle's extensive zoological research. Whereas Plato limited himself in the *Timaeus* to an analysis of the fundamental principles of all living organisms, both their final causes and the subsidiary causes, Aristotle gave most of his attention to the material components of animals and scarcely, and only in few cases, did he consider the organism from the perspective of the form.

In sum, in all explanations of physical things Aristotle started from matter. This clearly shows how much he falls short in his physics of his master: ὅσον ἀπολείπεται τῆς τοῦ καθηγεμόνος ὑφηγήσεως. Plato indeed, when explaining the physical world, never became lost in a detailed examination of the variety of organisms and the diverse natural phenomena but, following the Pythagorean tradition, always set his mind on an understanding of the world within a metaphysical or, as Proclus would say, theological perspective. In Proclus' view the *Timaeus* is not only a φυσιολογία, a science of nature in all its aspects and divisions, but also an understanding of the whole of nature as proceeding from the demiurge, as expressing an ideal paradigm and as aiming at the ultimate Good. In short, his *physio*-logy is also a sort of *theo*-logy:

> The purpose of Timaeus will be to consider the universe, insofar as it is produced from the gods. In fact, one may consider the world from different perspectives: insofar as it is corporeal or insofar as it participates in souls, both particular and universal, or insofar as it is endowed with intellect. But Timaeus will examine the nature of the universe not only along all those aspects, but in particular insofar as it proceeds from the demiurge. In that respect the physiology is apparently also to be a sort of theology, since also natural things have somehow a divine existence insofar as they are produced from the gods.[6]

That Timaeus begins his exposition with an invocation of the gods (27c) is another indication that a full explanation of nature is not possible without linking it to the gods from whom all things proceed. By insisting on the necessity of this prayer, Proclus argues, Socrates requires that the explanation of nature be made in a Pythagorean manner, ie., starting from its divine causes, and not along the method he himself rejected in the *Phaedo*, that is, the procedure of Anaxagoras, who made 'air and ether' causes. 'For the true physiology must be attached to theology, as also nature itself depends on the gods.'[7]

2. Aristotelian and Platonic causes

The shortcomings of Aristotle's approach to physics come even more to the fore when we examine the types of causes he applies in his explanation of the universe. Here again he falls far behind the master he attempts to surpass. In the historical development of the φυσιολογία Proclus distinguishes three main periods. Before Plato, the philosophers (with

[6] *In Tim.* I, 217.18-27: ἔσται οὖν αὐτῷ περὶ τοῦ παντὸς ἡ θεωρία, καθ' ὅσον ἀπὸ θεῶν παράγεται τὸ πᾶν, ἐπεὶ καὶ πολλαχῶς ἄν τις τὸν κόσμον θεωρήσειεν, ἢ κατὰ τὸ σωματοειδές, ἢ καθ' ὅσον ψυχῶν μετέχει μερικῶν τε καὶ ὁλικῶν, ἢ καθ' ὅσον ἔννους ἐστίν. ἀλλ' ὅ γε Τίμαιος οὐ κατὰ τούτους μόνον τοὺς τρόπους ἐπισκέψεται τὴν τοῦ παντὸς φύσιν, ἀλλὰ διαφερόντως κατὰ τὴν ἀπὸ τοῦ δημιουργοῦ πρόοδον· οὗ δὴ καὶ ἡ φυσιολογία φαίνεται θεολογία τις οὖσα, διότι καὶ τὰ φύσει συνεστῶτα, καθ' ὅσον ἐκ θεῶν ἀπογεννᾶται, θείαν πως ἔχει τὴν ὕπαρξιν.

[7] *In Tim.* I, 204.3-10.

the exception of the Pythagoreans) were mainly interested in the search for the material cause, which they identified however in various manners. Even Anaxagoras, who seemed to have been more 'awake' than his contemporaries since he considered the intellect as cause, explained everything starting from material principles. 'Those who presided in the philosophical school after Plato, in particular the more accurate among them' deemed that the natural philosopher must not only study the material causes, but also and primarily the form. For matter and form are the principles of all corporeal things. The phrase 'the more accurate'(ἀκριβέστεροι) is clearly an indirect reference to Aristotle, who made indeed this claim in the prologue of the *De anima* (I, 1 403 b7-12). Compared to the generations after and before him, Plato stands out as the only philosopher who, in the tradition of the Pythagoreans, clearly examined in the *Timaeus* all the causes of the physical world, both the *primordial* causes and the subsidiary or *concurrent* causes (συναίτια). Of course, when explaining the physical world, Plato also applies the two types of causes of which Aristotle makes extensive use in his *Physics*, that is, the material and the formal causes. For what else is the 'receptacle' but matter? And what are the copies or images of the forms entering the receptacle but the material immanent forms? In Proclus' view, however, matter and form are nothing more than what Plato called in the *Timaeus* 'con-causes (συναίτια)'[8], 'subservient to the proper causes in the generation of things' as is said in the *Philebus*[9], 'tools' used by the real producers of things as we learn from the *Politicus*[10]. For as he himself formulates it in the *Elements of Theology*, the causes in the proper sense must never be constitutive parts or intrinsic elements of the things, or instruments used, but principles acting upon their effects from outside, while transcending them:

