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Edited by Malcolm Schofield and Martha Craven Nussbaum

Excerpt

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1 Heraclitus' conceptions of flux, fire and material persistence

DAVID WIGGINS

Even when they are most worthy of amazement, things of daily occurrence pass us by unnoticed.

Seneca, *Quaestiones Naturales* 7.1.1

It can be hardly be supposed that a false theory would explain in so satisfactory a manner as does the theory of natural selection the several large classes of fact above specified. It has recently been argued that this is an unsafe method of arguing; but it is a method used in judging of the common events of life and has often been used by the greatest natural philosophers.

Charles Darwin, *Origin of Species*

1 *Heraclitus and the Milesians*

1.1 In recent decades there has been a tendency among scholars to question whether Heraclitus was, in the same sense as the Milesians were, a *cosmologist*: '[Heraclitus'] real subject is not the physical world but the human condition, which for the Greeks means the condition of mortality . . . Like [his] substitution of Fire for [Anaximenes'] Air, any changes in detail must have been designed not to improve the physical scheme in a scientific sense but to render its symbolic function more drastic.'¹

¹ Charles Kahn 'A New Look at Heraclitus', *American Philosophical Quarterly*, 1 (1964), 189–203. It would be wrong for me not to qualify the disagreement I shall note in the text by the acknowledgment of how much I have found both to agree with and to admire on the subject of Heraclitus in Kahn's book *Anaximander and the Origin of Greek Cosmology* (New York and London 1960), esp. 187–97.

Kahn's new book, *The Art and Thought of Heraclitus* (Cambridge 1979), came to hand as this essay was reaching its penultimate draft; but it has enabled me to make a number of improvements in detail. I have also taken over from Kahn the felicitous (and felicitously ambiguous) expression 'elemental form'. Since Kahn's new book is not a repudiation of the doctrine I have quoted from his 1964 article, I have ventured to let section 1.1 of this essay remain as it was before I saw the new book.

I seize the first opportunity to thank the editors and Edward Hussey and Richard Sorabji most sincerely for the efforts that each of them has made at various stages to save me from the errors born of amateurish enthusiasm. I wish I could now blame them for every howler that remains.

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It would be foolish to deny that problems about mortality, fallibility and the human perspective were an important part of Heraclitus' main subject. But this is not inconsistent with his having seen himself as answerable in the first instance to the same questions as the Milesians, whatever his reservations about their would-be *polymathīē*:

One thing is wisdom: to understand the plan by which all things are steered through all things (B41).

One from all and all from one (B10).

It is wise to hearken not to me but to my *logos* and to confess that all things are one (B50).

Thales, Anaximander and Anaximenes had been concerned not only with particular phenomena that aroused their curiosity but also with the description and explanation of the world as a whole: How did the world come to exist and to be what it is? And now that it does exist, what sort of thing is it, and how does it maintain itself? Heraclitus inherited these questions from the Milesians, and he asked others of his own, about the soul, and about human destiny, cognition and language. I shall contend that the new problems were seen by Heraclitus as requiring an unconditional willingness on his part to attempt some better than merely symbolic response to those of the Milesians. Indeed, if the reading that I shall propose for certain passages is accepted, then it will appear that he saw himself as positively obliged to improve upon his predecessors' cosmological theories.

1.2 There is a second affinity I claim to find between Heraclitus and the Milesians. If we are to trace any pattern in the doctrines that have come down to us as his, we need to see him as exploiting just as recklessly as his Milesian predecessors did what is sometimes called the Argument to the Best Explanation:² If *q* is the best explanation why *p* holds, then, if *p* is true, *q* must be true too.³

Whatever G. E. L. Owen may make of the ascription of the method to Heraclitus, it is he who must bear some considerable

2 See Gilbert Harman, 'The Inference to the Best Explanation', *Philosophical Review*, 74 (1965), 88–95; Paul R. Thagard, 'The Best Explanation: Criteria for Theory Choice', *The Journal of Philosophy*, 75 (1978), 76–92, to whom I am indebted for the initial quotation from Darwin. Thagard mentions the Peircean and Leibnizian parallels. There is also an interesting affinity waiting to be drawn out with Collingwood's doctrine that 'questions are the cutting edge of the mind'

3 The 'must' has 'if *p* then *q*' as its scope here; and of course it does not connote the metaphysical necessity of *q*.

