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THE CONCEPT OF NATURE

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The concept of Nature –

From pre-Socratic *physis* to the natural κόσμος of the *Timaeus*

INTRODUCTION:

I will begin my attempt to rediscover a concept of ‘Nature’ that is neither mathematical nor the sum of all things that self-generate with a description of the understanding of ‘*physis*’ as a *concept of being*, by pointing out that it was used to describe reality as a living and organically developing whole. Furthermore I will show how this conception of reality implies a monistic unity of intelligible and essential as well as material aspects. I will then look at the developments that have ultimately lead to more the familiar understanding of Nature as mathematically describable or self-generating matter as well as the essence of something: In Eleatic thought on the one hand ‘*physis*’ slowly lost the status of a *concept of being* and became associated with mere materiality. In sophistic-scientific thought, on the other hand, the term came to denote only the essence or nature of something.

With these developments around 500 BCE the unity of reality as *physis* was thus slowly divided so that the term ‘*physis*’, not denoting the whole of reality anymore, could now be used to refer to either aspect: changing materiality or stable essence. Finally I will take a quick look at the conception of reality in Plato’s *Timaeus*. Through a reintegration of the static intelligible and the dynamic material aspects in this dialogue Plato was able to propose a new view of reality that breached the Eleatic rift between the intelligible and the physical by describing a ‘*natural κόσμος*’.

1 THE PRE-SOCRATIC ΦΥΣΙΣ – NATURE BETWEEN BEING AND BECOMING

When the earliest poets, scientists and thinkers looked at the world they saw one living organism: “The insight that the world is a system, is organic, therefore both orderly and alive, is the Greek view as far back as we have records.” (Cairns, 1961: xvii)¹ This world was

¹There are many contributions on the roots of the concept of ‘*physis*’ in Greek theology. One excellent if older example is Heidel (1910: 82ff), who claims that the λόγος περι φύσεως succeeds the μῦθος περι θεῶν in a natural transition. (idem: 89)

characterized by materiality, growth and life. “This conception was to the Greeks so obvious that the fact of natural growth lay at the foundation of their thought. Growth implies life, and life implies motion. This is true of Greek thought always.” (Heidel, 1910: 98) In the *Physics* Aristotle emphasises that the older thinker of physis (οἱ πλεῖστοι πλεῖστοι τῶν φυσιολόγων, Phys. 203b10) did not perceive the need to distinguish between a material cause and the cause for movement: “For the Monists [the φυσιολόγοι], as the word implies, one *archē* was sufficient to fulfil the two roles. They believed that matter was literally alive, whence the expression, “hylozoism” to qualify this doctrine.” (Naddaf, 2005: 66)

This ancient concept of the world as physical and alive, as self-generating and self-ordering is expressed by the term ‘physis’. But this term, as so many central concepts in ancient Greek philosophy, is faceted and conveys many overlapping meanings that developed and changed through time. The term ‘physis’² in its early use mainly refers a) to growing and becoming life³, b) to origin or birth⁴ and c) to nature (as the nature of something in contrast to the accidental properties)⁵. In later times the term ‘physis’ has also been used to refer d) to the material substrate of the world, and e) to Nature (as the sum of all beings that self-generate).⁶ The term ‘physis’ as it was used in the times of Homer and Hesiod is fundamentally ambivalent and oscillated between ‘becoming’ and ‘being’. This ambivalence can be traced back to the Indo-Germanic roots of ‘physis’: ‘*bheu’ was also used to refer to both ‘growth’ as well as ‘being’.⁷ Just as the term ‘*bheu’ was used to describe the process of becoming⁸ as

² For a quite exhaustive list of the possible meanings of physis from the pre-Socratics until Aristotle see Heidel, 1910: 97.

³ Physis as γένεσις.

⁴ Physis as the beginning of a process – an aspect leading to the understanding of physis as material substrate (causa materialis).

⁵ Physis understood as that which Aristotle will consider a final cause or efficient cause. In this sense ‘physis’ refers to the being of something, to its essence. Here some connection of becoming nature with intelligibility and essential structures is still evident.

