
ALTERATION AND IDENTITY: HERACLITUS, THE EARLIER PRESOCRATICS, AND CONTEMPORARY SCIENCE

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In this essay I examine the theory of alteration and identity of the cosmos and the Being in the Presocratics, from Thales to Parmenides. We try to show that it was really Heraclitus, the first Presocratic philosopher, who invented this theory, which still echoes today in the most recent astrophysical theories on the universe.

In the first section (i) of our essay, I investigate the Heraclitean theory of alteration and identity of the cosmos and the Being. In the second section (ii), I research this dual theory; first, in the mythological tradition; and second, in Heraclitus' predecessors and contemporary Presocratic philosophers, from Thales to Parmenides. This is done in order to trace the presages and the loans of Heraclitus from them. In the third section (iii), I research the echo of Heraclitus' theory in contemporary science. The scope of this investigation is to show the originality of the Heraclitean cosmological/ontological theory of alteration and identity, both in antiquity and in contemporary science.

I

The world in the Heraclitean philosophy exists as the world *ἐν-πάντα*. This phenomenally dual, but substantially single nature of the world is subject to a paradoxical simultaneous alteration and identity,¹ according to Heraclitus. The nature of the world as *ἐν-πάντα* changes² eternally and cyclically from *ἐν* to *πάντα* and from *πάντα* to *ἐν*,³ while it simultaneously remains paradoxically in the identity *ἐν-πάντα*.⁴ In other words, the world as *ἐν* changes and is identified eternally with the world as *πάντα*, and the opposite. So, while the world eternally changes from *ἐν* to *πάντα* and from *πάντα* to *ἐν*, it always remains paradoxically the 'same' world at all times, as *ὁ αὐτὸς κόσμος*⁵ *ἐν-πάντα*. The world as *ἐν*, that is, the world as *πῦρ-λόγος-θεὸς-δίκη-ἔρις-πόλεμος-αἰὼν-σοφὸν-χρησιμοσύνη* or *χρεὼ καὶ κόρος-κεραυνὸς-νόμος-γνώμη*,⁶ which constitutes the one Being with its multiple modes in Heraclitus, changes⁷ into all of its individual multiple beings *πάντα*, and the opposite; while also the

world is simultaneously in identity, by being *ὁ αὐτός, εἷς καὶ κοινὸς κόσμος*⁸ *ἐν-πάντα*, since it always and eternally 'is' *τὸ αὐτὸ πῦρ-λόγος-θεὸς-δίκη-ἔρις-πόλεμος-αἰὼν-σοφὸν-χρημοσύνη* or *χρεὼ καὶ κόρος-κεραυνὸς-νόμος-γνώμη*.⁹ In other words, according to Heraclitus, the world is a multiple face of the eternal *αὐτὸ* but *μεταβάλλον* in-becoming-Being (*ἐν γίγνεσθαι εἶναι*).

This makes Heraclitus simultaneously the philosopher of eternal alteration and identity. Heraclitus thinks simultaneously of the cosmos and the Being as alteration and identity, together, and not only one or the other, opposite to each other, as it has been regarded up today. This means that Heraclitus thinks of the world-Being as eternally 'changing' and simultaneously the 'same', making first a cosmology/ontology, which meets today the most recent astrophysical theories in a remarkable way.

II

The views about the problem on the birth of early Greek philosophy, one of the most difficult and tantalising problems in the history of philosophy, are dissented. There are scholars who contend that the springs of inspiration of the early Greek thinkers must be sought in the previous mythological cosmotheories: such as Cornford,¹⁰ who thinks that Presocratic philosophy is much closer to the mythical and mysterious tradition, than to 'science',¹¹ as it lacks the experimentation, the method and the conception of 'science'; and Jaeger,¹² who thinks that there is continuity between the Ionian thought and the Homeric epics. On the contrary, there is also the opposite view, as of Burnet,¹³ who claims that the quest for the springs and inspirations of Presocratic philosophy in the mythical tradition is utterly wrong; or Helm,¹⁴ who regards that Heraclitus is cut off from the traditional religious thought of Homer, Hesiod, and the mysteries,¹⁵ or the point of view of Vernant,¹⁶ who considers that the Greek thought springs not from the tradition, but from *πόλις*, being political thought. Kahn¹⁷ thinks that the spring of the new philosophical tendency as ramification from the tradition of the poets and the wise ones, and the impossibility of the clear distinction between the two, is symbolised in Thales, who for this reason is placed among both sides, both as one of the seven sages, and as the first philosopher.

For each Presocratic philosopher, this quest acquires different dimensions, since others borrow much from the tradition, and others less. As a whole, however, all the Presocratics transcend by far the

mythical tradition, undertaking a first materialistic and 'scientific-philosophical' interpretation of the world; and wherever they borrow from the tradition they transform their loans into their own ideas, which as they are transformed in such a way, they consist their pure thoughts. In the case of Heraclitus, particularly, the religious and poetic tradition does not seem to presage (at all) the theme of alteration and identity of the cosmos and the Being. It is true, that Heraclitus borrows from the tradition the usage of the names of some deities, such as *Ζεύς*, *Διόνυσος*, *Ἄδης*, *Δίκη*, *Ἔρις*, and *Ἐρινύες*;¹⁸ however, he completely transforms all these deities into his own philosophical modes of Being, transcending thus the polytheistic anthropomorphism of the tradition;¹⁹ also, he makes other kinds of transformations of the tradition, such as the identification of *Διόνυσος* with *Ἄδης*, and *Δίκη* with *Ἔρις*. These new transformed Heraclitean ideas do not exist at all in the tradition. But specifically, the dual Heraclitean theme of the simultaneous alteration and identity of the cosmos and the Being is totally non-existent in the mythical and religious tradition.