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part of any blame or credit that it provokes. For it is one of Owen's contributions to our understanding of Greek philosophy to have drawn attention to the central part (insufficiently remarked in modern times) that is played in Greek thought by the idea of Sufficient Reason.⁴ Owen has traced the idea from Leucippus, Parmenides and Melissus⁵ back to Anaximander, where Anaximander's mastery of Sufficient Reason is brilliantly demonstrated by his replacement of Thales' supposition that water is what holds the world up by the insight (cf. Aristotle, *de Caelo* 295b11) that the earth is held up by nothing and simply stays where it is because it is in equipoise with other things, there being no reason for its shifting in any particular direction.

What is the connection between Sufficient Reason and the Argument to the Best Explanation? Suppose nothing holds true unless there is reason for its so holding. Then if p is true, something must be true which explains why p is true. But then it must be possible to argue backwards – albeit against the direction of implication – and infer from p 's truth whatever best explains why p . The Principle of Sufficient Reason gives us the Argument to the Best Explanation⁶ then, and in doing this it suggests a research strategy – the same strategy which Charles Darwin seeks to justify in the passage of *Origin of Species* prefixed to this essay. Any phenomenon that is observed calls for explanation. But, wherever explanation is called for, one should postulate as true that which best explains the phenomenon, regardless of whether the putatively explanatory fact is in any way directly observable. Improving and amplifying the precept a little, it is natural to expand upon it as Plato did: when we have several explanations of distinct phenomena arrived at in this manner, we must test our explanations and the consequences of our explanations for consistency with one another and with everything else we believe.

4 See, for instance, 'Plato & Parmenides on the Timeless Present', *The Monist*, 50 (1966), 317–40. I understand that Owen has developed the theme further in his Sather Classical Lectures and in other recent work with which I am not acquainted.

5 For various statements of the principle or approximations to it, see Xenophanes A28; Parmenides B8, 9; Melissus B1–2; Leucippus A8, B2. See also Plato, *Phaedo* 98–9, 108E–109E; *Timaeus* 62E12ff.

6 There are doubts about the opposite dependency – doubts that one may suppose can only be cleared up by an elucidation of 'reason' diverging from, e.g., Leibniz's interpretation of what counts as sufficiency. A full treatment of all this would divorce teleological conceptions of sufficient reason (Socrates, Plato, Leibniz) from anti-teleological conceptions. For Heraclitus' anti-teleological stance see B52, B124 ('The fairest order in the world is a heap of random sweepings').

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Then, in the light of our findings under that head, we must revise and modify or develop our explanations. Which being done, we must go on, find more phenomena to explain, use these explananda to gain favour for more hypotheses, and then collect all our hypotheses together in order to test the new accumulated total commitment for consistency, plausibility etc . . .

No articulate statement of this method is to be found in Greek philosophy before Plato reaches for the Method of Dialectic in *Phaedo* and *Meno*, and tries in the *Republic* to marry it up with the idea of ultimate explanation in terms of the Good, which Leibniz inherited from him and brought into a quite special relation with Sufficient Reason. Nor is there any fully explicit statement of the Principle of Sufficient Reason before Parmenides. So sceptics will say that primitive natural philosophers such as the ones we are concerned with could not possibly have engaged in reasoning that wants so sophisticated a description. But to this I would reply first that Anaximander and Heraclitus and their successors were not primitive thinkers; and, second, that even if they were, we should still need to remember that very simple patterns of reasoning can satisfy very complicated theoretical descriptions. (Think even of the syllogism in Barbara.) The sophistication of the description we have to give in order to see the argument from the best explanation as a rational argument is no reason not to credit the Milesians (however methodologically unconscious they may have been) with the corresponding procedure – or with the conviction that is made for the method, that we live in a universe (as Edward Hussey puts it) of ‘order, lawlike regularity and intellectually satisfying construction’,⁷ susceptible of truly general, all-embracing explanatory hypotheses that stand in no need of qualification or adjustment *ad hoc*. (Cf. B4I etc., quoted in 1.1.)