⁶ For example Bremer, 1989: 242. Even though Aristotle’s investigation is not concerned with the φύσις τῶν ὄντων anymore, but the physis as such, he still insists that only a concrete hypokeimenon can have a nature (Phys. 192b34). See also Mannsperger, 1969: 11. Our more abstract understanding of Nature as a term that refers to the sum of self-generating beings is a rather late development.

⁷ For an etymological investigation of this root see Mannsperger, 1969: 38.

⁸ See for example Heidel, 1910: 96; Diller, 1939: 242; Heinimann, 1945: 94 or Kahn, 1960: 201.

well as the effect of stability that results from this process of becoming⁹, ‘*physis*’ was not only used to refer to growth and the process of becoming¹⁰, but also to refer to the stability within the process, the nature (the essence or the being) of that which is growing.¹¹ The earliest known use of the term therefore combines two aspects, namely *physis* as (a) the process of becoming and as (b) the nature (or later essence) of something.¹² Accordingly the meaning of ‘*physis*’ in *ancient thinking* is probably translated best as *becoming being* (i.e. *becoming nature*).

To clarify and support the claim that ‘*physis*’ was used to refer to *becoming nature* I will look at the earliest known use of ‘*physis*’ in Homer’s *Odyssey*, where the term is used once to characterize a herb:

Saying this, Argeiphontes gave me the herb, which he had unearthed and showed me its *physis*: the root was black, but the flower was like a kind of milk (Homer, *Odyssey*: X. 302)

The first thing to note about this passage is that it suggests that the *physis* of something can be pointed out or shown. But in order to show the *physis* of the herb, it has to be unearthed, so that the whole growth of the plant is visible. The blossom alone cannot show us its true nature. Only the entire plant considered as a becoming living structure – considered as a whole, from its roots in the past to its present bloom – displays how the plant has ‘become’ and what *physis* it possesses.¹³ What this plant is now, its present nature and therefore its essential and accidental properties are the result of its becoming.

In Homer, *physis* designates the whole process of growth of a thing from its birth to its maturity. This is compatible with a linguistic analysis of the word *physis* which shows that the fundamental and etymological meaning of the term is that of “growth,” and that, as an

⁹ See for example Kirk, 1962: 228 or Vlastos, 1975: 19.

¹⁰ An aspect emphasized by its root φύειν/φύεσθαι.

¹¹ See Mannsperger, 1969: 41 and especially 45-52.

¹² The term ‘*physis*’ as the essence or nature of something in earliest thought only applies to concrete material things. But the character of these concrete things on which the term ‘*physis*’ can be applied to also evolves from concrete beings or groups in earlier thought (f.e. Gorgias, DK 82B11a or Aischylos, Prom. 488-490) to the world as a whole like in Plato’s *Meno* (81c5-d5) or Nature as a whole in Aristotle’s *Metaphysics* (1005a31). Therefore Aristotle can still claim that, καὶ ἐν ὑποκειμένῳ ἐστὶν ἡ φύσις αἰεὶ (Phys. 192b34), even though he sometimes uses the term ‘*physis*’ to refer to Nature as a whole.

¹³ See Bremer, 1989: 243.

action noun ending in –sis, it means “the (completed) realization of a becoming” – that is to say, “the nature of a thing as it is realized, with all its properites.” (Naddaf, 2005: 34)

So in Homer the term ‘physis’ did not refer to some substantial or timeless core behind a moving and changing reality, nor did it refer to some abstract ideal shaping changing reality – it was an inseparable part of growing and becoming nature.¹⁴ ‘Physis’ was not only used to refer to the *becoming nature* of plants, but to the *becoming nature* of beings in general. So the nature or essence of every being (φύσις τῶν ὄντων) could be considered a result of its becoming.¹⁵

2 THE UNITY OF REALITY: ΦΥΣΙΣ AS A CONCEPT OF BEING

Even though the term ‘physis’ does not play a prominent role in the early Ionian writings, [...] the vast majority of commentators, both ancient and modern, concur that the primary goal of written pre-Socratic works was to provide a *historia peri phuseōs*, an investigation into the nature of things. In conjunction with this, pre-Socratics, beginning with the early Ionians, took “all things” (*ta panta*) or “the universe” (*ta pan* or *to holon*) as their primary object of study. In the expression *historia peri phuseōs*, it is this comprehensive sense that must be understood by the word *physis*. (Naddaf, 2005: 64)

