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III.—NATURAL CHANGE IN HERACLITUS

BY G. S. KIRK

THE thought of Heraclitus of Ephesus is still often summarized as "All things are flowing", πάντα ῥεῖ; by which it is inferred that everything is in *constant* change. This summary goes back ultimately to Plato, who at *Cratylus*, 402a, wrote as follows: "Heraclitus says somewhere that everything is moving and nothing stays still, and likening things to the flow of a river he says that you could not step twice into the same river". Plato's interpretation was adopted by Aristotle, and through him by Theophrastus, whose "Opinions of the Physicists" became the basis of all later ancient accounts. Recently, however, some scholars have become sceptical about the accuracy of the Platonic-Aristotelian interpretation of Heraclitus' views on change; and with good cause, for the fact is that there is nothing in the extant fragments about the constant flux of all things, even though one would have expected the survival of some original support for a view so widely popularized in the fourth century. The assumption from this is that the constancy of change is not an idea which Heraclitus particularly stressed. What he undoubtedly did stress above all else was his discovery of the unity that subsists in apparent opposites: it is with failure to apprehend this unity that he so bitterly reproaches his fellow men. Plato bears witness to this theory as well as to the theory of change, and Aristotle mentions it repeatedly because he thought that Heraclitus was thereby denying the law of contradiction—which shows how little Aristotle appreciated the real application of Heraclitus' *grande idée*. Later, Philo asserted categorically that Heraclitus' vaunted discovery was simply that if a unity is split opposites are revealed, and that opposites are really one; a discovery, Philo typically adds, which should really be credited to Moses.

How is it then, we may pertinently ask, that Plato gave such prominence to the idea of constant and universal change in Heraclitus? Fortunately we possess a pair of certainly genuine fragments which are in themselves capable of having misled Plato, who, it should be remembered, did not set out to be a historian of philosophy, and who never took Heraclitus quite

seriously in the dialogues. The more important of these fragments, 12 in Diels' order, says: "Upon those who step into the same rivers, different and different waters flow" (*ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμβαίνουσιν ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ*). The following sentence, "and souls too are exhaled from moisture", must be counted an irrelevant addition by the Stoic Cleanthes, to whom ultimately the preservation of the fragment is due. The second fragment, 91, consists simply of three pairs of verbs describing water in a river: "Scatters-gathers: concentrates-disperses; approaches-departs" (*σκήδνησι καὶ . . . συνάγει . . . συνίσταται καὶ ἀπολείπει καὶ πρόσεισι καὶ ἀπεισι*)—the rest being merely interpretation on Platonic lines by Plutarch.¹

Now Karl Reinhardt has shown² that Heraclitus says nothing here about *things being like* a river, but merely points to a certain aspect of the behaviour of rivers in general. Some think that fr. 12 is no more than another example, purely formal in type, of the coincidence of opposites—in this case of "same" and "different": upon those who step into the *same* rivers *different* waters flow. But this is to reduce its emphasis too much, and there are serious objections against this interpretation: first, the other Heraclitean examples of the coincidence of opposites are far more concrete, less purely logical, than "same-other"; witness "summer-winter", "war-peace", "the young-the old", "the straight-the crooked", "the way up-the way down"—for Heraclitus, these were not abstractions as they are for us. Secondly, such examples in other fragments are unmistakably framed as such: "the way up and the way down is one and the same", and so on. Thirdly, the identification of "same" and "other" would destroy all differentiation, while Heraclitus was content that his unity should be an underlying one, an *ἀφανῆς ἄρμονία*: he was not Parmenides. What these river-fragments *are* intended to show, I believe, is the regularity, the order, the *μέτρον* or measure, which Heraclitus believed to underly and to control natural change in all its forms. The example of the river is intended to illustrate this *μέτρον*. The repetition of the word "different", *ἕτερα καὶ ἕτερα*, well suggests the regularity of the onrush of waters, although it is no

¹ The other commonly-accepted river-fragment, 49a, consists of a later paraphrase of fr. 12 to which the un-Heraclitean deduction "we are and are not" has been added. It has no value as evidence for Heraclitus.

² Most clearly in *Hermes*, 77 (1942), 18 f.; see also his *Parmenides und die Geschichte der griechischen Philosophie*, 177, where he touches briefly on the implications of the river-image which are stressed below. He does not, however, face the difficulty caused by his supposition that fr. 12 comes from a psychological context.

more than a suggestion ; and the oppositions of fr. 91, which in its original setting may have followed directly upon fr. 12, express the reciprocity and quantitative balance much more unmissably : “ it scatters and gathers, concentrates and disperses, approaches and departs ”. The continued existence of the river as a whole, of the “ same ” river in Heraclitus’ terms, depends upon the maintenance of this regularity in the movement of the waters past a fixed point, the *ἐμβαίνοντες*. Of course the idea of the preservation of a kind of stability in change is there too, but it is subordinated to and dependent on the idea of *μέτρον*. The river-fragments, then, seem to exemplify not the constancy of change—for there is no hint that all things resemble rivers—but the regularity of natural change in one particular manifestation.