> *Every cause properly so called transcends its effect.*
>
> For if a cause were immanent in its effect, either it would be a complementary part of the latter or it would in some way need it for its own existence, and it would in this regard be inferior to the effect. That which exists in the effect is not so much a cause as a concurrent cause being either a part of the thing produced [sc. matter or form] or an instrument of the producer. (.....) Therefore every cause properly so called (...) transcends the instruments, the elements [matter and form] and in general all that is described as concurrent cause.[11]

Such are indeed the three primordial causes which Plato introduces in the *Timaeus*: the efficient or productive cause (ie. the demiurge), the paradigmatic cause (the ideas) and the

[8] See *Tim.* 46c-d; cf. *Polit.* 281c-e; 287b-d.

[9] See *Phileb.* 27a8-9: οὐ ταυτὸν αἰτία τ' ἐστὶ καὶ τὸ δουλεῦον εἰς γένεσιν αἰτίᾳ. This text is often used by Proclus to explain the meaning of συναίτιον: cf. *El. theol.* 75.8; *In Tim.* I, 298.26; 369.8; *In Eucl.* 139.20.

[10] See *Polit.* 281 e1-3: ὅσαι μὲν τὸ πρᾶγμα αὐτὸ μὴ δημιουργοῦσι, ταῖς δὲ δημιουργούσαις ὄργανα παρασκευάζουσιν, ὧν μὴ παραγενομένων οὐκ ἄν ποτε ἐργασθείη. This passage functions as the Platonic authority for the notion of the 'instrumental cause'.

[11] See *El. theol.* prop. 75: πᾶν τὸ κυρίως αἴτιον λεγόμενον ἐξῄρηται τοῦ ἀποτελέσματος. ἐν αὐτῷ γὰρ ὄν, ἢ συμπληρωτικὸν αὐτοῦ ὑπάρχον ἢ δεόμενόν πως αὐτοῦ πρὸς τὸ εἶναι, ἀτελέστερον ἂν εἴη ταύτῃ τοῦ αἰτιατοῦ. (...) ἅπαν ἄρα τὸ κυρίως αἴτιον (...) καὶ τῶν ὀργάνων ἐξῄρηται καὶ τῶν στοιχείων καὶ πάντων ἁπλῶς τῶν καλουμένων συναιτίων. Translation adapted from E. R. Dodds. Simplicius expresses a similar view in his commentary on the *Physics*, 315.10-12: 'the properly efficient cause must be separate and transcendent from the effect, for the cause immanent in the effect, such as the form and nature, comes close to the formal principle.'

final cause (the Idea of the Good). This again shows the importance of this dialogue; we find here for the first time an articulated exposition of the whole system of causes: the primordial causes (efficient, paradigmatic and final) and the subservient (matter and form[12]). Therefore Plato's *Timaeus* presents the most perfect form, the summit of the φυσιολογία.

In this presentation of the development of natural philosophy Proclus clearly took his inspiration from the historical survey Aristotle made in *Metaphysics* A. Yet he turns this scheme against Aristotle himself. Being convinced that he was the first to have clearly articulated the four types of causality (material, formal, efficient and final), Aristotle evaluated his predecessors to the extent that they had acceded to the knowledge of this fourfold causality. Thus he finds in Plato only two types of causes, the material and the formal. Scholars since Alexander of Aphrodisias always have expressed their surprise at this misrepresentation, for Aristotle certainly knew that Plato had introduced the demiurge as efficient cause and taken the Idea of the Good as the ultimate (final) principle of explanation. It may seem that Proclus finds some pleasure in distorting in his turn the historical truth. In his view, it is Plato who represents the zenith in the gradual search for the causes. After him begins the decadence and the loss of the most profound insights. Compared with Plato's sublime views, Aristotle is only a mediocre thinker, for he only speaks of two subservient causes, matter and form. Whereas Aristotle criticised his predecessors for not having fully distinguished the causes, he is now censured in his turn for such a rudimentary simplification, having reduced the full system of causes discovered by Plato to only matter and form.

