Life, Birth and Death in Democritus. Atomistic Reflections Between Physics and Ethics*

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Judging by the series of texts concerning the subject of life, birth and death in Democritus, we find, in his reflections and enquiries, his interest in the way men of his time faced the processes of birth and death. His reflections include a wide range of perspectives and aspects that include examining human behaviour in the face of death and investigating how it reveals a certain temperament or inclination, inquiring about the nature of these processes and extending the analyses of the processes of birth and death to whole beings through the couple generation-corruption. Democritus' physical doctrine postulates that birth/generation and death/corruption are truly no more than just aggregation and separation of substances or primary elements. In this exposition, we intend to examine the main theses and arguments which appear in all testimonies and fragments through which

* An eariler version of this text was presented at the Fifth Biennial Conference of The International Association for Presocratic Studies held at the University of Texas in Austin in 2016

Democritus' thought was transmitted from antiquity. Furthermore, we will also discuss the hypotheses that, for Democritus, the most important opposition was not life-death, but rather birth-death, and that, at the same time, his idea of nature and life comprises both processes in the perspective of atomistic philosophy. Thus, we will lay the foundations for a consideration of Democritus' judgment of the processes through which he intends to reveal the intelligibility of the whole *kosmos*. If our hypotheses are verified, we will have proof that corruption has to be considered in two different ways, that is, in the context of the physical processes that sustain the *kosmos* in its persistence, and in the context of the existence of natural beings, both living and lifeless. Finally, setting out from that analysis, we intend to extract from the *corpus* of Democritus' testimonies and fragments the specificity and value of the terms *bios* and *zoê*.

One of the most important aspects of this subject concerns the way men usually regard the phenomenon of death, their expectations as to what can happen to them, and the attitudes and behaviors that result from their judgement about it. On this, the first group of texts can be referred to:

> The world is a stage, life is a performance: you come, you see, you go away.[1]
> One must realize that human life is weak and brief jumbled together with many cares and calamities, so that one may care for moderate possessions and gauge one's hardship by needs.[2]
> Some men who are ignorant of the dissolution of mortal nature, but conscious of their evil actions in life, consume their lives worrying and feeling guilty, and invent myths about the time after death.[3]

In the first sentence, the relation between *kosmos* and *bios* is fixed in spatial-temporal terms, where the former is related to the latter as something containing, durable, and able to hold it in its episodic feature, as a stage where life unfolds itself. The fragment evokes also the feature of *bios* compared to *kosmos*: there you come, see and go away. It, thus, highlights an opposition between something durable, the *kosmos*, receptacle of *bioi*, and the *bioi*, in their brief and ephemeral duration. To that perception the image of fragility exposed in B 285 is connected. Human life / ἀνθρωπίνη βιοτή appears, once more, characterized by its feebleness / ἀφαυρός and by its short duration / ὀλιγοχρόνιος, and it is always jumbled together with cares and calamities. On the other hand, the last text describes the attitude of those who, while ignoring the corruptibility of human nature,

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[1] Our translation. Demokrates, 9 (DK 68 B 115): ὁ κόσμος σκηνή, ὁ βίος πάροδος· ἦλθες, εἶδες, ἀπῆλθες. Unless otherwise noted, all translations are by D. Graham (2010).

[2] Stob. 4.34.65 (DK 68 B 285): γινώσκειν χρεὼν ἀνθρωπίνην βιοτὴν ἀφαυρήν τε ἐοῦσαν καὶ ὀλιγοχρόνιον πολλῆισίν τε κηρσὶ συμπεφυρμένην καὶ ἀμηχανίηισιν, ὅκως ἄν τις μετρίης τε κτήσιος ἐπιμέληται καὶ μετρῆται ἐπὶ τοῖς ἀναγκαίοις ἡ ταλαιπωρίη.

[3] Stob. 4.52.40 (DK 68 B 297): ἔνιοι θνητῆς φύσεως διάλυσιν οὐκ εἰδότες ἄνθρωποι, συνειδήσει δὲ τῆς ἐν τῶι βίωι κακοπραγμοσύνης, τὸν τῆς βιοτῆς χρόνον ἐν ταραχαῖς καὶ φόβοις ταλαιπωρέουσι, ψεύδεα περὶ τοῦ μετὰ τὴν τελευτὴν μυθοπλαστέοντες χρόνου.

pass their life afraid of the remaining time and try to minimize that fear by inventing tales about what will happen after death. They do not live in accordance with their nature and they set their minds beyond the here-and-now of life. What is important in that fragment for the argument we intend to develop here is the incapacity (οὐκ εἰδότες) of some men (ἔνιοι ἄνθρωποι) of identifying the dissolution (διάλυσις) of the mortal nature (θνητή φύσις). This remark sets the problem in the context of a partial difficulty they have in perceiving their own nature, considering their ignorance about what things really are.

