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Proclus on Indivisible and Continuous: Aristotelian Physics *vs.* Platonic Theology[*]

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Abstract. In his *Physica*, Aristoteles introduced several terms to describe geometrical entities and their properties, such as 'continuous', 'divisible' and 'indivisible', in order to explain the nature of space, motion, and time. Proclus, in his *Institutio physica*, summarises Aristotelian propositions and their proofs and gives a comprehensive description of mathematical objects using the same language, which he used to describe metaphysical entities in his other works. It appears that Aristotelean physics and Platonic metaphysics have common points, at least from the standpoint of the terms used. Actually, this similarity appears to be more than purely linguistic. The concept of divisibility / indivisibility is widely used to distinguish properties of the intelligible and sensible realms. Another term, *synechēs*, is used both to describe the spatial continuum (and continuous objects) and the capability of intelligibles to 'hold themselves together' and, further, to be spread over material objects in a non-spatial and non-extensive manner. Despite the significant difference between these meanings, Proclus has a common philosophical ground for them, and thus it becomes possible to 'bridge' physics and metaphysics. The reported study considers two ways of such 'bridging': a 'downward' path from metaphysics to geometry, and an opposite 'upward' path, from geometry to metaphysics. A symbolical of connecting the two is proposed as the most appropriate to Proclean theurgic philosophy.

Keywords: Proclus Lycius, Aristoteles, indivisible, continuous, discrete, geometry, metaphysics, Neoplatonism.

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Платоновские исследования / Platonic Investigations 17.2 (2022) DOI: 10.25985/PI.17.2.05

[*] Исследование выполнено при поддержке Российского фонда фундаментальных исследований, проект № 21-011-44078 «Слово Бога и Книга Природы в фокусе человеческого познания (Взаимодействие христианской теологии и науки на разных исторических этапах)».

The *Institutio physica* by Proclus is a brief and little-known writing, which is primarily a systematic synopsis of Aristotelian *Physica*, books six, seven, and the third chapter of book five. This work starts with the definitions of indivisible, continuous, their relations, and types of motion of a material point. Proclus repeats and sometimes develops Aristotelian theorems on movement, including those which Aristoteles dedicated specially to solving the aporias of Zeno.

The *Institutio physica* significantly differs from the *Physica* of Aristoteles due to the strict structure of Proclus' treatise and profound classification of geometrical and physical subjects. Doubtlessly, the *Institutio physica* is much easier to read and understand than the original text of Aristoteles.

Below, we are going to trace how Proclus interpreted Aristotelian concepts of indivisible and continual — firstly, in the geometrical sense, and then from the metaphysical standpoint, or, in other terms, in physical and theological aspects.

1. Aristotelian discourse of indivisible and continual

In the *Institutio physica*, Proclus starts his synopsis of the *Physica* from the primary definitions:

> I. C o n t i n u o u s are those, which borders are an entity.
> II. C o n t i g u o u s are those, which borders are joint.
> III. A d j a c e n t are those, which have nothing homogeneous [to them] in between.[1]

After another three definitions of time and place of motion, Proclus gives the following theorems that consider the indivisible or, more precisely, unparted, ἀμερής, i.e. that which has no parts and therefore is united and simple. The second object of discussion is the abovementioned *continuous*, συνεχής, which can also be translated as 'successive'

[1] Procl. *Inst. phys.* 1, 2.5–7 Ritzenfeld: I. Συνεχῆ ἐστιν, ὧν τὰ πέρατα ἕν. II. Ἁπτόμενά ἐστιν, ὧν τὰ πέρατα ἅμα. III. Ἐφεξῆς ἐστιν, ὧν μηδὲν μεταξὺ ὁμογενές. All translations from this treatise are mine.

and 'unintermittent'.[2] Below are the propositions of the theorems only, without following proofs:

1.1. Two indivisibles (ἀμερῆ) do not touch (ἅψεται) each other.
1.2. Two indivisibles form nothing continuous (συνεχές).
1.3. That what is adjacent between two indivisibles in a continuum (ἐν συνεχεῖ), is continuous (συνεχές).
1.4. [Any of] two indivisibles cannot be adjacent (ἐφεξῆς) to another.
1.5. All continuous [objects] can be divided into [parts, which are] always divisible (εἰς ἀεὶ διαιρετά).[3]