The term ‘physis’ can thus be considered a central concept in pre-Socratic thought, used to elucidate the nature of *all reality*, not merely the physical cosmos or the sum of what creates itself. We can deduce the importance of this concept mostly from the way later thinkers refer to the pre-Socratics and their use of the expression. Aristotle talks about the ‘φυσικοί’ (Phys. 184b15-19, or Met. 1026a4-6), and the ‘φυσιολόγοι’ (Met. 986b14, 989b30-1, 992b4-6) when talking about the pre-Socratics. A further indication for the central role of ‘physis’ is that most

¹⁴ See Bremer, 1989: 242. Furthermore Diller, 1939: 242, as well as W. Schadewaldt, 1960: 908.

¹⁵ This use of the term ‘physis’ as referring to the process of becoming as well as to the result of this process is not as rare as some authors, like for example Burnet or Ross, have claimed. In response to this W.A. Heidel claims that “Greek philosophy did, indeed, seek the permanent amid the flowing; but, as the first determined effort of the human mind to frame a science, it sought an explanation of the fleeting phenomena. This explanation it found ultimately in that which abides, and gave to it various names: but it was not the permanence, but the causality, of the ὑποκείμενον to which, as scientists, the Greek philosophers devoted their chief attention.” (1910: 82) This leads him to defend a much more dynamic concept of ‘physis’, at least in earliest Greek philosophy. See also Clay, 1996: 33.

of the early writings were handed down with the title ‘Περὶ φύσεως’¹⁶. Even if these titles in all likelihood were not chosen by the authors themselves, but attached to these works in later times, they still give an indication as to how deeply the work of the earlier thinkers was connected with this concept. But the title ‘*On nature*’ (περὶ φύσεως) does not merely imply a study of physical nature, but a general investigation into the nature of things (φύσις τῶν ὄντων):

Physis is, of course, the catchword for the new philosophy. [...] The early philosophers sought to understand the ‘nature’ of a thing by discovering from what source and in what way it has come to be what it is. This was as true for the detailed study of man and of living things, as for the general theory of the world as a whole. [...] Hence it is that physis can denote the true nature of a thing, while maintaining its etymological sense of ‘the primary source or process’ from which the thing has come to be. ‘Nature’ and ‘origin’ are combined in one and the same idea. (Kahn, 1960: 201)

Physis does not refer to inert matter or for the material principle out of which the world was generated, but it also refers to *becoming nature* and thus to the becoming essence of world, which also includes man and his relation to the world. The concept of ‘physis’ is thus not restricted to cosmological matters, but it has implications on epistemological, metaphysical and anthropological questions.

A number of texts strongly suggest that the *phusis* of “all there is” refers not only to what we call cosmology, but also to the origins and development of human beings and their social organisations and politics. In the final analysis, this may very well be the general meaning of the expression *historia peri phuseōs*. (Naddaf, 2005: 35)

The kind of being referred to through ‘physis’ is not an unchanging, ideal or abstract entity that hides behind moving nature. This kind of being is an integral part of changing and becoming reality. As such ‘physis’ does not only refer to the becoming existence of organic nature, it conveys the *becoming nature* of every being. While it is true that this connection between ‘physis’ and (μὴ) ὄντος is not very common, there are some references to their identification in the titles of pre-Socratic writings (with reference to Melissus and Gorgias).¹⁷

¹⁶ Other titles given to the works of the pre-Socratics were πάντα (alles) and περὶ τῶν μετρώρων (on the things in the heavens, which was often used with the added ‘and underneath the earth’). For a thorough investigation into the role of the ‘περὶ φύσεως’ title, see Schmalzriedt: 1970.

¹⁷ See DK 30 A 4 (Simplikios, De caelo 557,10, in Phys. 70,16) or DK 82 B 3 (Sextus Empiricus, Adv. math. 7,65).