The Pre-Heraclitean philosophical thought also does not seem to presage Heraclitean thought, as far as the theme 'alteration and identity of the cosmos and the Being' is concerned. No thinker, predecessor or contemporary of Heraclitus, created philosophy on the dual simultaneous phenomenon of the cosmic and ontological alteration and identity.²⁰ Certainly, the conception that the cosmos is changed is older than Heraclitus in the history of Greek philosophy.²¹ However, it is turbidly echoed in the doxographic tradition, as very few fragments are saved, and only of some Pre-Heraclitean thinkers; and wherever it is met, it is not in the cosmic level, but in the isolated level of the single material element that each philosopher recognises as the Being, or in plurality.²² On the contrary, the conception that the cosmos is identified with itself does not seem to be older than Heraclitus. The only common theory of Heraclitus with the Presocratics is the basic theory of all of them that the cosmos is in unity; but instead of limiting it to the primary element, as they do, Heraclitus expands it universally to all things, which thus consist a unified cosmic totality,²³ and he transforms this 'unity' into the 'identity' *ἐν-πάντα*.²⁴

In Thales, the idea of alteration is echoed in the doxographical tradition which mentions that the *ἕδωρ συγκεράννυται* to the other three structural material elements of the cosmos, implying thus its alteration to them.²⁵ Also, it is echoed as alteration of all the

cosmos,²⁶ as astronomical and earthy transformations of eclipses, rivers, etc.²⁷ as cyclical movement and alteration of the *ὑδωρ* and of the other material elements,²⁸ as movement of the earth floating over *ὑδωρ*,²⁹ and as eternal movement of the soul.³⁰ On the other hand, some filings of the idea of identity may be echoed in the tradition, which mentions that Thales considered the *ὑδωρ* as 'a same and eternally saving nature and substance',³¹ in the identity of life-death,³² and possibly in some kind of unity between water and some other fundamental terms of the cosmos, such as god, time, necessity, the wise, and mind.³³ Wheelwright,³⁴ however, regards Thales as significant, not because of his theory on the alteration of water, but because he first set the question "How does change come about?"

In Anaximander the concept of alteration is also echoed in the doxographical tradition as alteration of the cosmos as plurality,³⁵ as alteration of the four cosmic opposite elements because of the movement of the *ἄπειρον*,³⁶ as birth and death of everything, of all the eternal worlds and heavens because of the *πείρον* and its eternal movement,³⁷ and as astronomical, earthy, human and animal transformations.³⁸ Wheelwright³⁹ regards the Anaximandean theory of alteration as a forerunner of the Heraclitean theory in two respects: (1) that alteration is qualitative, and not spatial motion as it is for modern physical science, that is, it is an ontological alteration from one opposite to another; one opposite disappears when is changed and its other opposite takes its place; (2) the relation of alteration between the opposites is periodic and cyclic according to the rhythmic principle of the order of time. In Heraclitus, though, alteration is not limited only between the opposites, but extends universally in the cosmos and its Being, something that does not occur in Anaximander. On the other hand, the concept of identity in Anaximander is traced with difficulty. In his fragments it is not declared by himself, but by Aristotle as addendum, who merely equates the *ἄπειρον* with *θεῖον*,⁴⁰ while in the doxographies it is echoed only as synonymy of the infinite heavens and gods,⁴¹ and as unity of the opposites.⁴²

The first indication of presage of the Heraclitean alteration may be found in Anaximenes, as *ἐκροια* of the world as plurality from *ἀήρ*.⁴³ However, nothing else is saved in the authentic fragments of Anaximenes for this alteration, which is not made known if it is an alteration of the air into-and-from plurality, as it happens with the *πῦρ* of Heraclitus. In the doxographies the concept of alteration is

echoed as origin and end of the cosmic material elements from air, according to the alterations of its rarefaction and condensation, which are caused by the alterations of the opposites cold-warm,⁴⁴ as origin of the gods and all of the rest of the cosmos from air,⁴⁵ as astronomical and natural movements and transformations,⁴⁶ and as *μυλοειδής περιδίνησις* of the cosmos.⁴⁷ Wheelwright⁴⁸ regards rather rightly the Anaximenean theory of alteration as forerunner of the Heraclitean theory, as it declares alteration “in terms of serial order”: Everything in nature is changed as condensation or rarefaction of air: rarefaction produces fire, while condensation produces cloud, water, mud, earth, and rock; this reminds to Wheelwright of the Heraclitean “way up and way down”, suggesting that maybe the two philosophers are based on a common source for this idea of theirs. On the other hand, the concept of identity is echoed in the doxographies as identity of the air with god.⁴⁹ On the contrary, in Anaximenes I have the echo of the concept of non-identity of all the cosmos.⁵⁰

In Pythagoras and early Pythagoreanism the concept of alteration is echoed traditionally in the central doctrine of this religious-philosophical school, as movement and transformation of the soul in the cycle of its transmigration and reincarnations,⁵¹ as alteration and movement of all the cosmos,⁵² as alteration of time, the seasons from the opposites, and of the four material elements,⁵³ as earthy and astronomical movements and transformations,⁵⁴ as transformations related to medical and physiological issues,⁵⁵ and as alterations and movements that are related to the numbers and the cosmos.⁵⁶ The concept of identity is possibly echoed in number, which seems to be behind of, and to picture concrete things and concepts of the cosmos, as if it is identified with them.⁵⁷ However, on no occasion does Heraclitus borrow anything from Pythagoreanism.⁵⁸

A second presage of the Heraclitean alteration I may find in Xenophanes, where the concept of movement however is traced only as far as the cosmos and its plurality is concerned, and not for *θεός* who eternally remains unmoving and changeless, but *κραδαίνει* the cosmos, remaining paradoxically out of this cosmic motion;⁵⁹ this motion and transformation is the cyclical motion and alteration of the earth – which consists for Xenophanes the beginning and the end of the material world – and of the water, from which all things are generated and decayed.⁶⁰ Of course, the difference between Xenophanes and Heraclitus is tremendous,

since for Xenophanes god is always changeless, while for Heraclitus god is always changed as fire.⁶¹ In the doxographic tradition the concept of alteration is also echoed as astronomical and earthy natural transformations.⁶² As for the concept of identity, it is traced in Xenophanes as everlasting immobility of god and eternal stay at itself, not being identified with anything else, neither with the cosmos, nor with the becoming of the cosmos.⁶³ Here the difference between the two philosophers is immense,⁶⁴ as for Heraclitus god is in identity with itself – but also with all of the rest twelve modes of the Being –, while, on the one hand, it is simultaneously changed, and on the other hand, it is identified with the cosmos and its becoming.