1.3 From the nature of the hypothesis, the claim that Heraclitus and the Milesians have a common method can only be judged by the coherence and order that it will eventually discover to us if we see these men as building up their world-picture in response to the demands made upon them by the principle of Sufficient Reason and in the light of the precept always to argue back to the best explanation. In the interim, some more immediate conviction of

⁷ Edward Hussey, *The Presocratics* (London 1972), 17.

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Heraclitus' continuity with the Milesians may be created by reconsideration of the familiar text where it seems that Heraclitus makes allusion to Anaximander. This is the correction that Heraclitus seems to offer of Anaximander's doctrine of mutual reparation. Anaximander had said:

Whence things originate, thither according to necessity they must return and perish [that is, back into the same components]; for they must pay penalty and be judged for their injustice in accordance with the assessment of time (B1).

It would appear that Heraclitus found much to agree with in this opinion, offering an excellent gloss on Anaximander's most probable meaning:

Cold things grow warm, warm cools, moist grows parched, dry dampens (B126).

But there was a fault that Heraclitus found with Anaximander:

One must understand that war is universal, strife is justice, and that absolutely everything happens by strife and by necessity (B80);

and he denounced Homer (cf. Aristotle, *Eth. Eud.* 1235a26 [+ scholiast on *Iliad* XVIII 107] = A22) for saying 'Would that strife would perish from among gods and men', complaining that Homer did not see that he was praying for the destruction of the universe.

Now it is scarcely denied by anybody that B80 is a clear and (by Heraclitean standards) respectful allusion to Anaximander.⁸ What has been insufficiently remarked is that such a disagreement between the two of them only makes sense against some background of agreement. What was this background? Only one answer readily suggests itself. They agree in wanting to explain the maintenance of the world order. Evidently they also agree that the maintenance of the world order (or the maintenance, had we better say in Anaximander's case, of this particular whorl off the *Apeiron*?) must be managed from within a definite store of something or other. Unless this were agreed, why otherwise should there be any need for what Anaximander calls *requital for injustice* and what Heraclitus prefers to see as *mere exchange* – one thing's superseding another, as one piece replaces another on a

8 Cf. Vlastos, 'On Heraclitus', *American Journal of Philology*, 1955.

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square in the game of *peSSI*? (Cf. B52) If the two agree that this sort of process must be postulated, the disagreement between them relates only to the proper view to take of the justice or injustice of the process they otherwise agree about.

Here of course I am guessing – as I believe everyone interested in either Heraclitus or Anaximander ought to be obliged to guess. And obviously the guess must be pitted against any rival suggestion about what the background of agreement was. But this particular suggestion, together with the special idea that it imports of the autonomic steering or regulation of the world order, has the signal advantage of engaging well with information that we have from Aristotle about his predecessors. Aristotle says that one of their concerns was that coming to be and passing away should not give out.⁹ On my reading, Anaximander and Heraclitus will be prominent examples of philosophers with this preoccupation.

1.4 Such familiar reflections will lead into others. In Anaximander certain questions appear to have been left open about the origin and continuous renewal of the world as we know it. Presumably B1 was his most striking contribution to the problem. But Heraclitus himself *closed* these questions. Not only was this cosmos made neither of god nor of man, but always has been, is and always will be, an everlasting fire going out in measures and kindling in measures,¹⁰

the steering too (or the governance of the world as we know it) is said by Heraclitus to be from within, not, as it may have been for Anaximander, by the Boundless from without. (Cf. on Anaximander, Aristotle, *Physics* 203b7ff.) For whatever Heraclitus' thunderbolt is, whatever his Zeus may be, and whatever the relations may be between thunderbolt and Heraclitean fire (per-

9 Cf. *Ph.* 203b15–30, 208a8–9; *GC* 336a14–18; Burnet, *Early Greek Philosophy* (London 1908²), 60.

10 B30 (in part). Aristotle is thought to have been the first to assert that the *kosmos* was not created. But B30 suggests that he was anticipated in this not altogether satisfactory move by Heraclitus.