Reading back testimonies and fragments concerning Empedocles', Anaxagoras' and Democritus' physics, we can notice that they all agree in that basic notion: there is no death or birth as individual realities, but merely aggregation and separation of eternal elements – Empedocles' four elements or *rhizomai*, Anaxagoras' *homeomeriai*, Democritus' *atoms*. Aggregation and separation are processes that presuppose the eternity of the primary elements, and generate as well as ensure the plurality of the universe and its persistence in being.

As a starting point for our analysis, we have chosen three convergent testimonies where the authors present their opinions on the topic. The first one, transmitted by Simplicius and speaking of Anaxagoras, relates:

> Coming to be and perishing the Greeks do not treat properly. For no object comes to be or perishes, but each is mixed together from and segregated into existing objects. And thus they should really call coming to be mixture and perishing segregation.[4]

The next one, which Plutarch ascribes to Empedocles, echoes to the previous one:

> I shall tell you another thing: there is no birth of any of all
> mortal things, neither any end of destructive death,
> but only mixture and separation of mixed things
> exist, and birth is a term applied to them by men.[5]

Simplicius ascribes to Democritus a similar purpose, following his quotation of a passage from Aristotle's *Peri Democritou*:

> He says that coming to be and its opposite, separation, occur not only in the case of animals but also in plants and worlds and in general all sensible bodies. Now if coming to be is the

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[4] Simp. *in Ph.*163.20–24, 5–7 (DK 59 B 17): Τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι οὐκ ὀρθῶς νομίζουσιν οἱ Ἕλληνες οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται, ἀλλ' ἀπὸ ἐόντων χρημάτων συμμίσγεταί τε καὶ διακρίνεται. Καὶ οὕτως ἂν ὀρθῶς καλοῖεν τό τε γίνεσθαι συμμίσγεσθαι καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι.'

[5] Plu. *adv. Colot.* 10 (DK 31 B 8): ἄλλο δέ τοι ἐρέω· φύσις οὐδενὸς ἔστιν ἁπάντων / θνητῶν, οὐδέ τις οὐλομένου θανάτοιο τελευτή, / ἀλλὰ μόνον μίξις τε διάλλαξίς τε μιγέντων / ἔστι, φύσις δ' ἐπὶ τοῖς ὀνομάζεται ἀνθρώποισιν.

> joining together of atoms, and passing away is their separation, according to Democritus too, coming to be would be alteration.[6]

Generation is not a fusion of elements, but a *com-position*, a putting together of elements. Perishing, in its turn, is not a complete destruction, or annihilation, but a process through which the primary elements return to their previous state, becoming available again to form new compositions and associations. Therefore, we can say that the same idea motivates these philosophers in their judgment about the processes that delimit the existence of each natural being, and, in the case of the living ones, their life. Apart from the differences that distinguish them, what catches the attention in the testimonies and fragments is that all these philosophers seem to have placed the problem of the couple death-life in the area of birth and death, putting both in the horizon of life, of *physis*, as constitutive moments of its process of generation and renewal and not as its opposite.

Empedocles, Anaxagoras and Democritus tried to construct a theoretical pattern that would allow them to analyze phenomena and processes of nature. We have, then, a pattern with two different levels. The first and most basic one comprises the elementary principles, active and passive, that are meant to explain and justify the physical reality in its unity, making the totality of all perceptible phenomena comprehensible. Empedocles' roots, Anaxagoras' seeds and Democritus' atoms have all the rational features required by Parmenides' logic: they are eternal, not generated, unchangeable and always identical with themselves;[7] but being different, which is necessary to explain the coming to be, entails that they are more than one, in movement, and that they have a bodily nature that is almost incorporeal and invisible.

The second level concerns the apparent, variable and ephemeral dimension of compounds. All of empirical reality and the totality of "coming to be" result from these principles. This derivation provides the basis for scientific explanation of the phenomena, insofar as rational comprehension is a reduction of them, by logical processes, to the principles from which they result.[8]

Thus, it is not possible to talk about generation and perishing in the proper sense regarding the elementary principles, for they are always, can neither cease to be, nor

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[6] Our traslation. Simp. *in Cael.* 294.33–295.36 (DK 68 A 37): Λέγει δὲ τὴν γένεσιν καὶ τὴν ἐναντίαν αὐτῆι διάκρισιν οὐ μόνον περὶ ζώιων, ἀλλὰ καὶ περὶ φυτῶν καὶ περὶ κόσμων καὶ συλλήβδην περὶ τῶν αἰσθητῶν σωμάτων ἁπάντων. Εἰ τοίνυν ἡ μὲν γένεσις σύγκρισις τῶν ἀτόμων ἐστίν, ἡ δὲ φθορὰ διάκρισις, καὶ κατὰ Δημόκριτον ἀλλοίωσις ἂν εἴη ἡ γένεσις.

[7] Democritus and other pluralistic philosophers accepted the Parmenidean postulate of eternity – *nothing can come to be out of nothing* – but they could not accept his postulate of *stasis*. Rather, for atomists, the intelligibility of their argument depends on the claim that the movement of atoms is inherent to them, always was, is and will be. In fact, their movement can be modified – from free movement in a vacuum to vibratory movement when inside a compound – but it cannot end.