Finally, the case of Parmenides as contemporary of Heraclitus is particular. Even though Parmenides is at least twenty-five years younger than Heraclitus,⁶⁵ there are scholars who believe that they knew each other.⁶⁶ On the other hand, there are some who believe that they were completely unknown to each other,⁶⁷ since they were living almost at the same time, but in regions totally opposite, one in Asia Minor and the other in Magna Graecia. There is of course the other view, like that of Cherniss,⁶⁸ who believes that Heraclitus did not know the thought of Parmenides at all, for if he knew it he would have attacked him by name first of all, as he does with other philosophers and poets,⁶⁹ while on the contrary that Parmenides knew⁷⁰ the thought of Heraclitus, making an attack to his philosophy of alteration, to which he is absolutely opposed. Nevertheless, regardless whether the two philosophers knew each other, presages of the thought of Heraclitus do not exist in Parmenides – who must rather know Heraclitus, as the opposite seems impossible, since his polemic presupposes the knowledge of Heraclitus –, who created an opposite philosophy on absolute immobility and non-alteration for the cosmic *ἔσν*,⁷¹ a 'metaphysical kingdom of justice, necessity, stability and iron control'.⁷² On the other side, on the issue of identity, Parmenides is opposed to Heraclitus as far as the identity of the opposites is concerned, differentiating completely in his dualism the basic principles of his cosmogony, day and night.⁷³ The Parmenidean rejection of any alteration and the acceptance of the absolute stability of the Being,⁷⁴ has made those who regard Parmenides as the predecessor of Heraclitus to see in the Heraclitean identity some presage of the thought of Parmenides,⁷⁵ but such a view cannot be true, since Heraclitus, firstly, precedes Parmenides, and secondly, his own identity is not stability, and

happens simultaneously with alteration, as for him the cosmos and Being is changed and identified simultaneously.⁷⁶

So, I see that the only cases where I detect a possible presage of the Heraclitean alteration is Anaximenes with the *κροια* of everything from *ἀήρ*,⁷⁷ and Xenophanes with the motion of everything from the unmoving *θεός*. However, their echo of the cosmic alteration is different⁷⁸ to the Heraclitean one, that appears that Heraclitus is really the first one who philosophises on the cosmic phenomenon of alteration to such a powerful degree⁷⁹. On the other side, as far as the identity of the cosmos is concerned, I detect a possible presage of the Heraclitean thought only in Xenophanes with the absolute immobility of *θεός* and its eternal stay at itself; it is though of very little echo and significance, showing thus as certain that Heraclitus is the first philosopher who examines the cosmic phenomenon of identity with seriousness and in the greatest degree. As Emlyn-Jones⁸⁰ mentions, with Parmenides as the sole exception, who uses the term *τῶτόν* (28B8) in order to reject the identity of the opposites, no other Presocratic philosopher attributes to the term *ἀυτός* the meaning of unity or identity.⁸¹ Hence, no other thinker, predecessor or contemporary of Heraclitus, presented, to my knowledge, a philosophy that refers to the dual theme of simultaneous cosmic and ontological alteration and identity.

III

The originality of Heraclitus in this theory of simultaneous alteration and identity of the cosmos and Being, nevertheless, does not cease only in antiquity, but continues up to our days. In the history of philosophy, this Heraclitean theory seems to be echoed again transformed in the modern and contemporary thought within the Nietzschean theory of the Eternal Recurrence of the Same,⁸² and the Heideggerean theory of Identity and Difference,⁸³ Then, it passes from the realm of philosophy into the realm of science,⁸⁴ where it is found again today in the most recent astrophysical theories, proving thus for one more time the admirable timeliness of Heraclitus.

In one of the most significant fragments of Heraclitus, fr. B30,⁸⁵ the philosopher declares that this cosmos, which no god or man has created, is in identity with itself, as it eternally is, was, and will be an ever-living fire, which is kindling and going out in cosmic measures. In this saying of the Ephesian philosopher, contemporary science is deafeningly echoed, as similar ideas on the universe are expressed

today in the most recent astrophysical theories.⁸⁶ These theories claim that the universe existed almost fifteen billion years as a mysterious and inexplicable point, which suddenly exploded, and from this vast explosion time, space, matter, antimatter, and energy were created (Theory of Big Bang). In its first period after the explosion, the first five hundred thousand years, the scientists believe that the universe was in the beginning an infinite temperature fiery and utterly luminous, but it gradually began cooling, reaching thus at its present frozen condition of -273° K, being now dark. Remains of this gigantic cosmic fire that was the universe in its beginning, are all the countless galaxies and the suns within them, but also their planets, which are frozen on the surface, but beyond are still fiery. The whole universe moves at the lightning speed of 600Km/min, being attracted towards its most densely populated from area, the Great Attractor. These theories also claim that under the dominant control of dark matter – the most enigmatic form of matter – the universe does not get only cold, but is also expanded, and that after some billion years it will rather start contracting, because it will probably have an inversion in its density and its gravity, becoming even more cool, and that it will end up after almost fifty to one hundred billion years, being then all united with the Great Attractor, in its primal condition of absolute extinction, shrinking again in a mysterious point – which is considered as a Black Hole of infinite density, gravity, and paradoxically, heat – all of its enormous space, time, matter, antimatter, and energy (Theory of Big Crush), in order then to re-explode in another new Big Bang of fire, and to become another new universe, which will be the 'same' with the previous one, but also with the next one. This process of extinction and conflagration of the 'same' universe-fire, according to science, was, is, and will be ad infinitum.

If I summarise this admirable contemporary astrophysical theory, and express it with the Heraclitean words of the wonderful fr. B30, I will not change its truth at all. The same applies to fr. B31,⁸⁷ in which Heraclitus again has rightly expressed in very general terms the material alteration of the universe, as he regards it to be an alteration of fire into air, water, and earth, and again eternally reversibly and repeatedly. Thus, it echoes almost the sasimilar discoveries of contemporary science on how the universe changes: in the beginning it was fiery, then enormous masses of air were produced, which were gradually liquefied, and at the end, were solidified. The bodies that exist in the universe as a result of this eternal material alteration of fire from-and-to itself, are some in fiery

condition (suns, galaxies, the inside of the planets), other in aerial condition (nebulas, planets), other in liquid condition (planets), and some in solid condition (celestial bodies, planets, moons), verifying thus the Heraclitean theory of alteration of the cosmos, and lending to it an immense timeliness. But the Heraclitean theory of identity has also timeliness because it is also verified by the contemporary theories on the universe. The universe, regardless of how it changes, it is always the 'same' universe, one, same, and common, since from its beginning in every Big Bang, until its shrinking again to its primal point in every Big Crush. After an enormous and immense alteration, it is identified again with its 'same' self, in order to re-explode and to change again always to its 'same' self, since it is in eternal identity with itself. All the more so, the matter with the antimatter of the universe is considered to be in identity by scientists, verifying thus also the theory of the identity of the opposites of Heraclitus. According to contemporary science, then, the alteration and the identity of the universe is eternally happening, being the eternal recurrence (hence, alteration) of the 'same' universe (hence, identity).