Aristotle asserts (*Cael.* 279b12) that all his predecessors believed that the *kosmos* had a beginning, though many denied (280a11) that matter had a beginning. To reconcile B30 with Aristotle it seems best to locate the difference Aristotle sees between himself and Heraclitus in the *periodicity* of things. Aristotle contemplates little or no variability from the kind of world order that is familiar to us, Heraclitus an orderly eternal periodicity. See 4.1, 4.2.

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haps these things can be debated), thunderbolt is or stands for something inside the world; and

Thunderbolt steers all things (B64).

But then, if the steering of the *kosmos* was from within and if the maintenance of its order and vital activity was a question that required an answer, the idea of autonomic regulation that appears in the Anaximander fragment was exactly the idea that Heraclitus needed. One can scarcely imagine a more natural continuity between the doctrines of two independent thinkers, where the second knows the work of the first and improves or simplifies or develops it.

2 *A hypothetical reconstruction of the scaffolding of Heraclitus' theory of flux*

2.1 I embark now on the hazardous and experimental work of the reconstruction of the philosophical motivation for Heraclitus' world view – a necessary task, but one that was speculative even in early antiquity. So far I have credited him with a Milesian method – the method of postulating whatever appears the best explanation of a phenomenon. I have quoted his conviction of the unity of things (which, as the reader will have guessed, I want to see as related to one consequence of that method). And I have implicated him in what I argue to have been a Milesian question about the maintenance of the world's motion, order and vital activity. To complete that stage of the reconstruction I have to ask what observations or phenomena can be expected to have given him the *question* of the constant renewal of the world and made it as pressing as the fragments cited in 1.4 above have suggested to me that it was. The most natural answer would appear to be:

- (a) the everyday observation of the conspicuous but not manifestly ubiquitous disintegration of terrestrial *order*, and the observation of the constant transmutation and decay of terrestrial *substances*;
- (b) the equally familiar observation of the habitual tendency of terrestrial *motions* to run down;
- (c) the observation of the continuation, in spite of all this, of the world that we know, replenished by creation, growth, and new motion. When one substance ceases to exist,

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another takes its place. When one motion is spent, others appear and inherit its impetus.

Observations (a) (b) (c) suffice to justify the postulation of a theory of reparation. But what else beside these things did Heraclitus observe and seek to explain and bring into harmony with them? He is credited with all sorts of hypotheses about sun, moon and stars as bowls of fire, and about the periodic and regular inclinations of these bowls. Such hypotheses, if Heraclitus really propounded them, were evidently designed to explain differences of night and day, or the warmth and coolness of the seasons. I am disposed to agree with the sceptical historian of science D. R. Dicks¹¹ that it is 'doubtful whether any of this [would-be astronomical detail] represents even approximately what Heraclitus thought'; but the detailed accuracy of the reports matter far less than a presumption which they help to sustain, that such celestial happenings were among the phenomena that Heraclitus treated as explananda. Dicks is surely right again when he declares, on the basis of fragments such as B94,

The sun will not transgress his due measure: otherwise the Erinyes, the ministers of justice, will find him out¹²

and B100

. . . the cycles the sun presides over, in order to determine and adjudicate the changes and seasons that produce everything,

that 'two things in particular struck [Heraclitus] when he contemplated [the cosmic] order, first the fact of its continuity, and second its periodicity'. But if this is what impresses about the heavens, then how is the apparent anomaly, diversity and small-scale disorder of terrestrial phenomena and the limited persistence of ordinary continuants to be subsumed under *one* order of nature with celestial imperishability, continuity and periodicity? Surely what underlies celestial stability must be some regular lawlike process or processes. Nothing less will suffice to explain celestial phenomena. But if so, then, despite appearances, regularity of process must underlie terrestrial phenomena too – unless we are to breach the *a priori* requirement of unity (see B4I etc. quoted in