An Aristotelian might protest against such a distorted view. To be sure, Aristotle explicitly refuses to admit paradigmatic forms as causes and he gives good reasons for that. But he does accept the final and efficient causality in all his explanations and in particular in his biological work. After all, 'nature' is the principle of all movement and change. But Proclus argues that nature as understood by Aristotle cannot really be a productive or creative principle, because it is devoid of all inherent formative principles (λόγοι), which, according to the Neoplatonic view, proceed from the immaterial Forms in the Intellect. Since Aristotle rejects the Platonic Forms as causes, he thereby abolishes the creative character of nature itself, reducing it to nothing but an intrinsic moving force in material things.[13] As Proclus notices in an interesting digression in the prologue (9.25-12.26), the term φύσις is used by philosophers in many different senses. Some identify nature with matter or with the material form or with the whole composite body or with its qualities. Compared with the distorted views of both his predecessors and followers, Plato again stands out with his 'most accurate doctrine' on nature. He places nature as a principle between the material form (identified with nature by the Aristotelians) and the soul. As a creative and productive principle it must somehow transcend the body it organizes through its inherent λόγοι. It is, however, inferior to the soul, because it is divided in the body, cannot detach itself from it and has no capacity of reflexivity. Nature is, then, in this Platonic view the last of the really creative causes, the ultimate limit of the presence of the incorporeal in this sensible world, informing all things with the reason-principles and powers received from above. In this sense, it may be said to be the 'instrument (ὄργανον) of the gods' (12.21). For, as Proclus further explains, nature

[12] To which must be added the instrumental cause, as we will see.

[13] Cf. *In Tim.* I, 10.20-21; 11,15.

is used as an instrument by the demiurge in the creation of the world, whereby the demiurge works in a transcendent manner, nature as it were being 'submerged in the bodies'.[14]

With such a narrow understanding of nature, it must come as no surprise that Aristotle also admits cases of 'spontaneous generation' in the sublunary realm, which again restricts the purport of efficient causality. Moreover, because of his rejection of the demiurge, Aristotle is also forced to limit efficient causality to the sublunary realm. In fact, in his view there is no cause of existence of the celestial bodies or of the sensible world as a whole: they exist necessarily in all eternity. But as Proclus argues, such a position will force him to admit either that the world has the capacity to produce itself (ἑαυτοῦ παρακτικόν) or that it owes its origin to chance: ἀπὸ ταὐτομάτου. However, to admit that this universe is self-constituted will lead to all possible absurd consequences, as Proclus shows in *In Parm.* III, 785ff. For only incorporeal beings have the capacity to act upon themselves, to move themselves and generate themselves. But how could this sensible world be self-constituted? It seems, then, that this world is the result of chance. In this respect, the Aristotelians are no better than the followers of Epicurus who let the whole world originate from chance. The Aristotelians, Proclus says, respect the principle of causality only by name, for since they also rank chance among the causes, they reduce the cause to something that is without a cause.[15]

For all these reasons we may understand why Proclus maintains that Aristotle did not grasp what is really the productive cause. For Aristotle's ultimate explanation of natural processes is 'nature', which, however, in the Platonic view, is only an 'instrumental cause' and not the first cause of a movement: it only moves insofar as it is itself moved by a higher cause. As Simplicius says, even Alexander had to admit that nature, which is an intrinsic principle in things, is not really an efficient cause (ποιητικόν), since this cause must be separate from the thing produced.[16] Therefore, Simplicius maintains as Proclus that Plato is the first to have introduced the properly productive cause (κυρίως ποιητικόν), namely the demiurgic Intellect, whereas Aristotle in his *Physics* rather searches for the proximate cause of movement, nature, which Plato only considered as an instrument. However, Simplicius, always inclined to harmonize both authorities, insists that Aristotle too, as we learn from the end of the *Physics*, introduced besides the proximate moving cause ('nature') a transcendent immaterial cause as the ultimate explanation of all physical processes.[17] Even Proclus is forced to accept that, for after having criticised 'the Aristotelians' for having admitted chance in the world, he quotes with approval Aristotle's claim in *Metaph.* Λ 10 that there must be one transcendent principle explaining the order in the universe.[18]

[14] Cf. *In Tim.* I, 143.19-22.

[15] Cf. *In Tim.* I, 262.5-9: τοῖς δὲ 'Αριστοτελικοῖς ὀνόματι μόνον αἰδοῦς ἠξίωται. λέγουσι μὲν γὰρ ὑπ' αἰτίου τινὸς πάντως γίνεσθαι τὸ γιγνόμενον, ἀλλὰ τὸ αἴτιον ἀναίτιον λανθάνουσι ποιοῦντες, ὁπόταν καὶ τὸ αὐτόματον τοῖς αἰτίοις ἐγκαταλέγουσιν. αὐτὸ γὰρ τοῦτό ἐστι τὸ αὐτόματον, τὸ ἀναίτιον.

[16] Cf. Simplicius, *In Ph.* 315.6ff. Alexander, of course, did not anticipate the Neoplatonic view. What he meant, was that nature rather belongs to formal than to efficient causality. See also the text of Simplicius cited in n. 11.