The most obvious examples of indivisibles and continuous are mathematical points and a line segment. Indeed, a segment is limited by two points, being a continuous object between two indivisibles (theorem 1.3), which do not touch each other directly (theorem 1.1). A segment can be divided into parts an unlimited number of times (theorem 1.5), but each division requires a point at which a division occurs — without specifying such a point, the divided parts are undefined, and division is impossible (theorem 1.4). Similarly, two points themselves cannot produce a segment unless they are placed in a continuum, at least one-dimensional (theorem 1.2). Finally, Proclus gives an explicit identification of a point with the indivisible in his *In Euclidis elementorum*, while the spatial extension he calls divisible.[4]

Consequently, points can be posited independently outside a continuum, but no definite continuous object can be considered without a point or a set of points. Here we should remember that Euclidian geometry tried to avoid unlimited objects such as lines or planes, considering primarily segments and surfaces instead. In the prologue to the commentary on the first book of Euclid's *Elements*, Proclus emphasises that capability to manage infinite, irrational and inexpressible entities is a feature that is "thought to distinguish geometry from arithmetic".[5]

Obviously, in the Aristotelian context, both a point and a segment

[2] LSJ: 1714.

[3] Procl. *Inst. phys.* 1, 2.12–4.19.

[4] Procl. *In Euc.* 95.19–20 Friedlein: ἔχει καὶ τὸ σημεῖον ἀμερῶς καὶ τὰ διαστήματα μεριστῶς.

[5] Procl. *In Euc.* 6.19–22. English translation: Morrow 1992: 5.

are entities of the same geometrical nature, there is no substantial difference between them — except for the feature that is called dimensionality in modern terms.

On the other hand, following Platonic tradition, the principal features of a point — i.e. being indivisible, simple, containing no parts, having neither spatial nor temporal extension, and also no shape, form, centre, periphery or border — all these features make it very close to the descriptions of intelligible entities. Similarly, extensive, unlimitedly dividable, having no internal limit characters of the continuous makes it similar to material objects or even to the primary matter itself. Implicitly, the language which Aristoteles uses to describe the indivisible and the continuous, is highly appropriate to describe the distinction between the intelligible and material in the Platonic sense. Therefore, from the Platonic standpoint, indivisible and continuous are separated by a fundamental ontological barrier.

2. Metaphysical usage of Aristotelian terms

In the commentary on Plato's *Timaeus*, Proclus expands the concept of συνεχής. Following the translation of David Runia and Michael Share, now it is the matter of an object's capability "to hold itself together", which is proper to intelligibles and is absent in the sensible realm:

> But if real Being subsists of itself (παρ' ἑαυτοῦ ὑφέστηκε) as ungenerated, that which does not subsist of itself would not be really ungenerated, and if that which is really indestructible (ἀνώλεθρον) is by nature able to hold itself together (συνέχειν), [then] that which is unable by nature to hold itself together (μὴ πεφυκὸς ἑαυτὸ συνέχειν) is not really indestructible. ⟨…⟩ Every such entity that brings itself forth or holds itself together is without parts (ἀμερές).[6]

The following discussion considers the heaven in its bodily form (σωματοειδές) and concludes that it is neither ungenerated nor is able "to hold itself together". Elsewhere, Proclus several times repeats that

[6] Procl. *In Ti.* 1.252.28–253.5 Diehl. English translation: Runia, Share 2008: 97.

"everything that holds together (τὸ συνεκτικὸν, τὸ συνέχον) is indivisible (ἀμερές)"[7] and therefore is incorporeal and indestructible. Bodily objects are described with all the opposite qualities, respectively. When speaking of the heavenly bodies, Proclus insists that their souls "sustain and move (συνέχουσαν ⟨…⟩ καὶ κινοῦσαν)" their bodies.[8]

In other words, συνέχειν may mean either the spatial extension of a material body or an immaterial capability of the intelligibles to spread over some entity and sustain its autonomous being — either corporeal or not. More generally, συνέχειν does not always imply continuity or extension, but always refers to keeping some entity in itself, a kind of self-identity. From the geometrical standpoint, an entity is called συνεχής when it is spatially extensive and is held in itself by some sustaining principle. In Proclean terms, anything continuous is limited, hold and sustained by the indivisible. Moreover, when the term συνεχής is applied to corporeal continuous entities, they are divisible, and when to the intelligible ones — they are indivisible. This simple formula facilitates distinguishing in which sense συνέχειν is used by Proclus.