Conclusively, Heraclitus is the first philosopher who conceived only through his mind whatever contemporary science teaches today with the most advanced scientific and technological means that it possesses.⁸⁸ This timeliness of Heraclitus, hence, is more than admirable. And for this reason, the Heraclitean theory of the eternal alteration and identity of the cosmos and Being is not played out, and it is not interesting only from the historical view or only for research itself, but it is a timely theme, which lives still today in the most contemporary astrophysical theories, attempting to give an answer on the universe-cosmos, being timely, exactly because it is true.⁸⁹

Notes

1. The demonstration of this changing and simultaneously identified idiosyncratic nature of Being and the cosmos, according to Heraclitus, constitutes the original thematology and problem of my Doctoral Dissertation: Yiorgo N. Maniatis: *Alteration and Identity in the Philosophy of Heraclitus* (University of Athens, 1999, in Greek; forthcoming).
2. For the cosmological alteration of the world in Heraclitus see in H. Diels – W. Kranz: *Die Fragmente der Vorsokratiker* (Berlin, 1952, Sechsten Auflage, 3 Bände): the alteration of the world as ποταμὸς in 22B12, B49a, B91, the alteration of the world as κυκεὼν in B125, and the two causes of the cosmic alteration, first, time-ὄραι in B100, and second, tiredness-κάματος in B84a,b.
3. See 22B10: καὶ ἐκ πάντων ἐν καὶ ἐξ ἐνὸς πάντα.
4. See 22B50: ἐν πάντα εἶναι.
5. For the cosmological identity of the world in Heraclitus see: the identity of the world as κόσμον τόνδε, τὸν αὐτὸν ἀπάντων in 22B30, the identity of the world as ποταμὸς(-μοῖς) αὐτοῖσιν, αὐτοῖς, αὐτῶι in B12, B49a, B91, and the identity of the world as κυκεὼν in B125.
6. Being, according to Heraclitus, has the following multiple modes: πῦρ (B30, B90), λόγος (B1, B2, B72), θεός (B32, B67, B114), ἔρις (B8, B80), δίκη (B28, B80, B94, B102), πόλεμος (B53, B80), αἰὼν (B52), σοφόν (B32, B41, B50), χρησιμοσύνη or χρεὼ καὶ κόρος (B65, B80), κεραυνός (B64), νόμος (B114), γνώμη (B41).
7. For the ontological alteration of the modes of Being in Heraclitus see: the alteration of πῦρ in 22B30: πῦρ αἰείζων, ἀπτόμενον μέτρα καὶ ἀποσβεννύμενον μέτρα, B31: πυρὸς τροπαὶ πρῶτον θάλασσα, θαλάσσης δὲ τὸ μὲν ἥμισυ γῆ, τὸ δὲ ἥμισυ πρηστήρ, B90: πυρὸς τε ἀνταμοιβῆ τὰ πάντα καὶ πῦρ ἀπάντων, B76: the cyclical alteration of πῦρ into-and-from ἀήρ-ῥόδωρ-γῆ, and the alteration of θεός in B67: ὁ θεός... ἀλλοιοῦται δὲ δκωσπερ <πῦρ>.
8. See the cosmological identity of the world as εἷς καὶ κοινὸς κόσμος, τὸν αὐτὸν ἀπάντων, and τοῖς αὐτοῖς in 22B89, B30, B84b.
9. For the ontological identity of the thirteen modes of Being in Heraclitus see: the identity of πῦρ-λόγος-θεός-Κεραυνός-χρησιμοσύνη καὶ κόρος in 22B31, B64, B65, the identity of λόγος-αἰὼν in B50, the identity of θεός-πόλεμος-κόρος-πῦρ-δίκη-νόμος-Ζεὺς-σοφὸν-γνώμη in B67, B102, B114, B32, B41, B78, the identity of ἔρις-δίκη-χρεὼ-πόλεμος in B80, and the identity of πόλεμος-αἰὼν in B52, B53.
10. F.M. Cornford: *From Religion to Philosophy. A Study in the Origins of Western Speculation* (London: E. Arnold, 1912; Princeton University Press, 1991), 1ff.; also: *Principium Sapientiae: the Origins of Greek Philosophical Thought* (Cambridge University Press, 1952).
11. K.R. Popper: 'Back to the Presocratics', *Proceedings of the Aristotelian Society* 59, 1958/9, 1-24; also in *Studies in Presocratic Philosophy*, (eds.) D.J. Furley and R.E. Allen (London: Routledge and Kegan Paul, 1970, vol. I), 130-153, rightly considers the opposite, that Presocratic philosophy begins the 'scientific' discovery, which starts not from observation or experiment, but through 'cosmological' theories and insights, which are the most significant in the realm of science. Popper regards that the traditional, empirical, epistemological view that all science begins from observation and experiment and it is then developed into theory, is an outcome of the myth that Bacon started. And he sets off as a resounding proof against this view the Presocratics and their great scientific, cosmological discoveries, which started as theories-meditations, and not as experiments.