[17] See Simplicius, *In Ph.* 8.3-11: 'Αριστοτέλης (...) τὸ προσεχὲς ζητῶν τῶν φύσει γινομένων ποιητικὸν αἴτιον τὴν φύσιν εἶναί φησιν, ἣν ὁ Πλάτων ἐν τῷ ὀργανικῷ τέθεικε κινουμένην μὲν ὑφ' ἑτέρου, κινοῦσαν δὲ ἕτερα. οὐ μέντοι οὐδὲ 'Αριστοτέλης ἐπὶ τῆς φύσεως ἔμεινεν ὡς ἐπὶ πρώτης ἢ κυρίως ποιητικῆς, ἀλλ' αὐτὸς ἐπὶ τὸ ἀκίνητον καὶ πάντων κινητικὸν αἴτιον ἀνῆλθε καὶ πάντα τούτου ἐξῆψεν. Cf. also *In Ph.* 223.18; 284.31; 315.18; 316.10; 317.24; 318.20.

[18] See *In Tim.* I, 262.25-27.

Already in Middle Platonism various attempts had been made to integrate the Platonic system of causes within the Aristotelian format.[19] In Plato's work, it was argued, one can find the four types of causality distinguished by Aristotle and, besides, the paradigmatic cause, which Aristotle wrongly rejected. This is the '*turba causarum*' which Seneca introduces in his celebrated letter 65. To the four (Aristotelian) causes, he says, Plato added a fifth cause, the paradigm (*exemplar*) which he himself called 'idea'. Hence, there are altogether five causes: '*quinque ergo causae sunt, ut Plato dicit: id ex quo* (ie. the material cause), *id a quo* (ie. the efficient), *id in quo* (ie. the formal), *id ad quod* (ie. the paradigm), *id propter quod* (ie. the final)'. We have in this text already the complete system of causes that Proclus presents as the characteristic contribution of Plato, with the exception of the instrumental cause.[20] We find this list of six causes (with the corresponding prepositions) throughout the work of Proclus and the later Neoplatonic tradition. An excellent summary is given in *In Alc.* 168.21-169.2:

> The producer is cause as that by which, the instrument as that through which; just as the end is usually called that on account of which, the exemplar that in view of which, the form that in accordance with which, the material cause, as Aristotle has it, that out of which, or as Timaeus asserts, that in which.[21]

Thus, the discussion about the understanding of Platonic causality, which began in middle Platonism in order to justify Plato in the confrontation with Aristotle, seems to have come to its completion in the Neoplatonic school. We should, however, beware of the harmonizing interpretation advocated by Simplicius, which is still dominant in modern scholarship. What Plato understood by causes cannot simply be integrated in an Aristotelian model or vice versa.[22] Proclus, as we have seen, is convinced of the radical difference between the Aristotelian and the Platonic understanding of causality. The Aristotelian explanation of the world never rises to the level of proper causality. Aristotle's celebrated four causes are only applicable to the understanding of what happens on the sublunary level. In the Platonic view, those are only subsidiary, subservient and instrumental causes. For an understanding of what the true causes are of all things, we must follow Plato who lifts us up to the level of the Ideas,

[19] For the different types of cause attributed to Plato in the tradition, see H. Dörrie and M. Baltes, *Der Platonismus in der Antike*. Bd. IV, I, *Bausteine 101-124* (Stuttgart-Bad Cannstatt 1996) 118-201; 387-538; and R. W. Sharples, 'Counting Plato's principles' in *The passionate intellect*, Rutgers Studies in Classical Humanities, VII, ed. L. Ayres (New Brunswick 1995) 76-82; and most recently J. Mansfeld, 'Plato, Pythagoras, Aristotle....on causes' in *Antichi e moderni nella filosofia di età imperiale*, ed. A. Brancacci (Naples 2001) 29-36 with further bibliography.

[20] It seems that Alexander of Aphrodisias was the first to have conceived of instrumental causality. See Simplicius, *In Ph.* 315.17-18 ὅτι συγχωρεῖ ὁ Ἀλέξανδρος καὶ τὸ ὄργανον αἴτιόν πως εἶναι· εἰ καὶ μὴ κυρίως ποιητικόν, ἀλλ' αὐτὸ τοῦτο ὀργανικόν.

[21] *In Alc.* 168.21-169.2: ἔστι δὲ τὸ μὲν ποιοῦν αἴτιον ὡς τὸ ὑφ' οὗ, τὸ δὲ ὄργανον ὡς τὸ δι' οὗ· καθάπερ δὴ καὶ τὸ μὲν τέλος εἴωθε καλεῖσθαι δι' ὅ, τὸ δὲ παράδειγμα πρὸς ὅ· καὶ τὸ μὲν εἶδος καθ' ὅ, τὸ δὲ ὑλικὸν αἴτιον, ὡς μὲν Ἀριστοτέλης φησὶν ἐξ οὗ, ὡς δὲ ὁ Τίμαιος ἐν ᾧ. Translation adapted from W.O'Neill (The Hague 1971) 112. For other parallel texts see the excellent 'note complémentaire' in the edition of A. Segonds (Paris 1985) 386 (n.5 ad p. 231). See also L. G. Westerink in his edition of Damascius, *Lectures on the Philebus* (Amsterdam 1959) 55-56.