Another way to conceive ‘physis’ as a concept of being is to claim that the nature of every single being (physis τῶν ὄντων) is the result of its becoming and thus the early περὶ φύσεως should also be understood as metaphysical περὶ πάντων, since there is more evidence for the connection between περὶ φύσεως and περὶ πάντων, than for the connection between ‘physis’ and ‘ὄντος’. (For example Heraclitus, DK 22B1, or Aristotle Met. 988b27.) Who spoke about περὶ φύσεως did not only speak about physical nature, but about everything.¹⁸ This means that ultimately the “Gegenstand der vorsokratischen Theorien [...] ist buchstäblich “alles”, nicht die “Natur”. Der Naturbegriff bezeichnet keinen Gegenstand, sondern eine charakteristische Fragestellung, der eine charakteristische Methode der Beschreibung und Erklärung entspricht.” (Heinemann, 2001: 247). *Thus physis thus should be understood as a concept of being, a concept that refers first and foremost to the kind of being things have and therefore a concept far more analogous to εἶδος and οὐσία than to matter, nature or κόσμος.*

3 THE DIVISION OF REALITY: ΦΥΣΙΣ AS EITHER ESSENCE OR MATTER

With Eleatic thought on one hand and with the emerging natural sciences on the other a shift happened in the Greek conception of reality. At this point I want to emphasise that in referring to these developments I am merely concerned with the general interpretation of these thinkers and I am making no claims as to the adequacy of these interpretations. Thus for example in what follows I do not intend to claim that Parmenides was the thinker of static being, but I am merely referring to the way he was generally interpreted and how his thought influenced later thinkers.

Parmenides as well as Empedocles are usually considered thinkers that reduced ‘physis’ to the aspect of material becoming and physical reality. There is some textual basis for this reading – depending on the interpretation this reduction is at least implicitly present in Parmenides’

¹⁸There are arguments against the theses, that the investigation into nature is related to an investigation of the whole of existence. Consider for example Aristotle, De part. Anim. 641a36-b1. Here he argues that the rational aspects of the soul cause no movement and therefore possess no physis. But the way Aristotle argues this point implies that the connection between an investigation περὶ φύσεως and περὶ πάντων must have had some influence, so much so, that it became necessary to argue explicitly against this idea.

thought¹⁹, Empedocles on the other hand makes it explicit.²⁰ Thus within Eleatic thought, as it is usually interpreted, ‘φύσις’ is merely a general name for becoming and thus belongs to the realm of δόξα. But however we are to interpret the didactic poems by Parmenides and Empedocles, it is undeniable that these works were received in a certain way, which informed later philosophy substantially.

The distinguishing marks of the Eleatic influence is most pronounced on the level of logic, where the Eleatic tradition inspired logic as an ideal form for thought, which is precise and free of ambivalence or contradictions. On the cosmological level there is an influence leading to the strict separation of stable *true reality* from changing *apparent reality*. This is a separation of the world *as it can be experienced* and the world *as it can be thought without contradictions*. The influence of Eleatic thought within the realm of logic and of cosmology lead to a disengagement between what was considered intelligible true reality and the world of mere appearance, which is physical and can be an object of experience.

But at the same time within sophistic and scientific thought, the term ‘φύσις’ developed in a rather different direction. In the sophistic and scientific thinkers there seems to be an opposing tendency to reduce ‘physis’ to its essential aspect. While the sophists took ‘physis’ to denote the true essence of being and distinguished from its aspect of becoming,²¹ in the emerging

¹⁹ A strong indication is the fact that the term is used only in the second half of the poem, concerned with the illusions mankind considers real. F. Heinemann argues that to understand the role of physis in Parmenides’ thought it suffices to read DK 28B10 and DK 28B19 together (Heinemann, 1945: 89) In DK 28B10 the Goddess does not only attempt to explain the ether, the sun, the moon and the heavens, but also their becoming, which is referred to with the term ‘physis’. Taking furthermore DK 28B19 in consideration (Οὕτω τοι κατὰ δόξαν ἔφυ τάδε καὶ νυν ἔασι καὶ μετέπειτ’ ἀπὸ τοῦδε τελευτήσουσι τραφέντα· τοῖς δ’ ὄνομ’ ἄνθρωποι κατέθεντ’ ἐπίσημον ἑκάστῳ.) F. Heinemann argues that the connection between naming and change become clear – processes of change become more real when given a name.