12. W. Jaeger: *Paideia: the Ideals of Greek Culture* (New York, 1943, vol. I).
13. J. Burnet: *Early Greek Philosophy* (1892; London, 1930, 4th ed.), 24ff.
14. B. Helm: 'Social Roots of the Heraclitean Metaphysics', *Journal of the History of Ideas* 25, 1964, 565-571.
15. See 22B14, B42, B56, B57, B68.
16. J.P. Vernant: *The Origins of Greek Thought* (Ithaca, N.Y.: Cornell University Press, 1982), 130-132, does not accept as 'scientific' in today's standards early philosophical thought, but does not equate it with mythical thought, but with political thought.
17. C.H. Kahn: *The Art and Thought of Heraclitus* (Cambridge: Cambridge University Press, 1979), 9ff.
18. See 22B8, B15, B23, B28, B32, B80, B94, B98, B102, B120.
19. For Heraclitus' loans from the tradition and his transcendences of the tradition, see also C.H. Kahn, *op. cit.*, 9-16.
20. G. Vlastos: 'On Heraclitus', *American Journal of Philology* 76, 1955; also in *Studies in Presocratic Philosophy*, (eds.) D.J. Furley and R.E. Allen (London: Routledge and Kegan Paul, 1970, vol. I), 415-429, finds presages of the Heraclitean thought only in Anaximander and Anaximenes, in the following issues: (1) in $\delta\acute{\iota}\kappa\eta$ and $\xi\rho\acute{\iota}\varsigma$, (2) in the infinity of the cosmos, (3) in the denial of the infinity of $\pi\theta\acute{o}$, unlike Anaximander and Anaximenes, and (4) in the unity of the many and the identity of the opposites, emanating from Anaximenes, but significantly transformed, since it does not concern only the air. However, he recognises that the differences between them are tremendous. On the contrary, W.K.C. Guthrie: *A History of Greek Philosophy* (Cambridge: Cambridge University Press, 1962, vol. I), 415-416, claims that Heraclitus does not have any relationship with any Presocratic, regarding every attempt of correlation of his so much distant and derisive for everyone – both people and philosophers – thought as wrong. I find Guthrie's claim to be right.
21. K.R. Popper, *op. cit.*, 138ff.; see also: *The Open Society and its Enemies* (London: Routledge, 1966, vol. I), chap. 2, considers Heraclitus the philosopher who discovered the idea of *change*, the magnitude of which is extreme. He regards the "general problem of change" as the central problem of all ancient Greek cosmology, which started with simple hints from Anaximander with reference to the astronomical changes, took its basic great dimension in Heraclitus, was doubted 'logically' by the Eleatics Parmenides and Zeno, and then was led by the Atomists Leucippus and Democritus, who reversed the Eleatics, to "a general theory of change" – the theory that: "all change, and especially all qualitative change, has to be explained by the spatial movement of unchanging bits of matter – by atoms moving in the void" –, which was then adopted by modern science up to the twentieth century, to be replaced later by Maxwell, who developed the ideas of Faraday, to "a theory of changing intensities of fields". For the magnitude of the Heraclitean theory of alteration and its results, which resemble 'an earthquake where everything seems to move', cf. W. Nestle: *Die Vorsokratiker* (Jena, 1908), 35.
22. Socrates, according to Plato, *Theaetetus* 152d, 179d, claims that the Heraclitean doctrine of flux has Homer as its forerunner, who regarded as the origin of all things the water-gods Oceanus and Tethys, and that all the Presocratics, besides Parmenides, consider that the constitution of all things comes from motion. W.K.C. Guthrie, *op. cit.*, 410n.1, regards that here Socrates is just humorous, and that this does not eliminate the seriousness ascribed to Heraclitus as the pioneer of the theory of alteration. Some of the scholars who accept the Heraclitean theory of alteration, nevertheless, think that it is not particularly original, since similar views have been expressed by the Milesians before Heraclitus. However, as J. Barnes: *The Presocratic Philosophers* (London: Routledge

and Kegan Paul, 1979), 65, says, it is another thing to say that things change, and a different thing that 'everything changes', and all the more so, 'always'. Also, the Milesians believed in many stable and permanent things in the cosmos. For more on the concept of alteration in the Presocratics, see W.A. Heidel: 'Qualitative Change in Pre-Socratic Philosophy', *Archiv für Geschichte der Philosophie* 19, 1906, 333-379; also in *The Pre-Socratics*, (ed.) A.P.D. Mourelatos, (Garden City, N.Y.: Anchor Press, 1974; Princeton: Princeton University Press, 1993), 86-95. G.S. Kirk: 'Natural Change in Heraclitus', *Mind* 60, 1951; also in *The Pre-Socratics*, (ed.) A.P.D. Mourelatos, (Garden City, N.Y.: Anchor Press, 1974; Princeton: Princeton University Press, 1993), 192, believes that change as an idea exists everywhere in early Greek thought, but totally unformed yet, probably because the Milesians took it for granted, without giving to it a formal explanation as Heraclitus did. Cf. C.H. Kahn, *op. cit.*, 16-23, who considers the Ionian theory of alteration as interchange between the opposite cosmic masses and elements, within a periodical symmetry which is recognised as just, a theory that Heraclitus approves of, but expands in the whole universe.

23. Cf. G.S. Kirk: *Heraclitus: The Cosmic Fragments* (Cambridge: Cambridge University Press, 1954), 402; also, *op. cit.*, 192, who differentiates the unity of the Pre-Heracliteans from the unity of Heraclitus, because it is connected with their one element-Being, and it is not in an explanatory relationship with alteration, as in Heraclitus; also G.S. Kirk, J.E. Raven, and M. Schofield: *The Presocratic Philosophers* (Cambridge: Cambridge University Press, 1957, 1983), 212, who believe that the Heraclitean theory of unity "seems completely new" in the history of philosophy (mainly also because of the lack of information about Anaximander). Cf. also C.H. Kahn, *op. cit.*, 16-23; C.J. Emlyn-Jones: 'Heraclitus and the Identity of Opposites', *Phronesis* 21, 1976, 110; G. Vlastos, *op. cit.*, 427-428.

24. See 22B50.

25. See 11B3.

26. See 11A1, A12.

27. See 11A1, A2, A3, A5, A16, A17, A17a.

28. See 11A12, A13, A13a, A23.

29. See 11A12, A13, A14.

30. See 11A22, A22a.

31. See 11A12.

32. See 11A1.

33. See 11A1, A23.

34. P. Wheelwright: *Heraclitus* (Princeton: Princeton University Press, 1959), 4.

35. See 12A1.

36. See 12A9, A9a.

37. See 12A10, A11, A14, A15, A17.

38. See 12A1, A2, A4, A11, A21, A22, B4, A10, A23, A24, A30, A12, A27, A26.

39. P. Wheelwright, *op. cit.*, 5-6.

40. See 12B3; cf. A15.

41. See 12A17.

42. See 12A9, A16.

43. See 13B3, Olympiodorus, *De arte sacra lapidis philosophorum* c. 25: 'ἐγγύς ἐστὶν ὁ ἀῆρ τοῦ ἀσωμάτου καὶ ὅτι κατ' ἔκρωσιαν τούτου γινόμεθα, ἀνάγκη αὐτὸν καὶ ἀπειρον εἶναι καὶ πλούσιον διὰ τὸ μηδέποτε ἐκλείπειν'.