[22] For the tendency to understand Plato's doctrine of the causes from the perspective of Aristotle, see the critical observations of C. Natali, 'Le cause del *Timeo* e la teoria delle quattro cause' in *Interpreting the Timaeus-Critias*, eds T. Calvo and L. Brisson (Sankt Augustin 1997) 207-13.

makes us understand the role of the demiurge and ultimately the cause of all aspirations, the Good.[23]

From all these considerations we may conclude that much more is at stake in this discussion than a different enumeration of causes, four, five or six. The concept of causality of the Neoplatonic philosophers is quite different from that of the Peripatetics, even if they share the same terms, such as final or productive-efficient cause. As we have seen, Aristotle's causes are primarily intended to explain how things move and change, come to be and cease to be. For the Neoplatonists, on the contrary, the doctrine of the causes must elucidate how all levels of being proceed from the First. For that reason Proclus insists that the principle of causality as formulated in the *Philebus* – 'that everything that comes to be comes to be through a cause' (26e) – is of much wider application than the similar axiom from the *Timaeus*. The causality principle in the *Philebus* is about constitutive principles of being (ὑποστατικά) and it can be, analogously, used to explicate relations between all levels of being. Thus we can say of the One that it is the cause of the Intellect, and of the Intellect that it is cause of the Soul. In the *Timaeus*, however, the main interest is to understand what is the cause of the sensible world and all the encosmic beings: this is primarily the demiurge or creator of the world (the One is not the 'creator' of the Intellect).[24]

Accordingly the efficient cause (if understood in the strong sense of 'productive' or 'creative', not just moving) has for the Neoplatonists primacy over the other types of causality. For matter, form and instrument are not really causes, but subservient to the causes, and the paradigmatic and the final cause are not directly causes of the effects, but are so only through the mediation of the producer-maker.[25] Therefore the major task set for Timaeus is 'to find the maker and father of the universe' (28c). This, however, does not mean that the notion of cause 'had been narrowed down to fit the (Aristotelian) notion of the active cause',[26] for as we have seen, only in an essential connection with the ideal forms is the productive cause really productive.

Plutarch of Athens, the master of Syrianus, adopted the Neoplatonic doctrine of causality in his interpretation of the final section of the *Parmenides*. In his view, the five positive hypotheses, drawing the conclusions following from the position of the One, correspond to the five different levels of causality. The three first, which examine how the One is related to itself and the Others, concern the three principal causes (ἀρχικαὶ αἰτίαι), which are transcendent (ie., the One, the Intellect and the Soul); the two others, which consider how the Others are related to themselves and to the One, introduce form and matter. 'For these are truly *other* and belong to others rather than to themselves, and are concurrent causes

[23] In his Commentary on the *Metaphysics* Syrianus, Proclus' master, criticises Aristotle for taking matter, form and privation as causes, whereas only the transcendent Forms are really causes: they are not only paradigms, but also productive and final causes: cf. 117. 8-12.

[24] For a confrontation of the notion of causality in *Philebus* and *Timaeus*, see *In Tim.* I, 260.20-25 and 262.29-263.19; *In Parm.* 910-11.

[25] This is the view of Iamblichus as quoted by Simplicius, *In Cat.* 327.6ff. Proclus defended a similar view in his commentary on the *Philebus*: see Damascius, *In Phileb.* 114.1-9.

[26] M. Frede uses the texts of Iamblichus and Damascius (quoted in n. 25) as a supplementary argument to indicate a tendency in later antiquity 'to narrow down the notion of cause to fit the notion of an active cause'. See 'The original notion of cause' in M. Frede, *Essays in ancient philosophy* (Oxford 1987) 126-27.

(συναίτια) rather than causes, following the distinction made in the *Phaedo*.'[27] It is in this Neoplatonic tradition that we must situate the celebrated Arabic treatise 'De causis' which had such an extraordinary fortune in the Middle Ages. The title of this work is somehow misleading. About the causes of the physical world in the Aristotelian sense nothing can be learned from this treatise, which is an adaptation of Proclus' *Elements of Theology*. In fact, the 'causes' that are discussed here are the three 'principal hypostases' from the Neoplatonic tradition: the One-Good, the Forms and the Soul, which constitute the incorporeal 'separate' realm. They are, indeed, as we have seen, the only causes in the proper sense of the term.

Therefore, a complete philosophical understanding of the physical world is not possible without making use of all the causes we have distinguished.