²⁰ In DK 31B8 Empedokles writes: ἄλλο δὲ τοι ἔρέω· φύσις οὐδενός ἐστιν ἀπάντων θνητῶν, οὐδέ τις οὐλομένου θανάτοιο τελευτή, ἀλλὰ μόνον μίξις τε διάλλαξις τε μινέντων ἐστί, φύσις δ’ ἐπὶ τοῖς ὀνομάζεται ἀνθρώποισιν. (I will tell you another thing: There is no becoming (φύσις) of mortal things, or an End in inauspicious death; but merely mixture and changes of this mixture. Becoming (φύσις) is just a name for these things introduced by humans.

²¹ See Heinemann, 1945: 95 and 106.

sciences, *physis* is mostly used to refer to the ‘usual’ or ‘normal’ state of affairs.²² Both sophistic and scientific thinkers generally considered *physis* not as the concept of being of pre-Socratic thought, or as the moving counterpart to intelligible being (ἐόν) as in the Eleatic tradition, but as the naturally existing in opposition to what is given or created by normative laws (νόμος), human or divine.

“Von Parmenides’ Physisbegriff führt also kein Weg zur ‘sophistischen’ φύσις, welche das wahre Wesen, welche das von allen sekundären, besonders menschlichen Zutaten unbeeinflusste So-Sein der Dinge bezeichnet.” (Heinimann, 1945: 92) So with the development of scientific, sophistic, Eleatic and Socratic philosophy we see the first attempts to overcome the etymologically grounded ambivalence of the term ‘*physis*’ through a division, which over time led to a separation of the antithetical aspects formerly united in the ancient concept of ‘*physis*’. What therefore connects Eleatic and the scientific-sophistic thinkers is the attempt to strictly separate being and becoming in the concept of ‘φύσις’. In both traditions there is no room for the more ambivalent concept of φύσις as *becoming nature*.²³ This led to the strange result that the term ‘*physis*’ could now be used to refer either to materiality and unintelligible change, or to essential determination and natural order. Thus the concept of ‘*physis*’ as *becoming nature* was divided into *unintelligible (becoming) materiality* and the *nature (essence) of something*.

4 THE RE-INTEGRATION: PLATO’S *TIMAEUS* OR THE GENERATION OF A NATURAL ΚΟΣΜΟΣ

One consequence of these divisions is that ‘*physis*’ could either be used synonymously with ὕλη to refer to a “permanent ground” (Cornford, 1957: 178), the passive, unordered and

²² Herodot 2,38 (here κατὰ φύσιν is used in this sense), Herod. 4,50,2 or 5,118,2. After about 400 BCE this use can be also found in medical writings. See Heinimann, 1945: 97f.

²³ The reasons behind these developments are unclear. One reason for the degradation of ‘*physis*’ in Eleatic thought might be that ambivalent concepts like ‘*physis*’ do not lend themselves to rigorous logical manipulation in the Eleatic style. Furthermore the concept of becoming nature cannot lead to an objective foundation for knowledge, because becoming nature merely implements an evolving and changing natural order and not an unchanging intelligible system. This might be the reason ‘*physis*’ played a central role in sophistic thought.

inanimate material fundament of reality.²⁴ So that it could be “conceived [of] as the ultimate [...] stuff out of which the world grew”. (Cornford, 1957: 124) Or ‘physis’ could be used to talk about the timeless essence, the nature or substance of something. These essential aspects were then associated with abstract entities and the immaterial and unchanging kind of being attributed to the ideas or substances. With these developments a dichotomy between being and becoming, between nature and law, between material and essential was opened up that led to the split of the formerly unified ‘physis’ as a *concept of being*.

Interestingly in the *Timaeus*, which is precisely an investigation into the *becoming nature* of the cosmos, both aspects are given a separate account, thus preserving the distinction, but these accounts intertwine, thus realising a new form of unification of these aspects. This new integration became necessary since with Plato’s Socrates an emphasis on ethical and political aspects was introduced into the investigation of reality. These ethical and political ideals could neither be founded on changing material beings, nor could objective ethical norms be justified by referring to natural essences that were not subject to normative laws. Thus in the *Timaeus* Plato developed an idea of reality that combined objective norms with a becoming material reality.