44. See 13B1, B2, A5, A8, A6, A7, A11.

45. See 13A7.

46. See 13A1, A6, A13, A14, A15, A16, A17, A18, A19, A21.
 47. See 13A12.
 48. P. Wheelwright, *op. cit.*, 6.
 49. See 13A10.
 50. See 13A11.
 51. See 14 (1, 8, 8a), 19 (2), 21B7, 24 (A1, A12), 58 (B1a, B40).
 52. See 18 (1, 7).
 53. See 58 (B1a, B33, B34).
 54. See 58 (B36, B37), 24A4.
 55. See 14 (7), 19 (3), 24 (A5, A18), 58B1a.
 56. See 58 (B5, B8, B2, B22), 18 (13).
 57. See 58 (B1a, B4, B5, B8, B34).
 58. The view that Heraclitus was a pupil of the Pythagorean Hippasus of Metapontum, and that they both had had the theory of alteration for $\pi\theta\theta$ (see 22A5: Theophrastus, Aristotle, Simplicius) is unfounded and doxographical; cf. P. Wheelwright, *op. cit.*, 8-9. See also G. Vlastos, *op. cit.*, 416n.3, with relative analysis of the terms $\acute{\alpha}\lambda\lambda\alpha\iota\sigma\mu\acute{o}\varsigma$ and $\acute{\alpha}\lambda\lambda\alpha\iota\sigma\mu\acute{o}\varsigma$ as possibly originated by Pythagoras, with the conclusion that they do not originate from him. Cf. G.S. Kirk, *op. cit.*, 403; H. Fraenkel: *American Journal of Philology* LIX, 1938, 309ff.; E.L. Minar: 'The Logos of Heraclitus', *Classical Philology*, 1939, 338ff.
 59. See 21B25, Simplicius, *Physics* 23, 19: $\acute{\alpha}\lambda\lambda\prime \acute{\alpha}\pi\acute{\alpha}\nu\epsilon\upsilon\theta\epsilon \pi\acute{o}\nu\omicron\iota\omicron \nu\acute{o}\sigma\upsilon \varphi\rho\epsilon\acute{\nu}\iota \pi\acute{\alpha}\nu\tau\alpha \kappa\rho\alpha\delta\alpha\acute{\iota}\nu\epsilon\iota$ [mean. $\acute{o} \theta\epsilon\acute{o}\varsigma$]; 21B26, Simplicius, *Physics* 23, 10: [mean. $\acute{o} \theta\epsilon\acute{o}\varsigma$] $\acute{\alpha}\iota\epsilon\acute{\iota} \delta\prime \acute{\epsilon}\nu \tau\acute{\alpha}\upsilon\tau\omega\iota \mu\acute{\iota}\nu\epsilon\iota \kappa\iota\nu\acute{o}\upsilon\mu\epsilon\mu\omicron\varsigma \sigma\acute{\upsilon}\delta\acute{\epsilon}\nu \mid \sigma\acute{\upsilon}\delta\acute{\epsilon} \mu\epsilon\tau\acute{\epsilon}\rho\chi\epsilon\sigma\theta\acute{\alpha}\iota \mu\iota\nu \acute{\epsilon}\pi\iota\pi\rho\acute{\epsilon}\pi\epsilon\iota \acute{\alpha}\lambda\lambda\omicron\tau\epsilon \acute{\alpha}\lambda\lambda\eta\iota$. For the immobility and changeless of god, cf. 21A33, A35, A36, A49; for the paradox of Xenophanes on the changeless god and the dual cause of its motion and immobility, cf. 21A28, A31.
 60. See 21B27, B29, B30, B33; cf. A33, A32, A36.
 61. See 22B67: $\acute{o} \theta\epsilon\acute{o}\varsigma\dots \acute{\alpha}\lambda\lambda\omicron\iota\omicron\upsilon\tau\alpha\iota \delta\acute{\epsilon} \delta\kappa\omega\sigma\pi\epsilon\rho <\pi\theta\theta>$.
 62. See 21A1, A32, A38, A39, A40, A41, A41a, A42, A43, A44, A45, A46, A47, A48.
 63. See 21B26, Simplicius, *Physics* 23, 10: [mean. $\acute{o} \theta\epsilon\acute{o}\varsigma$] $\acute{\alpha}\iota\epsilon\acute{\iota} \delta\prime \acute{\epsilon}\nu \tau\acute{\alpha}\upsilon\tau\omega\iota \mu\acute{\iota}\nu\epsilon\iota \kappa\iota\nu\acute{o}\upsilon\mu\epsilon\mu\omicron\varsigma \sigma\acute{\upsilon}\delta\acute{\epsilon}\nu \mid \sigma\acute{\upsilon}\delta\acute{\epsilon} \mu\epsilon\tau\acute{\epsilon}\rho\chi\epsilon\sigma\theta\acute{\alpha}\iota \mu\iota\nu \acute{\epsilon}\pi\iota\pi\rho\acute{\epsilon}\pi\epsilon\iota \acute{\alpha}\lambda\lambda\omicron\tau\epsilon \acute{\alpha}\lambda\lambda\eta\iota$. Cf. A35, A33, A32, A36, A37, A28, A31. W.K.C. Guthrie, *op. cit.*, 381, vainly attempts to show the identity of god-cosmos in Xenophanes.
 64. O. Gigon: *Untersuchungen zu Heraklit* (Basel Dissertation, Leipzig, 1935) tries in his doctoral dissertation to link Heraclitus with Xenophanes, but as G. Vlastos, *op. cit.*, 415ff., says, he "sheds some light on Heraclitus' religious views but almost none on his cosmological and metaphysical conceptions". Cf. W. Broecker: *Gnomon* XIII, 1937, 530ff.; W.K.C. Guthrie, *op. cit.*, 415-416.
 65. See G.S. Kirk, *op. cit.*, 3; G.S. Kirk, J.E. Raven, and M. Schofield, *op. cit.*, 182; W.K.C. Guthrie, *op. cit.*, 408; F.M. Cleve: *The Giants of Pre-Sophistic Greek Philosophy* (The Hague, 1969, vol. 1), 32; C.J. De Vogel: *Greek Philosophy* (Leiden: E.J. Brill, 1950, vol. I), 23.
 66. See K. Reinhardt: *Parmenides und die Geschichte der griechischen Philosophie* (Bonn, 1916), 64ff., 155ff., 221ff., and Abel Rey: *La Jeunesse de la Science Grecque*, 185, who consider Parmenides older than Heraclitus, and that Heraclitus knew his philosophy and influenced by it. This incorrect view has resulted: (a) from a testimony of Eusebius, 81.1-3, who puts the prime of Heraclitus fifty years later, making him contemporary of Zeno, Parmenides' pupil; and (b) from Plato, *Sophist* 242d, who refers to the Ionian and Sicilian muses, but also by his dialogue *Parmenides*, where the young Socrates discusses with Parmenides, who is old, that is, close to the age of Heraclitus, since Socrates was born in 469 B.C.