3. Bridging the gap between geometry and metaphysics 'downwards'

However, the dual sense of συνέχειν discovers an opportunity to bridge its geometrical (i.e. 'Aristotelian') and metaphysical ('Platonic') contexts. Two other fragments of *In Timaeum* clarify this subject:

> While the one [body] has been divided in relation to those things which are extended, the other [soul] has been established within itself (ἐφ' ἑαυτῆς ἱδρυμένη) and is itself present everywhere in an indivisible manner (ἀμερίστως) and sustains (συνέχουσα) the divisible life by its own indivisible powers. But if it is necessary to speak about the World Soul in a manner that is worthy [of the subject], the interweaving of the body in relation to the soul is a unification without mixture and an association and sustaining of life (κοινωνία ζωῆς καὶ συνέχεια καὶ ζῳογονία).[9]

[7] Procl. *In Ti.* 1.293.28–294.3. English translation: Runia, Share 2008: 147.
[8] Procl. *In Ti.* 3.71.26–72.2. English translation: Baltzly 2013: 142.
[9] Procl. *In Ti.* 2.285.29–286.1. English translation: Baltzly 2009: 279–280.

It is important that an immaterial soul extends over the material body in an incorporeal manner, her powers are called indivisible (ἀμερίστοις ἑαυτῆς δυνάμεσι), and all her activity stays unified, whole and simple as opposite to the multiplicity, division in parts and consequent complexity of corporeal bodies. Bodies are spatially extended and therefore can be called συνεχής — and this concept of extension *per se* is already a common point between the intellectual and sensual.

Another piece of *In Timaeum* explains the extension of gods' indivisible powers over the material elements:

> And Phorcys indeed, ⟨…⟩ presides over the whole of a humid essence (τῆς ὑγρᾶς ὅλης οὐσίας), containing all of it impartibly (ἀμερίστως συνέχων). But Rhea is a divinity connective (συνεκτική) of flowing and aerial-formed spirits (ἀεροειδῶν πνευμάτων).[10]

While the previous fragment described the spreading of intellectual powers over particular bodies, this one takes into account the elements regardless of bodily forms, e.g., the humid substance as a whole. The 'spirits' is a translation of more ambiguous Greek πνεύματα, which may stand here either for some kind of invisible (but not necessarily immaterial) beings or for blowing winds: both readings are consistent with the surrounding context. In any case, συνέχειν, either as 'spreading', 'containing', or 'sustaining', reveals a mode of interaction between the intelligible and material that is related to holding an entity (either intellectual or material) within certain limits — either geometrical or logical (eidetic). Material entities are always contained by anything different from them, being indivisible as opposite to their divisible nature and confining them either spatially or logically. Immaterial entities are always self-confined, being immaterial and confined in an eidetic sense only.

Now, we can return to συνεχής as spatial extension. Proclus provides several clues on how a divisible continuum is 'held together' by intellectual entities. The first passage is located in the *In Timaeum* as well:

[10] Procl. *In Ti.* 3.187.27–29. English translation: Taylor 1820: 326–327.

> In general, if the Intellect is cause of the unlimited and unwearying and single motion, there exists an entity which is the efficient cause of that which is everlasting. If this is the case, what prevents the cosmos from being both everlasting and derived from the paternal cause? ⟨…⟩ The alternative, then, is that the cosmos does not have a power at all through which it is held together (οὐκ ἔχει δύναμιν ὅλως, δι' ἣν συνέχεται). But how could this be? After all, every divisible entity has something indivisible which holds it together (τι ἀμερὲς τὸ συνέχον αὐτό), as he himself [Aristotle] says somewhere, and the universe is a living thing (he at any rate says that the god is an 'everlasting living thing'). Now every living thing is held together by the life present in it (ὑπὸ τῆς ἐν αὐτῷ συνέχεται ζωῆς).[11]

The following discussion argues that the cosmos as a living entity has either a power to hold it together from itself, or such power is unlimited and therefore should be obtained from anything another, "not from itself". Proclus selects the least alternative: "it is another entity, therefore, which will give it its power of existence"[12] and which, of course, belongs to the intelligible realm.

However, among the statements on the nature of the cosmos, there is a more general assertion: every divisible entity has something indivisible which holds it together. If the entity which holds together the whole cosmos is different from itself and has an intelligible nature, therefore, any other particular corporeal entities should also be 'held in themselves' by something other, indivisible and non-continuous.