[8] Little by little, they realized that a recourse to sensitive experience as the source and *topos* of their observations was not enough to provide an explanation that could satisfy the imperative of intelligibility. They started to realize that the more they withdrew from the ephemeral consistence of the phenomenal order of things, the

become. However, it is possible to talk about generation and perishing with regard to compounds, for we can say that they are born and die, but to be born and to die as generation and perishing is nothing more than aggregation and separation of the primary elements, which exist by themselves eternally, and are eternally identical.[9] These elements should be the basic constituents of things, their matter or that which guarantees the "subsistence" of the cosmos, given its state of continuous flow of generation and perishing.[10]

The atomic theory appears as the natural consequence of the experience of the senses and the discovery of its limits: the phenomenal reality does not constitute the whole reality of things. The senses meet their limits, since they see themselves dealing with bodies that are nearly incorporeal and which, due to their extreme subtlety, elude them. They can only grasp that what is the object of sight, hearing, smell, taste and touch. It is necessary, then, to find another path, different from the one offered by sense perception, through which the non-phenomenal dimension of things can be reached.

Among the most important texts considering this question, we find the fragments preserved in Sextus Empiricus' *Adversus Mathematicos*:

> Democritus sometimes rejects what appears to the senses, and maintains that none of these appears in truth, but only to opinion, but truth in existent things consists of there being atoms and the void. 'For by convention, he says, sweet, by convention bitter, by convention hot, by convention cold, by convention color, but in reality atoms and void. In others words: the objects of sensation exist by agreement and opinion, not in truth, but only atoms and the void really exist.'
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> In the *Confirmations*, although he promises to attribute to the senses the strength of conviction, he nonetheless ends up condemning them. For he says, 'In reality we understand nothing securely, but we perceive what changes in relation to the disposition of the body as things enter or resist'.[11] (...)

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more it was possible to reach a level of intelligibility that could handle reality. It is interesting to note that the possibility of understanding the visible reality of the world seemed to presuppose the identification of elements that, even though similar to the observable things, could not be reduced to what they would seem (in appearance) if they could be contemplated by the senses.

[9] Involved in the understanding of the phenomenal character of the surrounding reality, the first philosophers were confronted with the challenge of finding a parameter or fundament that would allow them to explain the nature of things, their constitution and their becoming. Their first impulse was to identify/postulate one or more elements that could play the role of primary elements inside the cosmos.

[10] On the other hand, the primary elements could contribute to the construction of an intelligible speech. In other words, it was all about finding some kind of a lowest common denominator capable of solving the cosmological *equation*.

[11] S.E. *M.* 7.135–136 (DK 68 B 9 and 10 = Luria 55): (135) Δημόκριτος δὲ ὁτὲ μὲν ἀναιρεῖ τὰ φαινόμενα ταῖς αἰσθήσεσι καὶ τούτων λέγει μηδὲν φαίνεσθαι κατ᾽ ἀλήθειαν, ἀλλὰ μόνον κατὰ δόξαν, ἀληθὲς δὲ ἐν τοῖς οὖσιν ὑπάρχειν τὸ ἀτόμους εἶναι καὶ κενόν· νόμωι γάρ φησι γλυκύ, (καὶ) νόμωι πικρόν, νόμωι θερμόν, νόμωι ψυχρόν, νόμωι χροιή, ἐτεῆι δὲ ἄτομα καὶ κενόν (= DK 68 B 125) (ὅπερ <ἔστι>· νομίζεται μὲν εἶναι καὶ

> In the *Standards*, he says there are two kinds of knowledge: one through the senses, the other through thought (...). He says *verbatim*: 'Of cognition there are two kinds, one legitimate, one bastard. Of the bastard kind are these: sight, hearing, smell, taste, touch. And there is the legitimate kind, which is distinct from the latter.'
> Then, he adds these words, favoring the legitimate over the bastard: 'Whenever the bastard kind is no longer able to see anything smaller or hear, smell, taste, or perceive by touch, but <must make> finer discriminations, <the legitimate kind takes over>.'[12]

The neuter τὸ φαινόμενον, commonly referred to the objects of sensations, will be useful later to indicate what is "visible" to the intellect. Among the philosophers prior to Plato, the term is usually used to indicate the apparent aspect of a reality, its visible surface, the sensible one as opposed to true thinking,[13] which does not mean, however, that phenomenal reality is necessarily irrelevant as an object of knowledge. At any rate, we can say that the sense highlighted by the use of the term is the one that has to do with the apparent and immediate order of the world. If the phenomena are identified in the apparent surface of things, they are, nevertheless, necessarily in connection with what is the most basic in them.