67. See O. Gigon: *Der Ursprung der griechischen Philosophie* (Basel, 1945), 245; W. Jaeger: *The Theology of the Early Greek Philosophers* (Oxford, 1967), 101, 123, n.54; F.M. Cleve, *op. cit.*, 32n.1.
68. H. Cherniss: *Aristotle's Criticism of Presocratic Philosophy* (Baltimore: The Johns Hopkins University Press, 1935), 383; also: 'Characteristics and Effects of Presocratic Philosophy', *Journal of the History of Ideas* 12, 1951, 319-345; also in *Studies in Presocratic Philosophy*, (eds.) D.J. Furley and R.E. Allen (London: Routledge and Kegan Paul, 1970, vol. 1), 19-22, n.89. Cf. E. Loew: 'Das Lehrgedicht des Parmenides eine Kampfschrift gegen die Lehre Heraklits', *Rheinisches Museum* 79, 1930, 209-211; W. Kranz: 'Vorsokratisches I', *Hermes* 69, 1934, 117-118.
69. See the obvious attack of Heraclitus on Pythagoras, Xenophanes, Homer, Archilochus, Hesiod, and Hecataeus in fr. 22B40, B42, B56, B57, B81, B106, B129, A23.
70. Among the scholars of the nineteenth century, Bernays, Schuster, Steinhart, Patin, and J. Burnet, *op. cit.*, 130, regarded the Parmenidean fr. 28B6 as an attack to Heraclitus. E. Zeller: *Die Philosophie der Griechen in ihrer geschichtlichen Entwicklung* I, II, ed. W. Nestle (Leipzig: Reissland, 1920, 6th ed.); in English: *Outlines of the History of Greek Philosophy*, rev. W. Nestle, trans. L.R. Palmer (New York: Dover, 1980), 926; K. Reinhardt, *op. cit.*, 155ff.; and O. Gigon, *op. cit.*, 33, believe the opposite. W.K.C. Guthrie, *op. cit.*, 408, n.2, thinks that at least one of the fragments 28B6.8-10, 28B8.57-58, 28B4.3-4, must be an attack against Heraclitus. Cf. W. Kranz, *op. cit.*, 117; G. Vlastos, *op. cit.*, 341, n.11. H.W.Jr. Johnstone: *Heraclitus' Περί Φύσεως* (Pennsylvania: Bryn Mawr College, 1984), v, 13, claims that Heraclitus did not know Parmenides, and that Parmenides probably knew Heraclitus, because he ridicules the Heraclitean word *παλίντροπος* (B51) in his fr. 28B6.9; see the same opinion in C.J. De Vogel, *op. cit.*, 23.
71. See 28B6, B7, B8. In Parmenides, becoming is absent, while Being uniquely excels. As W.A. Heidel, *op. cit.*, 94, mentions, the only phrase in which Parmenides refers to alteration is in fr. B8.41: *διὰ τε χροῶα φανὸν ἀμειβεῖν*, to express though the change of color. See also E. Hussey: *The Presocratics* (London: Duckworth, 1972), 87-88, on the view that Parmenides rejects the theory of alteration mainly as a reaction against Heraclitus, whom he probably knew. Cf. Melissus, 30B8, who rejects the alteration of the opposites, in order to support the Eleatic idea of permanent reality.
72. See Th. Veikos: *The Presocratics* (Athens: I. Zacharopoulos, 1988), 189.
73. See 28B8.29, 57-58: *ταῦτόν τ' ἐν ταῦτάωι τε μένον καθ' ἑαυτό τε κείται ...ἔωντάωι πάντοσε τωῦτόν, τῶι δ' ἐτέρωι μὴ τωῦτόν*, where each opposite is 'self-existent and self-evident'.
74. K. Popper, *op. cit.*, 139, regards that the "general problem of change...in the hands of Parmenides and Zeno it almost turns into a logical one", which asks: 'how is change logically possible?' "How can a thing change, without losing its identity? If it remains the same, it does not change; yet if it loses its identity, then it is no longer that which has changed".
75. See K. Reinhardt, *op. cit.*, 206-207; also: 'Herakleitos Lehre vom Feuer', *Hermes* 77, 1942, 18; B. Snell: 'Die Sprache Heraklits', *Hermes* 61, 1926, 353-381; P. Schuster: *Heraklit von Ephesus* (Leipzig, 1873), 201ff. Cf. H. Cherniss, *op. cit.*, 382-384; also, *op. cit.*, 21-22; H. Fraenkel: *Parmenidesstudien*, 159-169. M. Sauvage: *Parménide*, 39, holds the view that the terms of Being and becoming exist in both Heraclitus, who accepts motion, and in Parmenides, who accepts immobility. However, even though this is true for Heraclitus, whose Being is 'in becoming', since it is constantly changing, this

is not true for Parmenides, who totally rejects the changing becoming for the eternal immobility of his Being.

76. See more on the problem of similarity between Heraclitus-Parmenides on 'alteration and identity', in the beginning of the First and Second Parts of my Doctoral Dissertation, Y. N. Maniatis, *op. cit.* As F.M. Hetzler: 'Heraclitus: Neglected Star of Ionian Philosophy in Greek Ephesus', *Ionian Philosophy*, (ed.) K.J. Boudouris (Athens, 1989), 182, says, "The unity of "is" for Parmenides becomes the unity of the "is" of change for Heraclitus". And W. Jaeger, *op. cit.*, 101, 123, n.54, believes that Heraclitus finds unity even in alteration, without constructing a Parmenidean changeless Being. M.C. Stokes: *One and Many in Presocratic Philosophy* (Washington, DC, 1971), 86, also thinks that the Heraclitean theory of stability within alteration is constructed in such a way, that it is obvious that Heraclitus does not have any relationship with Parmenides, against Reinhardt' s view.

77. M.L. West: *Early Greek Philosophy and the Orient* (Oxford: Clarendon Press, 1971), 129ff., regards as incorrect the Theophrastean attribution of the Anaximenean theory of alteration in Heraclitus – see Diogenes Laertius IX 8-9; Aetius I.3.11; Simplicius, *Physics* 23.33ff.; cf. J.B. McDiarmid: *Harvard Studies* 61, 1953, 94ff. –, because Heraclitus was not thinking of fire as Anaximenes of air, that it was condensed and rarefied, but as a process of alteration into the other cosmic elements.

78. For the difference between Heraclitus and the Milesian thought on the subject 'alteration and identity', and for his innovation in this theory, see also K. Popper, *op. cit.*, 140ff.; also: *op. cit.*, 48ff., 329n.2; H. Cherniss, *op. cit.*, 14ff.; G.S. Kirk, *op. cit.*, 192.