4.1 The Dialogue

The *Timaeus* is a twofold account of the construction of the physical world²⁵ by a divine Intellect – the Demiurge (Craftsman). This focus on the concrete physical world and its becoming is quite unique within the platonic corpus.²⁶ But the main difference between pre-Socratic cosmology and the account in the *Timaeus* is that Plato did not only attempt to provide an account of the facts of existence, but at the same time also wanted to provide an explanation for the beauty and order present in the world. Timaeus argues that irrespective of

²⁴ Even if this is not the only use of ‘physis’ in later Greek philosophy, it is a very widespread use of the term.

²⁵ Most interpreters subscribe to this interpretation of the *Timaeus*, see Strange, 1985. But the fact that the world is physical is not presupposed but deduced. Its corporeality is deduced from the fact that the world is a thing that has a becoming. From its corporeality its visibility and tangibility are deduced, from these in turn its composition of fire and earth. See Zeyl, 2000: xxxix.

²⁶ In the other dialogues concrete reality is usually only mentioned as a moving and changing reflection of true reality.

the apparent deficiencies, problems and inharmonious changes that we experience in our lives, the natural world was created in such a way as to embody a knowable and beautiful systematic order: It was created in such a way as to make an objective and stable ethical and political system possible. Timaeus' explanation for this stability, beauty and order hinges on the idea that our world is an imitation of an *ideal* model created by a *beneficent Intelligence*. But not everything within the world is ordered as best as it could possibly be, since the material out of which the κόσμος is fashioned possesses properties that restrict the possibilities for creation. (30a)

This argument leads to the question of existence before the becoming of the κόσμος, thus the question of what exists before existence – which is a rather tricky problem. During the first account of the generation of the κόσμος, Plato only tells us that, what is present before the construction of the cosmos, is visible (ὄρατὸν) and moving chaotically (κινούμενον ἀτάκτως). (30a) Thus it cannot be identified with the chaotically moving but invisible χώρα (50d-51a) that will be introduced in the second account, without very strong arguments. What both the first and the second account do have in common is that before the construction of the cosmos there is something that the Craftsman uses to fashion the κόσμος, even though the characterisation of what there is before the κόσμος varies.

But the properties of the pre-cosmic material do not only guide what the Craftsman can fashion, as a sum these constraints are also the reason why Timaeus has to give a second account of the becoming of κόσμος that deals with the 'Necessity' caused by the pre-cosmic material. "Nevertheless, in his wisdom the Craftsman is for the most part able to turn these constraints to good advantage, to serve in the production of things that are good and beautiful (this is the 'persuasion' of Necessity by Intellect – 48a2-5), although there will be occasions in which intellect must make concessions to Necessity." (e.g. 74e-75d) (see also Zeyl, 2000: xxxiv) And since the world we live in is a result of the mixture of both Necessity and Intellect²⁷ Timaeus needs to give two accounts of the generation of the κόσμος:²⁸ The first

²⁷Before Timaeus begins with his accounts, he introduces a fundamental distinction between the unchanging (the realm of the νοητός τόπος or κόσμος – the intelligible and ordered) which we can know through conceptual considerations (τὸ μὲν δὴ νοήσει μετὰ λόγου – 28a1) and the changing (the realm of the αἰσθήτος – the perceptible and sensual) which we can merely experience and only have opinions of (μετ' αἰσθήσεως ἀλόγου δόξαστόν – 28a2). But even with this distinction in place Timaeus admits that he is still not able to give a full account of the genesis of the natural κόσμος.

account is focused on what has been crafted by the Intellect (47e4), while the second account is focused on the things that have come about by Necessity (47e5).

4.2 The first account – the purposeful and intelligible order of things

The key feature that characterises the concept of *nature* in the *Timaeus* is the fact that nature does not possess the power of self-generation – until the Craftsman provides it. Nature has lost the power to self-create organic order. Before the intervention of the Craftsman, there exists only a chaotically moving pre-cosmic materiality and without the Craftsman there would be no becoming, no animation and thus no life. The Demiurge has to convince a disobedient material to take on the systematic structures and exhibit the harmonious movements considered advantageous by the intellect in order to render the world inhabitable. A *super-natural Craftsman* has to fashion and introduce a soul to animate the world and thus to enable the κόσμος to be a place of life, harmonious movement and growth. This means that only an intelligible order can be the source of life and movement. This way intelligibility is introduced into the concept of nature and it is only thanks to the acts of a ‘practical’ intelligence²⁹ that the cosmos appears to be the self-generating natural organism that we live in. But the platonic κόσμος is not only an intelligently ordered structure, it is also still a *natural* κόσμος. The Demiurge constructs the κόσμος in such a way as to appear as an animated and living organism. (30c-f) The resulting natural κόσμος is a living thing (ζῷον), which is still connected to growth, change and life – but it has been created this way by a super-natural intelligence.