According Democritus, the object of legitimate knowledge, the truth object, is in the depths (ἐν βυθῶι γὰρ ἡ ἀλήθεια, DK 68 B 117[14]), which makes the way that comes from sensitive perception to intelligible apprehension not ascendant, but descendant. It is about diving into the deepness of things to look for what is not visible at the surface. Real knowledge is abyssal.[15] We detach our senses from the "surface" of things to take the proper distance necessary to cross it and to penetrate the reality of that which it is made

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δοξάζεται τὰ αἰσθητά, οὐκ ἔστι δὲ κατ᾽ ἀλήθειαν ταῦτα, ἀλλὰ τὰ ἄτομα μόνον καὶ τὸ κενόν). (136) ἐν δὲ τοῖς Κρατυντηρίοις, καίπερ ὑπεσχημένος ταῖς αἰσθήσεσι τὸ κράτος τῆς πίστεως ἀναθεῖναι, οὐδὲν ἧττον εὑρίσκεται τούτων καταδικάζων. φησὶ γάρ· ἡμεῖς δὲ τῶι μὲν ἐόντι οὐδὲν ἀτρεκὲς συνίεμεν, μεταπῖπτον δὲ κατά τε σώματος διαθήκην καὶ τῶν ἐπεισιόντων καὶ τῶν ἀντιστηριζόντων.

[12] S.E. *M.* 7.138 (DK 68 B 11 = Luria 83): ἐν δὲ τοῖς Κανόσι δύο φησὶν εἶναι γνώσεις· τὴν μὲν διὰ τῶν αἰσθήσεων τὴν δὲ διὰ τῆς διανοίας (...) (139) λέγει δὲ κατὰ λέξιν· γνώμης δὲ δύο εἰσὶν ἰδέαι, ἡ μὲν γνησίη, ἡ δὲ σκοτίη· καὶ σκοτίης μὲν τάδε σύμπαντα, ὄψις, ἀκοή, ὀδμή, γεῦσις, ψαῦσις. ἡ δὲ γνησίη, ἀποκεκριμένη δὲ ταύτης. εἶτα προκρίνων τῆς σκοτίης τὴν γνησίην ἐπιφέρει λέγων· ὅταν ἡ σκοτίη μηκέτι δύνηται μήτε ὁρῆν ἐπ᾽ ἔλαττον μήτε ἀκούειν μήτε ὀδμᾶσθαι μήτε γεύεσθαι μήτε ἐν τῆι ψαύσει αἰσθάνεσθαι, ἀλλ᾽ ἐπὶ λεπτότερον <δέηι ζητεῖν, τότε ἐπιγίνεται ἡ γνησίη ἅτε ὄργανον ἔχουσα τοῦ νῶσαι λεπτότερον>.

[13] *Cf.* Empedocles: "Empedocles [says there are] two suns: the original, being fire in one hemisphere of the world, having filled the hemisphere, is always stationed opposite its own reflection; and the apparent one (τὸν δὲ φαινόμενον), being a reflection in the other hemisphere filled with air mixed with heat, coming to be by reflection from the circular earth to the ice like sun, is drawn around by the motion of the fiery stuff. In short, the sun is said to be the reflection of the fire about the earth. The one that is a reflection is equal to the earth in size." (Aet. 2.20.13 = DK 31 A 56).

[14] D.L. 9.72 = DK 68 B 117: ἑτεῆι δὲ οὐδὲν ἴδμεν· ἐν βυθῶι γὰρ ἡ ἀλήθεια.

[15] This image of depth that characterizes the object of true knowledge evokes the testimony of Diogenes Laertius about Socrates' opinion concerning Heraclitus' book: "The part I understand is excellent, and so too is, I dare say, the part I do not understand; but it needs a Delian diver to get to the bottom of it." (D.L. 2.22).

of. According to Ferrari,[16] the authentic way of knowing is dynamic, a direction. In fact, Democritus says the knowledge in question is ἐπὶ λεπτότερον, implying the movement that comes from the thicker towards the thinner. But, what is the direction? "In reality" (ἐτεῇι), as Sextus explains, it is "atoms and void".

Atoms and the void constitute the intimate and invisible instance of things, the condition of possibility of their effective visibility that raises them to the level of intelligibility through explaining their atomic constitution. They are the product of this finer way of perception,[17] which is represented by the intellect, from which legitimate knowledge is obtained, since it is solely capable of knowing clearly what the senses capture obscurely, and, consequently, erroneously. What we have here is an evaluation of different levels of perception or resolution of things that is similar to what happens when we classify our modern machines that capture and project images in devices of slow or high resolution.[18]

What is the reason, then, of mistaken judgments concerning natural events and, more specifically, birth and death? Our hypothesis is that the key point of the issue lies in the connection between sensation and intellection, where a failure of such a connection would be the origin of obscurity in perception. If Democritus assumed that both activities belong to the soul, then it would be strange if there were no relation between them. If we assume this connection, then we can only state the "how and when" of its contiguity. Immediately, we can assume as a premise that the nature of the objects inherent to our perception, in order to be fully known, requires an association of those two activities of the soul.[19] In some situations these two activities may seem sufficient, each one in its turn, when we are dealing with the concrete existence of man, but in the ultimate horizon of Democritus' speculation it becomes necessary to appeal to the invisible reality, not only to comprehend the visible reality but also to make the visible reality effective in its possibilities. This is what happens when we try to understand human nature, the processes that constitute human life in its development, as well as those in which it is involved.