3. The axiomatic structure of the Platonic physics

Before attacking the real subject of his discourse, the explanation of the generation of the world, Timaeus sets out the fundamental principles or, as Proclus says, the 'hypotheses', which will govern his whole explanation of the physical world: *Tim.* 27d5-28b5.[28] As Proclus explains, Timaeus follows here again the scientific method of the Pythagoreans. In order to make the *physiologia* a real science, the philosopher must develop his explanation, as does the geometer, from a set of fundamental propositions or axioms:

> If I may say what I think, it seems to me that Plato proceeds here in the manner of the geometers, assuming before the demonstrations the definitions and hypotheses through which he will make his demonstrations, thus laying the foundations of the whole science of nature.[29]

For every type of science (such as arithmetic, music or mechanics) there must be a different set of axioms. It is precisely the task of a scientist to formulate at the start of his enterprise the principles proper to that particular science and not just to assume some general axioms. The science of nature too is based on specific axioms and assumptions, which must be clarified before we can move to the demonstration. This is what Timaeus as a trained Pythagorean scientist knows well. Therefore at the very beginning of his discourse on the generation of the world, he formulates clearly the fundamental suppositions of his science of nature. Proclus distinguishes five such hypotheses: two definitions, two axioms and the position of the name.[30]

> (1) The definition of what is really being: 'that which is apprehensible by thought together with reason' (28a1-2)

[27] See *In Parm.* VI, 1059.11-19 (modified translation G. Morrow-J. Dillon)

[28] In this last section I follow closely Proclus' excellent commentary ad 27d5-28b5 (= *In Tim.* 1.223.5-274.32). For a recent scholarly assessment of this proemium see D. Runia, 'The literary and philosophical status of Timaeus' prooemium' in *Interpreting the Timaeus-Critias*, above n.22, 101-18.

[29] *In Tim.* I, 236.13-18: εἴ με δεῖ ... τὸ δοκοῦν εἰπεῖν, ἔοικεν ὁ Πλάτων ὥσπερ οἱ γεωμέτραι πρὸ τῶν ἀποδείξεων ὅρους παραλαμβάνειν καὶ ὑποθέσεις, δι' ὧν ποιήσεται τὰς ἀποδείξεις, καὶ ἀρχὰς προκαταβάλλεσθαι τῆς ὅλης φυσιολογίας. For the 'geometrical method' see also 228.27; 229.1-3; 258.12; 272.11.

[30] Cf. *In Tim.* I, 236.21-27.

(2) The definition of what is becoming: 'that which is object of opinion together with irrational perception' (28a 2-4)

(3) The principle that 'without a cause nothing comes to be' (28a4-6)

(4) The principle that 'something made after a model that is always unchanging must be beautiful' (28a6-b1) and 'that something made after a model in change will not be beautiful' (28b1-3)

(5) The imposition of the name of the universe, 'let us call it heaven (οὐρανός) or world (κόσμος)' (28b3-5)

In passing Proclus notices how in this respect also Aristotle tried to imitate the wonderful scientific order of the *physiologia* of Timaeus. For he too begins his *Physics* with some fundamental assumptions (cf. I 2, 185 a 12: ἡμῖν δ' ὑποκείσθω) and, in his *De caelo*, he likewise formulates a number of hypotheses from which all arguments follow.[31] But here again the axioms set out by Timaeus are much more fundamental.

In fact, starting from those fundamental propositions, Proclus argues, we can deduce the different types of causality that are required for any scientific understanding of nature. Thus from the first two hypotheses we reach the notions of the subsidiary causes, matter and form. From the third we may discover the notion of the efficient causality; from the fourth we come to the insight of the paradigmatic cause. Finally, also the giving of the name – which will not be recognised as a fundamental axiom by modern scholars – has a fundamental role, for it makes us understand the function of the Good or the final cause, as we shall see.

Let us then explain the notions of causality that are implied in those five basic propositions.

(1) and (2): Two definitions.

The very first problem to be discussed by Timaeus is the question 'whether the world has always been or has come to be (γέγονεν)'. It is from the determination of this problem that will follow all the other problems that Timaeus must confront. For if the world is generated, it must have a cause, etc. In order to understand this seminal problem, we must of course understand what is presupposed by the notions γενητόν and ὄν. That is the function of the two first definitions. Therefore Timaeus had to put those definitions before all other axioms. For just as from a right determination of the first problem ('has the world come to be?') follow all other problems concerning the world, so also all other axioms follow from the right understanding of those preliminary definitions.[32]

Proclus notices that Timaeus does not demonstrate that there is a realm of (intelligible) Being distinguished from the realm of Becoming. He simply assumes what it is. Here again he refers to the method of the geometer who, at the beginning of his science, defines what a point is and what a line, but does not demonstrate that points or lines exist. Such a demonstration would force him to go outside the limits and principles of his own science: it

[31] See *In Tim.* 1.237.24-238.4; Proclus refers here to Plotinus, II 1.2.12f, who distinguishes five hypotheses (see excellent note by A.J. Festugière, vol. 2, 68-69).