Consequently the natural κόσμος that becomes through the process of construction embodies precisely the properties that had previously been associated with ‘physis’. The earlier thinkers thus were not wrong in describing the world as physis, they just hadn’t realized that this

²⁸Plato does not use the term ‘physis’ anymore when he talks about nature, thus the *Timaeus* is not περί φύσεως in the traditional sense. Instead Plato uses the terms ‘κόσμος’ (28a, 30b, 92c), ‘οὐρανός’ (28b, 31a, 92c) and the concept of a becoming θεός (34a, 92c).

²⁹There has been much speculation on whether the Demiurge, as a Craftsman, should not be associated with practical reason instead of rationality.

constitution was only the result of a process of creation, inspired by an ideal model and executed by a divine Intellect.

Alles bisherige naturforschende Untersuchen der Ioniker und Italiker ist insofern begriffslos und einseitig, als es beim Stoff, seinen Formationen und Prozessen stehengeblieben war. Geist ist jedoch nicht nur Subjekt und Konstrukteur von Naturerkenntnis, sondern von Natur selbst. Die gesamte Anlage des *Timaios* will diese Einsicht fest machen, [...] (Zekl, 1992: XLI).

In the *Timaeus* the natural κόσμος *becomes* an animated organism, structured through intelligent principles. Therefore it embodies both the principles of physis (animation, self-generation) *and* of κόσμος (order, intelligibility). But none of these properties (of animation, self-generation as well as order or intelligibility) are truly self-generated, truly *natural*. All of these properties are introduced and imposed on a chaotic pre-cosmos by a super-natural Craftsman, who conceives of these properties by looking at an ideal model.

4.3 The second account – Necessity

While the distinction between the ideal model and the imitation of the model was sufficient for the first account of the noetic order of the world, for the account of Necessity a third kind (called the ὑποδοχή – receptacle, accommodation or χώρα – space, room) is introduced. Timaeus argues that a new basis is needed in order for him to be able to account for the coming together of the triangles and the shaping of the elements – the third kind. (49e-50a) This third kind is supposed to provide an unchanging ground or room³⁰ for the ‘suchlike’ elemental qualities and their constituents, the triangles, to appear and from which to perish. The concept of the third kind is notoriously difficult and Plato clearly struggled with its description.³¹ Simplifying, the various descriptions offered in the *Timaeus* are usually reduced

³⁰ The receptacle does not change in the process of receiving ‘suchlike’ things, or when they perish.

³¹ He employs two main strategies to elucidate the nature of the third kind. The third kind can be characterized negatively by denying that it can be described through any rational and finite predication, since it has no relation to the fundament of predication, i.e. the ideas, at all, or it can be described positively through images and metaphors. Plato mainly focused on the second strategy and there are four instances of the metaphoric description 48e, 50c, 52a, 52d. There the chora is described as a midwife, as a mother, as the location for

to the following characterisations: The third kind is an invisible and undetermined (50d-51a) material substratum of change (50c) and/or it is the space or room (χώρα – 52a-b) where these changes take place.³² Furthermore the χώρα is also the fundament for the creation of the triangles. They are fashioned out of or in the chaotically moving pre-cosmic ὑποδοχή/χώρα, which is full of and/or is made out of irregular shapes and movements. (52d) Timaeus claims that these irregular movements of the pre-cosmos caused aggregations of material that lead to the accidental formation of ‘traces’ of the elemental kinds.³³ (52d-53b) But only the introduction of intelligibility through proportion and measure, i.e. the introduction of distinctive shapes and numbers by the Demiurge, yielded a material adequate for the construction of the elemental kinds, as we know them. (53a-c)