In the commentary on Plato's *Parmenides*, Proclus explicitly speaks of this 'other' to have an eidetic nature:

> The divisible and dispersible quality (τὸ μεριστὸν καὶ τὸ σκεδαστόν) of bodies, after all, is compressed (σφίγγεται) and held together (συνέχεται) by no other agency than the indivisible power of the Forms (τῶν εἰδῶν); in and of itself, body is prone to division (διαιρετὸν), and it requires the cohesive force (συνεκτικῆς) of the reason-principles (τῶν λόγων). And if it is the case that unity is the prior condition of this cohesion (συνοχῆς) (for everything that causes cohesion in others should itself first be one and indivisible (ἀδιαίρετον)), the Form would then

[11] Procl. *In Ti.* 1.267.16–28. English translation: Runia, Share 2008: 115.
[12] Procl. *In Ti.* 1.268.2–3. English translation: Runia, Share 2008: 115.

> be not only generative, as we said, and conservative and perfective, but also cohesive and unificatory (συνεκτικὸν καὶ ἑνωτικὸν) of all secondary entities.[13]

Proclus' wording here seems somehow contradictive: above, we have seen that being continuous is a property of divisible entities; a continuous entity can be divided an unlimited number of times. On the other hand, the least quotation states that 'cohesive force' is what makes a body 'compressed', 'held together' and, after all, unified to some degree. However, Proclean dialectics meets no obstacles here: in each division, every new part is again a continuum and again is unified in itself. This continual unity paradoxically combines unlimited divisibility with formal unity. Actually, being divided into parts, each part can exist only if it has its own form, which is shaped according to some intelligible entity, i.e. its proper *eidos* and *logos*.

4. Bridging the gap between geometry and metaphysics 'upwards'

According to the passages quoted above, there is a common regularity: the descent from the intelligible to the material is accompanied by the transition from indivisibility to division, from unity to multiplicity, and from singularity to extension. However, Proclus considers also the opposite direction, when extension gets contracted into a point, and which he connects with the concept of *smallness*:

> As we said that Greatness (τὸ μέγεθος) is the cause of excess, or superior worth, or preeminent power alike in all things that are, and that Equality is the parent of all analogy and parity of rank, so also we may say that Smallness (τὸ σμικρόν) is the source of all declension among the Forms, and, if you like, of indivisibility (ἀμερείας) and contraction (συνοχῆς) and power of self-concentration (εἰς αὐτὸ συννευούσης) wherever it exists. It is Smallness that enables souls to retreat from externals to the indivisible form of inner life (ἐπὶ τὸ ἀμέριστον εἶδος τῆς ζωῆς), and bodies to be constricted (σφίγγεται) and held together (σφίγγεται) by the partless (ἀμερέσιν) causes within them,

[13] Procl. *In Prm.* 909.18–29 Cousin. English translation: Morrow, Dillon 1987: 267–268.

> and the entire cosmos to be a unity and have its whole life converging (συννεύουσαν) upon a single center. From Smallness also come poles and centres, sections without thickness (ἀμερεῖς τομαὶ), the tangent points of cycles, the boundaries of the signs of the Zodiac, and all the indivisible measuring points that the demiurgic Intellect has fixed in the divisible world. Such is the power of Smallness (αὐτοσμικρότης).[14]

This Smallness causes centripetal movement either in the spatial or logical sense: for intelligibles, it causes unification and reversal from periphery to centre; for corporeals, it contracts the continuous extension into singular points, and converts divisible entities into indivisible ones. Geometrically, the smallness is related to the structure of objects and the cosmos as a whole: its 'poles', 'centres', 'sections' and 'tangent points of cycles' are the limits, between which all the continuous entities are extended — according to the theorem 1.3 of the *Institutio physica*. Moreover, if the *greatness* is the opposite of the *smallness*, then there should be a way of contraction that brings us from unlimitedly divisible extension to singular points organised in a strict structure of the cosmos, and the opposite way of expansion from these structural points to fill the spatial extension between them. It is very close to the conception of forms shaping the matter except that here is purely geometrical and structural scope, without any other physical properties (and the most important quality omitted here is the heaviness or gravity, ὀγκος[15]).

From the standpoint of analogy between ontology and geometry, it is important to take into account one term more, the infinite. In the *Platonic theology*, Proclus writes:

> Nevertheless, eternity is more characterized by infinity [than by limit] ⟨…⟩ For it is a henade (ἑνάς) and power (δύναμις). And as a henade, it is a limit (πέρας), but as a power, it is infinite (κατὰ τὴν δύναμιν ἄπειρος). Through the images, [Plato] shows that the middle triad [of intelligibles] has limit, infinity, and that which is mixed [of them both]. For whence could the limit of time be derived except from the limit of

[14] Proc. *In Prm.* 871.8–28. English translation: Morrow, Dillon 1987: 235.