[32] Cf. *In Tim.* I, 326.1-13.

is indeed a metaphysical question. In the same manner the natural philosopher will assume what real being is, without demonstrating that this realm exists.[33]

But how can we discover through those definitions of 'what is always' and 'what is becoming' the notion of the subsidiary causes, that is, 'the causes constitutive of the universe, matter and form'?[34] Those causes are required to explain what it means for something to be γενητόν and not ὄν. In fact, if this sensible world is not a being but a reality coming to be, it will be corporeal. Hence there must exist forms participated by matter, and matter receiving them, and a proximate cause of movement, ie., nature.[35] The definition of becoming as distinguished from being thus makes us grasp the necessity of the subservient causes, material, formal and instrumental.

(3) First axiom

If the world is generated, following the third axiom, it is also evident that it must have an efficient cause, for 'without a cause nothing comes to be'. As Proclus explains, in this axiom 'cause' does not signify every type of causal agency, but specifically the 'efficient demiurgic cause'. For as we have learned from a comparison with the parallel formulation of the causal principle in *Philebus* 27 a1-b2, the demiurgic cause must be distinguished from the more fundamental sense of causality, to be cause of existence (ὑποστατικόν). We speak of demiurgic activity only with respect to the production of the sensible universe.[36] In this sense the notion of efficient causality is necessarily implied in the notion of 'generated'. If this world is generated, it must have an efficient cause.

(4) Second axiom.

If the world is generated, it must have an efficient cause. If it has an efficient cause, it must have a paradigm, at least if we take 'efficient' in the strong sense of 'productive' or 'creative' and not in the loose Aristotelian sense of 'initiating a movement'. For a productive cause always produces in view of a certain form of which it wants to bring forth a particular copy. The fourth axiom introduces the notion of the model with an important distinction corresponding to the twofold definition with which we started: the model can be eternal or changing. The eternal model corresponds with the notion of the paradigmatic cause. For Proclus this notion is essentially linked to the strong sense of the productive cause. That Aristotle rejected the Platonic hypotheses of the Forms made it impossible for him to conceive the divine intellect as an efficient cause. The self-thinking intellect is only a final cause of this world, explaining its movement, not a transcendent creator and providence.[37]

[33] Yet, as Proclus insists, Timaeus is much more than a 'natural philosopher', he is a Pythagorean, which means that he always tries to connect physical considerations to more sublime speculations about the causes. Therefore, he offers later in his discourse (50b-52d) a demonstration for the existence of the Forms: see *In Tim.* I, 237,4-8; 228.28-229.3.

[34] Cf. *In Tim.* I, 237.9-12: καὶ ἔοικε τὸν μὲν ὅρον τοῦ ἀεὶ ὄντος καὶ τοῦ γενητοῦ ζητεῖν, ἵνα εὕρῃ τὰ αἴτια τὰ συμπληροῦντα τὸ πᾶν, τὸ εἶδος καὶ τὴν ὕλην· τούτων γὰρ δεῖται τὸ γενητόν.

[35] Cf. *In Tim.* I, 263.25-27.

[36] Cf. *In Tim.* I, 260.19-28; see also above p. 181.

[37] Cf. *In Tim.* I, 266.21-268.24. For Proclus' critique on Aristotle for not considering the Intellect as a truly efficient cause see C. Steel, 'Proclus et Aristote sur la causalité efficiente de l'intellect divin', in *Proclus, lecteur et interprète des Anciens*, eds J. Pépin and H. D. Saffrey (Paris 1987) 213-25.

(5) Imposition of the name.

> The whole *Heaven* or *World* or *whatever* it may prefer to be called, that will also be its name for us (28b3-5).[38]

In talking about the universe, this 'sensible god', Timaeus is careful to call it by the right name. οὐρανός and κόσμος are the traditional names given to the world, but maybe there are other names unknown to us. Modern commentators would not consider this imposition of names as the 'last of the axioms', as does Proclus (272.10f.) They connect it with the following section as an incidental remark before the first problem is addressed. Thus Cornford:

> So concerning the whole Heaven or World – let us call it by whatsoever name may be most acceptable to it – we must ask the question....

or in a more modern version (but not an improvement) by D. Zeyl:

> Now as to the whole universe or world order – let's just call it by whatever name is most acceptable in a given context – there is a question we need to consider first.