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[16] Ferrari 1980: 76.

[17] Fritz 1966: 23.

[18] While in the phenomenal plan we have an image without focus, with low resolution, in the plan of atoms and void we deal with a high-resolution image, free from interferences that prevent us of distinguishing its contours. The object captured in this way is revealed in the clarity of its lines with a clear definition of its structure. As noted by Ferrari, we face a type of *codex* that translates the percipient data in properties or characteristics of primary elements, i.e. atoms, and thought as not later decomposed" (Ferrari 1980: 77).

[19] Two texts testify to the controversial question concerning the existence of parts or faculties in the soul. For Aëtius, Democritus and Epicurus said that the soul would have two parts, the rational (τὸ μὲν λογικόν) and the irrational (τὸ δὲ ἄλογον) (Aet. 4.4.6 = DK 68 A 105). For Philoponos, there would be no parts or faculties in the soul, and thinking and feeling would be one and the same thing (ταὐτὸν εἶναι λέγων τὸ νοεῖν τῶι αἰσθάνεσθαι), proceeding from the same faculties (ἀπὸ μιᾶς ταῦτα προέρχεσθαι δυνάμεως) (Phlp. *In de An.* 35. 12 = DK 68 A 105). Based on other testimonies about the nature of the soul, we think that, for Democritus, sensation and intellection constitute distinct degrees of the activity of the soul, and intellection can reach where sensation cannot. For this reason, intellection is the finest cognitive activity of the soul. For lack of space, I cannot discuss this problem more extensively here, but I refer the reader to another text where I discuss this subject specifically: "Do sentir ao inteligir: a propósito do testemunho DK 68 A 105 de Demócrito" (Peixoto 2012).

From a physical, ontological and epistemological point of view, it is possible to realize the fundamental character of the invisible corpuscles. "It is from those substances (ἐκ τούτων)" that the processes of generation/aggregation and corruption/disintegration are produced. The inadequacy of the senses becomes manifest when using them we find their limitations in the apprehension and understanding of sensitive objects. Thus, the error attributable to those who limit their knowledge to the understanding of the apparent order of things is that they do not sufficiently consider what birth and death are, that is, aggregation and separation of atoms. Once it is established that all observable bodies, without exception, are made of atoms and void, one cannot say that one knows a certain thing before examining it in its intimate nature, that is, after having taking into consideration its atomic structure. This opens a new perspective, and the perception of things becomes clearer regarding their sensitive manifestation.

Thus, we have to distinguish two ways of Being. The first one comprises the single bodies, the atoms (eternal and autonomous), and the void, which do not have origin and remain in a kind of temporal circularity with infinite successions of aggregation and disaggregation, but without any alteration, except an accidental and circumstantial one. Hence, we can say that atoms, being continuous, remain in a temporal perspective, in a circular order determined by the operations of *synkrisis* and *diakrisis*. Many terms are suitable to describe these processes, and on their circularity or succession depends the very persistence of the cosmos, i.e., its eternity.

The other way comprises compound bodies which are ephemeral and dependent. Both the simpler bodies compounds (for example the four elements) and the more complex bodies compounds (their various combinations) remain in a linear temporal order in which they experience, in their singular existence, beginning and end, birth and death, generation and corruption, whatever the names we use to refer to these processes or aspects of the same process. In fact, as Plutarch testifies, Democritus distinguishes two plans or dimensions of reality:

> (1) a "totality without limits" (τὸ πᾶν ἄπειρον), without temporally determined limits, because "it was not in any way created by anyone" (διὰ τὸ μηδαμῶς ὑπό τινος αὐτὸ δεδημιουργῆσθαι); that of the primary substances, that is, the atoms and the void, which are "changeless" (ἀμετάβλητον, DK 68 A 39), "undifferentiated and incapable of being affected" (ἀποίους καὶ ἀπαθεῖς, DK 68 A 57), "predetermined by necessity" (προκατέχεσθαι τῆι ἀνάγκηι), and making "all things that were and are and will be" (πάνθ' ἁπλῶς τὰ γεγονότα καὶ ἐόντα καὶ ἐσόμενα, DK 68 A 39[20]);

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[20] [Plu.] *Strom.* 7: Δημόκριτος ὁ Ἀβδηρίτης ὑπεστήσατο τὸ πᾶν ἄπειρον διὰ τὸ μηδαμῶς ὑπό τινος αὐτὸ δεδημιουργῆσθαι. Ἔτι δὲ καὶ ἀμετάβλητον αὐτὸ λέγει καὶ καθόλου οἷον πᾶν ἐστιν ῥητῶς ἐκτίθεται· μηδεμίαν ἀρχὴν ἔχειν τὰς αἰτίας τῶν νῦν γιγνομένων, ἄνωθεν δ' ὅλως ἐξ ἀπείρου χρόνου προκατέχεσθαι τῆι ἀνάγκηι πάνθ' ἁπλῶς τὰ γεγονότα καὶ ἐόντα καὶ ἐσόμενα.