[15] Cf. Plotinus' discussion in *Enn.* 2.4.11. Note his emphasis on the difference between the One and ὄγκος σφαίρας, which Parmenides (28 B 3, B 8 DK) identified with the being (*Enn.* 6.5.11.5–11).

> eternity? For the temporal limit also is indivisible (ἀμερές), because the limit of eternity is a henad. For the indivisible is the image of the One (τοῦ ἑνὸς εἰκών). Whence is the infinity of the temporal continuity (τὸ ἄπειρον τῆς συνεχείας) could be derived except from the power of the infinite (τῆς ἀπείρου δυνάμεως)?[16]

Here is the relatively rare instance, when Proclus speaks about temporal continuity, not spatial one. It appears to be possible to describe the infinite in the same terms, which are used to describe the infinite potentiality of the intelligible eternity. The temporal continuum is simultaneously limited and infinite, and therefore, participating in both, is ordered by measure and number.

Another important conclusion is that it is possible to ascribe infinite qualities to the intelligibles with the same terms as the material bodies. Moreover, the higher level of the intelligible realm we consider, the more unlimited it can be:

> Prop. 95: *The more unified potency is always more infinite than one which is passing into plurality.*
> For if the first Infinity (ἀπειρία) is nearest to the One, then of two potencies that which is more akin to the One is infinite in a greater degree than that which falls away from it; since a potency as it becomes manifold loses that likeness to the One which caused it while it abode therein to transcend the rest, concentrated in indivisibility (συνεχομένη διὰ τὴν ἀμέρειαν). For even in things subject to division potencies are multiplied by co-ordination, enfeebled by partition.[17]

Now the semantics of συνέχειν reaches its highest level of applicability: the close to the One is an intelligible entity, the more is it indivisible, more infinite and, consequently, better 'holds itself'. This capability of being self-concentrated, immutable and unlimited accompanies the urge to the uniform, simple and unparted being (or beyond being, when speaking about the One).

In another passage, describing the way to intelligible perfection, Proclus splits it up into three stages. The first one is associated with

[16] Procl. *Theol. Plat.* 3.60.1–8 Saffrey, Westerink. English translation: Taylor 1995: 208–209 with my changes.

[17] Procl. *Inst.* 95 with English translation: Dodds 1963: 84–85.

the perfecting of every part of a given immaterial entity. The second is the transition from divisibility into an indivisible state and its subject is called συνεχόμενον. The third stage provides the ascend to the One through final unification.[18]

5. Conclusion

There is no doubt that the analogy between mathematical and metaphysical understanding of συνεχής is not perfect. There are certain discrepancies between the spatial (and temporal) continuum, the non-extensive spreading of intelligibles over corporeal bodies, and their capability to 'hold themselves'. And these discrepancies cannot be removed by the means of pure dialectics. Fewer problems are with the similar analogy when speaking about the indivisible, ἀμερής, however, the absolute correspondence between a geometrical point and an intelligible entity, of course, is also unattainable. However, the full analogy is not our aim here, nor that of Proclus.

Like with other terms and categories, it is more promising to seek symbolical relation instead of direct analogy. And from this standpoint, our results are more meaningful. Indeed, we can appreciate the material continuity as a symbolic representation of intelligible capability of self-concentration, immutability and rest, while the properties of a mathematical point are a representation of the intelligible indivisibility, simplicity and unity. And in such a case, the mathematical objects illustrate how intelligible entities interact with each other, and how their properties are mutably harmonised. Moreover, if we take their symbolic meaning in a theurgical sense, geometry may become even a starting point for one's intellect to ascent into the intelligible realm (however, this type of symbol should not be as effective as corporeal objects due to its high level of abstraction[19]).

Another important consequence is that Proclus can demonstrate how geometry is derived from higher metaphysical principles and

[18] Procl. *Theol. Plat.* 4.57.25–58.8.

[19] Cf. Chlup 2012: 88–92.

therefore give a precise location in his ontological hierarchy. It appears similar to other sciences and arts, which were systematised by Neoplatonists into the uniform scene of universal knowledge.[20]

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[20] For further details on the Proclean harmonisation of Platonic metaphysics with Aristotelian physics, see: Siorvanes 1996: 207–256.