If the chaotic movements and the order imposed on them through proportion and measure should account for the material aspect of nature, this implies a concept of matter grounded on geometry, caught up in chaotic movements. This fundamentally geometric conception of matter foreshadows the mathematical understanding of Nature fully developed by Galileo and the ‘materialist’ understanding of matter as extended material – inorganic, and inanimate –, which is not moving according to any inherent final cause or inherent law but merely moving mechanically. So for example “[t]he sensible quality of hotness is the quick, cutting action of small, pyramidally shaped fire bodies that affects the sense of touch [...]. (62a)” (Miller, 2003: 92) The geometric shapes and their movements then turn out to be the basis of the sensible qualities that we experience. On the other hand, if the chaotically moving ὑποδοχή is to be considered the material basis of the κόσμος a metaphysical concept of matter emerges that anticipates the prima materia.³⁴ Either way the material basis of becoming and Nature is not characterised by life, self-generation or even just sensible properties but mainly by

change and as space where change can happen. See Gloy, 1986: 81. For a thorough description and analysis of all four metaphors see Miller, 2003.

³² These two readings, as a substrate and as a space, are discussed thoroughly in Zeyl 2000: lxii or in Gloy, 1986: 82. For the question whether these descriptions are identical or not see Gloy, 1986: 83.

³³ It is not clear whether the pre-cosmos was made out of irregular shapes or whether it couldn't be attributed any shape. See Cornford, 1957: 200.

³⁴ With the difference that Plato's χώρα is characterized as a substratum as well as room or space, while the prima materia is “a purely indeterminate substratum underlying all material composition and providing the ultimate potentiality for all material existence”. (Graham, 1987: 475).

metaphysical materiality, geometrically determined forms or entities and their respective movements. So While the Ionian philosophers had considered “the physical processes [...] as the true and only causes of all things (αἴτια τῶν πάντων 46d) [...] due to their properties or ‘powers’ (δυνάμεις) [...]. Plato intends to maintain that they are not original causes of motion and of world-formation.” (Cornfort, 1957: 162)

5 CONCLUSION

It is very interesting that in the *Timaeus* Plato needs to provide two accounts of the becoming of the world, one reflecting on the intelligible aspects and one explaining the material constraints of Necessity – accounting thus for the two aspects that were combined in the understanding of world as physis, as *becoming nature*. In the *Timaeus* the results of the self-generating power of nature, namely the self-creation of life, organic order and purposeful movements tended to be interpreted as a result not of nature but of intellect or nous. Beauty, order and harmonious movements present in nature are not considered to be the result of self-generation anymore, but to be caused by an intellect or a soul endowed with intellect. This opposition of a *natural becoming of order without intelligence* and an *intelligent and purposeful creation of a systematically structured κόσμος* lies at the heart of platonic cosmology. It is expressed very well in the *Sophistes*: the stranger claims that in regards to the genesis of the world we have only two options. Either the world has come to be through the design of a divine intelligence, or via a physis that generates without intelligence, by bringing forth everything through some self-acting cause (Soph. 265c).³⁵ This opposition between a natural spontaneous power generating an organic order³⁶ and the creation of an intelligible and systematically structured κόσμος through design gives raise to the dual cosmological account in the *Timaeus and arguably to the modern forms of understanding Nature either as*

³⁵ A similar account of these matters and the moral and ethical consequences of this understanding of ‘physis’ can be found in *Laws* 888e-890b.

³⁶ One can speak of an ‘organic order’ of physis, since the term ‘physis’ (as well as its Indo-Germanic root) also had some normative aspects: “Schon die indogermanische Wurzel zeigte eine vermittelnde Funktion zwischen Sein und Werden, Einheit und Vielheit, sie konnte die Gesamtheit der Welt wie auch Einzelaspekte daraus bezeichnen, und ein Element des Normativen, der Schönheit und Vollkommenheit machte sich immer wieder bemerkbar.” (Mannsperger, 1969: 285)

the sum of all things that self-generate or the modern mathematical understanding of Nature born with Galileo dominant to this day. With this paper I hope to have shown a different but still viable way of thinking about Nature as an active material process combining passive materiality, order and intelligibility.

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