(2) that of the atomic compounds or agglomerates, which can be more or less complex, lifeless or living; its presence is the most important trait in the process of determining the living beings and it fulfills the function of a motor of all operations through which life manifests itself – breathing, growing, reproducing, but also perception and intellection; a necessary predisposition to change characterizes the nature of all living beings; hence, the processes of generation and corruption are the marks of everything that exists in the *kosmos* with no exception – that is what distinguishes them in nature from the primary elements.

What defines, however, a compound as living? It has been shown so far that all bodies are composite beings. What remains to be examined is that which determines that only some of these compounds are animated bodies or, in other words, living bodies.

The explanation of life in Democritus advances far beyond a strict consideration of the atomic structure of living beings. He postulates that the soul is responsible for the animation of living beings, namely respiration, production of movement, change, and, therefore, the processes of growing, reproducing and aging, with sensation and intellection as operations of the soul that are of vital importance for the economy of living beings.[21] In summary, he conceives the soul as that which moves the whole body, being itself a body capable of perceiving and understanding. The role that Democritus attributes to the soul in his explanation of human life can be appreciated in the scheme suggested by one of *tetralogiai* listed in the catalogue of his works by Thrasyllus, as reported by Diogenes Laertius.[22]

IV.
1. Book One *On Nature*;
2. Book Two *On the Nature of Man* (or: *on Flesh*);
3. *On Mind*;
4. *On the Senses* (some combine these two under the title *On the Soul*).

Once one understands that life, as the time between birth and death for the living beings[23] as well as the natural ones, has its permanence and its limits in the processes

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[21] In Book I of *De anima*, Aristotle says that "the soul is the principle (*archê*) of animals" (*de An.* 402a6–7). In his examination of these subjects, he presents the main features of the soul movement, sensation and its almost incorporeal character.

[22] D.L. 9.46 = DK 68 A 33: IV.1. Περὶ φύσεως πρῶτον; 2. Περὶ ἀνθρώπου φύσιος (ἢ Περὶ σαρκός) δεύτερον; 3. Περὶ νοῦ ; 4. Περὶ αἰσθησίων (ταῦτά τινες ὁμοῦ γράφοντες Περὶ ψυχῆς ἐπιγράφουσι).

[23] In some texts, we get the impression that the terms βίος and ζωή, as well as their derivatives, are confused. But while the nouns βίος, βιοτή and the verb βιόω relate, in the context of testimonies and fragments of Democritus, specifically to human life and to a mode of life, the nouns ζωή and ζώιον, as well as the verb ζάω, relate to all living beings, i.e., to any natural being endowed with animation. Nevertheless, their senses converge in the case of human living, and both are employed with similar values when it comes to describing human behavior: *zôê* /*zôion* / *zaô* , *cf*. DK 68 A 33, 40, 69, 77, 79, 116, 139, 154, 164, 257, 278; B 53, 99, 160, 199, 205, 245; *bios*/ *bioô*/ *biotê*, *cf*. B 43, 61, 115, 119, 159, 189, 191, 200, 204, 223. The catalog of Thrasyllus, reported by Diogenes Laertius, indicates that the title of one of the treatises is not classifiable (Τὰ ᾽Ασύντακτά): Αἰτίαι περὶ

of generation and corruption, one should also consider the role played by the soul and breath in the "maintenance" of life. We owe to Aristotle the most significant testimonies in this regard. These testimonies tell us about the atomic figures that make up the soul and the manner in which these atoms are replenished and dispersed in the environment by breathing. Breathing is, then, one of the main factors that ensure the dynamic balance of life in all living compounds. By inhaling, the soul is replenished with atoms in a sort of *synkrisis* and by exhaling the atoms are dispersed, which would be, on a smaller scale, a form of *diakrisis*.

The *analysis* of the process of breathing confirms the relativity of the soul's capacity to move. This point is discussed by Aristotle in two places in the *De anima* and also in a passage of the *Parva Naturalia*:

> Democritus says [the soul] is a kind of fire and heat. There are an infinite number of atoms and figures . . . and he calls the collection of seeds the elements of nature as a whole (and Leucippus says the same). Of these the spherical atoms comprise soul, because such contours (ῥυσμούς) are most apt to penetrate through everything and to make the others move by their own motions, on the assumption that the soul provides animals with motion. That is why breath is also a sign of life: since the atmosphere exerts pressure on animal bodies and squeezes out those figures that cause motion in animals by never being at rest, breath helps them by supplying similar bodies from outside which enter as the animal breathes in. For the new atoms prevent those already in the animal from escaping, and they help counteract the atmospheric pressure. So animals live as long as they can breathe.[24]

> Democritus says that inhalation has a certain effect on animals, claiming that it inhibits the expulsion of the soul. He has not, however, said anything about nature acting for this reason. In general, just like the other natural philosophers, he does not grasp the final cause. He says that soul and heat are the same thing, the primary spherical figures. When these escape as a result of pressure from the atmosphere, he says inhalation helps. For in the air there is a great number of those kind of atoms he calls mind and soul. So when the animal inhales and the air enters, these atoms entering with it counteract the external pressure and keep the soul insi-

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ζώιων αβγ. One might conjecture that the object of that study was the *zoogoniai*, a theme about which he seemed very interested (according to Aëtius, Lactantius and Censorinus in DK 68 A 139, to Aelian in DK 68 A 152, and also to the reports of Diodoros Siculus, Hermipus and Tzetzes presented in DK 68 B 5).