11 D. R. Dicks, *Early Greek Astronomy to Aristotle* (London 1970).

12 Cf. B120, on which see Kahn, *Anaximander*, 197.

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1.1). In the name of unity, which is only another aspect of Sufficient Reason, the orderly process that is manifest in the heavens must be something that the natural philosopher can recklessly hypothesise to hold absolutely everywhere, and so upon earth – in spite of the apparent contrast between the perishability of terrestrial bodies and the apparent imperishability of heavenly ones. The conviction of unity ('one from all and all from one') forces us to see the terrestrial order as continuously renewed in spite of disintegration and change; and the celestial order as subject to continuous processes of change in spite of its regularity, periodicity and everlastingness. But if unseen elemental processes are uniformly regular and directed, then anomaly is an illusion that results from our imperfect understanding of their interaction, and, if all involve change, then permanence or apparent cessation of activity represents equilibrium (temporary equality, not armistice) between unseen forces that are opposing one another actively.

2.2 When he reaches this point Heraclitus has advanced well past the observational-cum-hypothetical stage of scientific theorising that I began by describing. He is offering redescription of phenomena themselves in terms more theory-contaminated than any that our senses could offer, and then reconceptualising the classes of terrestrial and celestial phenomena in defiance of observed differences.

The hidden joining/harmony is stronger than the visible one (B52).

One hypothesis leads to the necessity for another. Inasmuch as every one of the elemental processes hypothesised must, unless resisted by others, take over the whole world, the belief in the continuance of the world obliges him to believe in the irresolubility (by treaty, by exhaustion, or by any other means) of the struggle in which they are locked. Strife is ubiquitous and universal. But being the instrument of renewal and restitution, it is also just.

2.3 So much for a first attempt at reconstruction of how we may find it intelligible that Heraclitus makes perpetual process or change the model by which to redescribe everything. We have motivated the idea of a flux that is ubiquitous, incessant, excep-

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tionless and all-embracing, and in virtue of which not only all living things flow but absolutely all perceptible things – stones, rocks, even the sun (cf. B8) – flow (cf. Aristotle, *Metaphysics* 987a33, 1078b14, Melissus DK B8). And, seeing Heraclitus in this light, we find nothing to astonish us in Plato's report that:

Heraclitus said that everything is in a stage of change and nothing stays stable, and likening things to the flow of a river he says that you could not step twice into the same river (*Cratylus* 402A)¹³

or in Aristotle's testimony:

And some say that all existing things without exception are in constant movement, but this escapes our perception. Supporters of this theory do not state clearly what kind of motion they mean or whether they mean all kinds (*Physics* 253b9–12).

It is plain that those physicists who assert that all sensible things are always in motion are wrong . . . They mostly conceive this as alteration (things are always in flux and decay, they say), and they go so far as to speak even of becoming and perishing as a process of alteration (ibid. 265a2–7).

It is true that someone may still ask why we should believe that everything in heaven and earth is in flux and participates in a hidden harmony of opposites. But the ready answer to that question is that Heraclitus' argument or doctrine is simply a bold generalisation from certain special cases or phenomena. It was the height of madness to extend his theory from these phenomena to absolutely everything. But before one derides the theory for that reason one should ask how else Sufficient Reason is to be reconciled with the convictions that our senses make it nearly impossible for us to abandon, about earth and sky and the seemingly continuous motion and renewal of the *kosmos*. (And how else, we can then reflect, is the ordinary behaviour of colliding bodies to be explained, unless *all* bodies contain opposing processes?)

13 In 'Natural Change in Heraclitus', *Mind*, 60 (1951), 38–42, G. S. Kirk has sought to cast doubt on Plato's testimony here. He has done this in the name of doctrines of measure and reciprocity between opposites whose attribution to Heraclitus he has made very persuasive. My exposition of these doctrines is indebted both to this article and to Kirk's *Heraclitus: The Cosmic Fragments* (Cambridge 1954). I also believe Kirk reconstructs the river fragment correctly. (Cf. 2.5 below: if Heraclitus also said that you could not step into the same river twice, that is a hyperbolic restatement of what is said soberly and correctly in B12.) But against Kirk, I should claim that, on a more correct understanding of change than Plato achieved when he departed from the everyday conception to which Heraclitus was party, there is no conflict of any sort between the measure doctrine and the doctrine of universal flux.