We have translated the text literally as Proclus understood it, that is, as an independent sentence not grammatically linked with what follows. For Proclus this is not the beginning of a new argument, but the last of the set of fundamental axioms of the physics. As he writes, Timaeus here again follows the method of the geometers who at the beginning of their demonstration define the names they will use. This is what Euclid does in his *Elements* (2 def. 2) where he stipulates that the name 'gnomon' be given to a particular surface in a parallelogram. But how does the imposition of names for the universe make us discover the final cause, as was said earlier? As Proclus explains, the two names used in the tradition stand respectively for the procession of the universe from its father (κόσμος) and for its reversion upon its source (οὐρανός). There is however also an ineffable name of this universe, known only to the gods, which expresses the fact that it 'remains' in the father. The three names thus express the threefold circular dynamism of the universe in relation to its transcendent Cause:

> Through those three names you may find the final cause because of which the world is full of good, remaining in an ineffable way, proceeding in a perfect manner, returning towards the good as the object of its aspiration.[39]

To discover the final cause in the imposition of names for the universe is indeed a hermeneutic tour-de-force. Proclus however is forced to do so because the notion of the final cause could not be lacking among the fundamental axioms of the science of nature. Fortunately – for Proclus and us – Timaeus explains more clearly what the final cause is when he starts his explanation of the creation of the world in 29 d6-e1: 'let us, then, state for

[38] *Tim.* 28b2-4: ὁ δὴ πᾶς οὐρανός – ἢ κόσμος ἢ καὶ ἄλλο ὅτι ποτὲ ὀνομαζόμενος μάλιστ' ἂν δέχοιτο, τοῦθ' ἡμῖν ὠνομάσθω – σκεπτέον δ' οὖν περὶ αὐτοῦ.

[39] *In Tim.* I, 274.25-30: καὶ ἔχοις ἂν τὸ μὲν ἄρρητον ὄνομα τῆς τοῦ παντὸς ἐν τῷ πατρὶ μονῆς, τὸ δὲ κόσμος τῆς προόδου, τὸ δὲ οὐρανὸς τῆς ἐπιστροφῆς, διὰ δὲ τῶν τριῶν τὴν τελικὴν αἰτίαν, δι' ἣν τοῦ ἀγαθοῦ πλῆρές ἐστι, μένον μὲν ἀρρήτως, προϊὸν δὲ τελείως, ἐπιστρέφον δὲ ὡς πρὸς ἐφετὸν τὸ ἀγαθόν.

what reason becoming and this universe were assembled by him who made them. He (namely the demiurge) was good'. This section is indeed the 'locus classicus' on final causality in the *Timaeus*. As Proclus explains, Timaeus begins his exposition of the creation of the universe with the notion of the Good, knowing that the discovery of the final cause is the most excellent starting point for the explanation of the world. For all things exist and act in view of the good. Therefore Timaeus will eventually attach all other causes to this cause:

> For having discovered through the basic suppositions the form of the world and the paradigmatic and the efficient cause, Timaeus now wants to designate the most sovereign and most venerable of all causes, the final cause, which cause one must above all desire to grasp when dealing with the whole creation.[40]

In this sense all causes required for a scientific understanding of the universe have been rationally deduced at the beginning of the argument. Even if one may object against some forced interpretations, one must agree that Proclus has excellently understood the vital importance of this axiomatic introduction for the understanding of the whole φυσιολογία. Only through those axioms and the notions of causality they involve is it possible to develop a truly scientific understanding of this sensible world in becoming.

A righteous Aristotelian might not be convinced. He could object that the principles explaining a particular genus must not be taken outside that genus. By moving to transcendent principles Proclus tends to make his physics an applied theology! But this is exactly the ambition of Proclus, hereby following the inspiration of Iamblichus. As the Syrian philosopher used to say, the whole Platonic philosophy is contained in two dialogues, the *Parmenides* and the *Timaeus*, the one dealing with the things beyond the world (theology), the other explaining the things in the world (physiology). Between both dialogues there exist many remarkable similarities in the 'mode of exposition'. For just as Timaeus reduces all cosmic processes to the one demiurge, so Parmenides makes all beings depend on the One.

> As Parmenides in conducting an inquiry about beings, is examining these beings insofar as they are derived from the One [that is, he is not just doing onto-logy, but theo-logy], so also Timaeus does not simply inquire about nature in the usual manner of the natural scientist, but insofar as all things receive their cosmic ordering from the demiurge.[41]

Without such a metaphysical-theological perspective, Proclus believes, there is nothing worth investigating in this changeable world, though we may find some pleasure in the description of some phenomena. Proclus made an excellent case in proving the scientific character of the *Timaeus*. But probably only those sharing his theological conviction will admit that the *Timaeus* surpasses the *Physics* as a project of natural science.

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[40] *In Tim.* I, 356.11-16: τὸ γὰρ εἶδος τοῦ κόσμου διὰ τῶν ὑποθέσεων ἀνευρὼν καὶ τὸ παραδειγματικὸν καὶ τὸ ποιητικὸν αἴτιον νῦν ἐθελήσει τὴν κυριωτάτην καὶ πρεσβυτάτην ἀποδοῦναι τῶν αἰτιῶν, τὴν τελικήν, ἣν δεῖ διαφερόντως ἐπὶ τῆς ὅλης δημιουργίας ἐπιποθεῖν.

[41] See *In Parm.* 641.25-31 (modified version of Morrow-Dillon: for the sake of the argument I have reversed the terms of the comparison). Same argument in the prologue of *In Tim.* I, 13.14-14.1.