[24] Arist. *de An.* 1.2, 404a9-15 = DK 67 A 28: Ὅθεν Δημόκριτος μὲν πῦρ τι καὶ θερμόν φησιν αὐτὴν εἶναι· ἀπείρων γὰρ ὄντων σχημάτων καὶ ἀτόμων τὰ σφαιροειδῆ πῦρ καὶ ψυχὴν λέγει (οἷον ἐν τῷ ἀέρι τὰ καλούμενα ξύσματα, ἃ φαίνεται ἐν ταῖς διὰ τῶν θυρίδων ἀκτῖσιν), ὧν τὴν μὲν πανσπερμίαν στοιχεῖα λέγει τῆς ὅλης φύσεως (ὁμοίως δὲ καὶ Λεύκιππος), τούτων δὲ τὰ σφαιροειδῆ ψυχήν, διὰ τὸ μάλιστα διὰ παντὸς δύνασθαι διαδύνειν τοὺς τοιούτους ῥυσμοὺς καὶ κινεῖν τὰ λοιπά, κινούμενα καὶ αὐτά, ὑπολαμβάνοντες τὴν ψυχὴν εἶναι τὸ παρέχον τοῖς ζῴοις τὴν κίνησιν· διὸ καὶ τοῦ ζῆν ὅρον εἶναι τὴν ἀναπνοήν· συνάγοντος γὰρ τοῦ περιέχοντος τὰ σώματα καὶ ἐκθλίβοντος τῶν σχημάτων τὰ παρέχοντα τοῖς ζῴοις τὴν κίνησιν διὰ τὸ μηδ› αὐτὰ ἠρεμεῖν μηδέποτε, βοήθειαν γίνεσθαι θύραθεν ἐπεισιόντων ἄλλων τοιούτων ἐν τῷ ἀναπνεῖν· κωλύειν γὰρ αὐτὰ καὶ τὰ ἐνυπάρχοντα ἐν τοῖς ζῴοις ἐκκρίνεσθαι, συνανείργοντα τὸ συνάγον καὶ πηγνύον· καὶ ζῆν δὲ ἕως ἂν δύνωνται τοῦτο ποιεῖν.

> de the animal from passing outside. Consequently, life and death depend on inhalation and exhalation. For when atmospheric pressure prevails and, because the animal cannot inhale, material entering from outside can no longer counteract the pressure, then death comes to the animal. For death is the departure of these kinds of figures from the body as a result of expulsion of the atmosphere. But the reason why every living thing must die sometime, not just on some occasion, but naturally in old age, or violently contrary to nature, he has not explained at all.[25]

In both instances, the Democritean conception of breathing is schematically reported as follows: atoms constituting the core are in constant motion and the outside environment exercises a constant pressure over the enveloped body; the soul is expelled outwards, but, through inhalation, similar figures penetrate into the body, thereby ensuring the continuity of life.

These two statements are the only ones that report on the Democritean theory of life and they raise the problem of its definition and explanation. For Aristotle, it demonstrates the insufficiency of the atomistic conception of life, due to the absence of any finalistic explanation. In the above quoted passage of *De anima*, Aristotle says that it is not breathing, but the nature of animate beings that defines life: "Among the natural bodies, some have life, others do not, and we mean life as these three facts: to feed, to grow and to perish by itself".[26] Life is already present in the organized body and the role of the soul would be only to actualize what is already there in potency. Life, therefore, is not limited to breathing. Democritus was wrong in saying that the soul provides motion for animals and that breathing would have no other effect than maintaining a fairly stable amount of spherical atoms in the body. Aristotle reproaches Democritus also for not saying whether the cause of death is external or internal.