79. F.W. Nietzsche: *Philosophy in the Tragic Age of the Greeks*, trans. M. Cowan (Washington, DC: Gateway, 1962), 50, believes that Heraclitus says: "'Becoming' is what I contemplate... and no one else has watched so attentively this everlasting wavebeat and rhythm of things". K. Popper, *op. cit.*, 140ff.; also, *op. cit.*, chap. 2n.2, says: "The three Milesians all looked on our world as our home. There was movement, there was change in this home, there was hot and cold, fire and moisture. There was a fire in the hearth, and on it a kettle with water. The house was exposed to the winds, and a bit draughty, to be sure; but it was home, and it meant security and stability of a sort. But for Heraclitus the house was on fire. There was no stability left in the world of Heraclitus. 'Everything is in flux, and nothing is at rest'... Heraclitus' philosophy... created two new problems – *the problem of change and the problem of knowledge*... But this, I believe, is due to the fact that he saw more clearly than his predecessors the difficulties that were involved in the very idea of change". To those who consider, agreeing with J. Burnet, *op. cit.*, 146ff., that the theory of change was conceived by his predecessors, Popper answers that they do not understand the major idea of Heraclitus after 2400 years, for they cannot distinguish the difference between the flux or recycling within an 'edifice' or a 'whole of things' (Milesians), 'and a universal flux that covers everything' (Heraclitus). C.I. Smith: 'Heraclitus and Fire', *Journal of the History of Ideas* 27, 1966, 125-127, also regards rightly believes that, "Heraclitus' philosophy is that of change, of universal flux; nothing is at rest. That is to say, against the earlier Greek philosophers' idea of the world as an edifice, Heraclitus propounds the idea of the world as a process". For Heraclitus as "the apostle of impermanence and flux", cf. G.S. Kirk: 'Sense and Common Sense in the Development of Greek Philosophy', *Journal of Hellenic Studies* 81, 1961, 108-110, who obviously contradicts himself when he regards that Heraclitus thinks only of the permanence and unity that hides behind alteration. Cf. G.S. Kirk, J.E. Raven, and M. Schofield, *op. cit.*, 186.

80. See C.J. Emlyn-Jones, *op. cit.*, 95.

81. See H. Diels - W. Kranz, *op. cit.*, III Band, 85-86: *αὐτός* (Identität); H.G. Liddell and R. Scott: *A Greek-English Lexicon*, revised by H. Stuart Jones and R. McKenzie (1925-1940, 9th ed.), I, 11.
82. See F.W. Nietzsche: *The Gay Science*, tran. W. Kaufmann (New York: Vintage, 1974), n. 341, 285, 233, 109; *Thus Spoke Zarathustra*, tran. R.J. Hollingdale (London: Penguin, 1961), 'Of the Vision and the Riddle', 176-180; 'The Convalescent', 232-238; *Ecce Homo*, tran. R.J. Hollingdale (London: Penguin, 1979), 99; *The Will to Power*, tran. W. Kaufmann and R.J. Hollingdale, ed. W. Kaufmann (New York: Vintage, 1968), n. 55, 417, 462, 617, 1041, 1050, 1053-1067.
83. See M. Heidegger: *Identity and Difference*, tran. J. Stambaugh (New York: Harper & Row, 1969).
84. For a similar view, but concerning all the Presocratics, see F.M. Hetzler, *op. cit.*, 178-185.
85. 22B30, Clement, *Stromateis* V 105 (II 396, 10) [Plutarch, *De anim.* 5 p. 1014A]: *κόσμον τόνδε, τὸν αὐτὸν ἀπάντων, οὔτε τις θεῶν οὔτε ἀνθρώπων ἐποίησεν, ἀλλ' ἦν ἀεὶ καὶ ἔστιν καὶ ἔσται πῦρ ἀείζων, ἀπτόμενον μέτρα καὶ ἀποσβεννύμενον μέτρα.*
86. See A. Einstein: *Relativity: The Special and General Theory* (New York: Crown, 1961); M. Gardner: *The Relativity Explosion* (New York: Vintage, 1976); A.H. Guth and P.J. Steinhardt: 'The Inflationary Universe', *Scientific American* 250 (5), 90, 1984; S.W. Hawking: *A Brief History of Time: From the Big Bang to Black Holes* (New York: Bantam Books, 1988); N.D. Mermin: *Space and Time in Special Relativity* (New York: Mc Graw-Hill, 1968); D.W. Sciama: *Modern Cosmology* (Cambridge University Press, 1971); R.M. Wald: *Space, Time, and Gravity: The Theory of the Big Bang and Black Holes* (University of Chicago Press, 1977); S. Weinberg: *The First Three Minutes: A Modern View of the Origin of the Universe* (New York: Basic Books, 1977).
87. 22B31, Clement, *Stromateis* V 105 (II 396, 13): *ὅτι δὲ καὶ γενητὸν καὶ φθαρτὸν εἶναι ἔδογάτιζεν, μηνύει τὰ ἐπιφερόμενα πυρὸς τροπαὶ πρῶτον θάλασσα, θαλάσσης δὲ τὸ μὲν ἥμισυ γῆ, τὸ δὲ ἥμισυ πρηστήρ. δυνάμει γὰρ λέγει ὅτι τὸ πῦρ ὑπὸ τοῦ διοικούντος λόγου καὶ θεοῦ τὰ σύμπαντα δι' ἀέρος τρέπεται εἰς ὕγρὸν τὸ ὡς σπέρμα τῆς διακοσμήσεως, ὃ καλεῖ θάλασσαν, ἐκ δὲ τούτου αὐθις γίνεται γῆ καὶ οὐρανὸς καὶ τὰ ἐμπεριεχόμενα. ὅπως δὲ πάλιν ἀναλαμβάνεται καὶ ἐκπυροῦται, σαφῶς διὰ τούτων δηλοῦ <γῆ> θάλασσα διαχέεται, καὶ μετρέεται εἰς τὸν αὐτὸν λόγον, ὁκοῖος πρόσθεν ἦν ἢ γενέσθαι γῆ.*
88. For the same remark, cf. F.M. Cornford: 'Mystery Religions and Presocratic Philosophy', *Cambridge Ancient History* 4, 1926, 558.
89. As F.W. Nietzsche, *op. cit.*, 68, says: "For the world forever needs the truth, hence the world forever needs Heraclitus". Cf. C.H. Kahn, *op. cit.*, ix, who thinks that maybe Heraclitus is the only one of the Presocratics whose interest is more than historical today.