However, beyond his simplification of the Democritean conception of life, Aristotle tells us, even if indirectly, what could be his design. There is no qualitative definition of the cessation of life, because, as we learn from other testimonies, the deaths of the soul

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[25] Arist. *Resp.* 471b30–472a18 = DK 68 A 106: Δημόκριτος δ' ὅτι μὲν ἐκ τῆς ἀναπνοῆς συμβαίνει τι τοῖς ἀναπνέουσι λέγει, φάσκων κωλύειν ἐκθλίβεσθαι τὴν ψυχήν· οὐ μέντοι ὡς τούτου γ' ἕνεκα ποιήσασαν τοῦτο τὴν φύσιν οὐθὲν εἴρηκεν· ὅλως γὰρ ὥσπερ καὶ οἱ ἄλλοι φυσικοί, καὶ οὗτος οὐθὲν ἅπτεται τῆς τοιαύτης αἰτίας. Λέγει δ' ὡς ἡ ψυχὴ καὶ τὸ θερμὸν ταὐτόν, τὰ πρῶτα σχήματα τῶν σφαιροειδῶν. Ἐκκρινομένων οὖν αὐτῶν ὑπὸ τοῦ περιέχοντος ἐκθλίβοντος, βοήθειαν γίνεσθαι τὴν ἀναπνοήν φησιν. Ἐν γὰρ τῷ ἀέρι πολὺν ἀριθμὸν εἶναι τῶν τοιούτων ἃ καλεῖ ἐκεῖνος νοῦν καὶ ψυχήν· ἀναπνέοντος οὖν καὶ εἰσιόντος τοῦ ἀέρος συνεισιόντα ταῦτα καὶ ἀνείργοντα τὴν θλίψιν κωλύειν τὴν ἐνοῦσαν ἐν τοῖς ζῴοις διέναι ψυχήν, καὶ διὰ τοῦτο ἐν τῷ ἀναπνεῖν καὶ ἐκπνεῖν εἶναι τὸ ζῆν καὶ ἀποθνήσκειν· ὅταν γὰρ κρατῇ τὸ περιέχον συνθλῖβον, καὶ μηκέτι ‹τὸ› θύραθεν εἰσιὸν δύνηται ἀνείργειν, μὴ δυναμένου ἀναπνεῖν, τότε συμβαίνειν τὸν θάνατον τοῖς ζῴοις· εἶναι γὰρ τὸν θάνατον τὴν τῶν τοιούτων σχημάτων ἐκ τοῦ σώματος ἔξοδον ἐκ τῆς τοῦ περιέχοντος ἐκθλίψεως. Τὴν δ' αἰτίαν διὰ τί ποτε πᾶσι μὲν ἀναγκαῖον ἀποθανεῖν, οὐ μέντοι ὅτε ἔτυχεν ἀλλὰ κατὰ φύσιν μὲν γήρᾳ, βίᾳ δὲ παρὰ φύσιν, οὐθὲν δεδήλωκεν.

[26] Arist. *de An.* 2.1, 412a14–15: Τῶν δὲ φυσικῶν τὰ μὲν ἔχει ζωήν, τὰ δ' οὐκ ἔχει· ζωὴν δὲ λέγομεν τὴν δι' αὑτοῦ τροφήν τε καὶ αὔξησιν καὶ φθίσιν. Ὥστε πᾶν σῶμα φυσικὸν μετέχον ζωῆς οὐσία ἂν εἴη, οὐσία δ' οὕτως ὡς συνθέτη.

and body do not happen suddenly, but gradually.[27] Indeed, to understand animation and its continuity, we would have to consider the complex formed by the body, the soul and the environment.[28] Within the framework that explains the exchange of spherical atoms between the body and the environment through the breathing process, we could ask if there could be another way of performing the operations of *synkrisis* and *diakrisis* referring to all compounds bodies. But this is a topic for another discussion.

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[27] *Cf.* Aet. 4.7.4 = DK 68 A 109, Alex.Aphr. *in Top*. 21.21 = DK 68 A 117; Cels. 2.6 = DK 68 A 160.

[28] There are many testimonies concerning the Democritean inquiry into living beings, as for instance, the extracted testimonies of the *Nature of Animals* of Aelian (DK 68 A 150a, 151, 152, 153, 154, 155, 155a, 156), who allow us to learn what his ideas were. In this way, we can understand why Democritus appears in the *On the Generation of Animals* as one of the major opponents of Aristotle, which demonstrates the breadth and speculative value of his inquiry in the biological field. We can also see the interest demonstrated by philosophers and doxographers posterior to Aristotle.

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Life, Birth and Death in Democritus. Atomistic Reflections Between Physics and Ethics

The subject of life, birth and death constitutes one of the main topics in Democritus' reflection on human questions. He seeks to understand what men think about the processes of birth and death and how they, accordingly, determine their behavior and attitudes. His reflections comprise a wide range of perspectives and aspects that include examining human behaviour and investigating how it reveals a certain temperament or inclination, inquiring about the nature of these processes and extending the analyses of the processes of birth and death to whole beings through the couple generation-corruption. In the present paper, I intend to examine the main theses and arguments which appear in the testimonies and fragments through which Democritus' thought was transmitted from antiquity. Furthermore, I will also discuss the hypotheses that for Democritus the most important opposition was not life-death, but rather birth-death and that, at the same time, his idea of nature and life comprises both processes in the perspective of atomistic philosophy. I shall show that corruption has to be considered in two different ways, that is, in the context of physical processes that keep the *kosmos* in its persistence and in the context of the existence of natural beings, both living and lifeless.

KEYWORDS

Democritus; life; birth; death; generation; corruption.