Before this interpretation can be accepted (and it is pitted against that of Plato himself, a powerful authority, though I suspect that he may not have known as many of the actual sayings of Heraclitus as even we do) it must be compared with the evidence of the other extant fragments. Does the idea of measure in change appear prominently there ? Indeed it does : in fact once the idea of *μέτρον* is isolated it can be seen springing up everywhere. This of course is the trouble with Heraclitus ; any idea which arouses the student’s enthusiasm can do the same—that is why we have Heraclitus the Hegelian and Heraclitus the Existentialist. However, consider the evidence. In fr. 30 the cosmos is an everliving fire, kindling *in measures* and going out in measures (*ἀπτόμενον μέτρα καὶ ἀποσβεννύμενον μέτρα*). In fr. 31 the sea is measured (*μετρέεται*) into the same proportion as applied to it before it became earth. In fr. 90 fire is an exchange for all things and all things for fire as goods for gold and gold for goods. In fr. 88 (of a group of opposites like summer-winter) “ these things change places and are those, and those change places again and are these ”, where *μεταπεσόντα* implies a regular exchange. In fr. 94 “ the sun will not overstep his measures (*μέτρα*) ; if he does, the Erinyes, agents of Dike, will find him out ”. In fr. 51 that which tends apart also coincides : it is a *παλίντονος ἄρμονίη*, a join which works in both directions like the string of a bow or a lyre ; note that here too the tension must operate equally in each direction—the inward pull of the string must equal the outward pull of the arms of the instrument, otherwise the string is too loose or the whole instrument breaks. Akin to the idea of measure is that of plan and direction in the world, as in fr. 41 : wisdom is to know how all things are guided ; and in fr. 80 : all things happen by strife and *necessity*. The

concept of Logos supplements this whole picture ; Logos for Heraclitus is the single formula or plan according to which all things happen (fr. 1, . . . *γνωμένων πάντων κατὰ τὸν λόγον τόνδε*) ; so also the use of *κόσμος* in fr. 30 : “ This *κόσμον* no man or god made ; it was, is, and shall be ”. Now *κόσμος* for Heraclitus, in the early fifth century, must still have retained much of its basic meaning of “ order ”, “ regularity ” ; it cannot just mean “ world ” in our practical sense, and is perhaps best translated as “ organism ”.

Two related questions may now be asked. First, if the river-fragments do not contain the idea of universal and constant change, how far was this idea held by Heraclitus ? And secondly, why such insistence on *μέτρον* ? The answer to the first question is that the universality of change, though not its absolute constancy, was a commonplace of early Greek thought which Heraclitus cannot have avoided : change is going on everywhere, you only have to use your eyes. The Milesians did not think it necessary to give a formal explanation ; probably they regarded all things as alive, and change is a property of life. Heraclitus had to be a little more explicit, because the unity which for him connected all natural existents depended on the inevitability of change, sooner or later, in every division of nature ; while the somewhat different unity of the Milesians and their mythological forerunners depended upon a world-forming process out of a single source, a process which gradually slows down and in the final stages of which change is no longer indispensable to unity, but is taken for granted. Heraclitus' unification of apparent opposites depended in its clearest form upon an unailing reciprocal movement between extremes : night succeeds day and day night, therefore night-day is a single continuum ; so too with the other pairs of opposites ; therefore, he concluded by an intolerable leap of the imagination, all things are one. If the succession fails the unity is destroyed, and with it the Logos which relates man to his surroundings and is therefore so important to understand. The reciprocity *must* continue, and it does so, says Heraclitus in metaphorical terms which are logically no advance on the reproductive imagery or the automatic assumption of his predecessors, because “ war is common and strife is justice ”, because “ war is the father and king of all ”, because “ it rests by changing ”. It continues because things are an everliving fire and fire is creative, as in animal reproduction, and self-moving. But this is not to say, as will be seen later, that everything is flowing in the sense that it is changing at every instant. The answer to the second question, why there is such emphasis on

μέτρον, is not dissimilar : the unity which subsists in opposites depends not only on their alteration one into the other, but also on the quantitative regularity of this alteration. If the total amount of old age in the world begins greatly to exceed the total amount of youth, then the succession will eventually fail. If the total amount of heat and dryness in summer begins to outweigh the total amount of cold and wetness in winter, or vice versa, first the crops will fail and eventually the earth will be overcome by one of those catastrophes of fire or flood which are so often hinted at in Greek literature, and which belong perhaps to one of the earliest stages of primitive mythology, but which for Heraclitus at any rate were not more than theoretical contingencies. If the balance of processes is destroyed then the underlying unity of the cosmos fails, and this, for Heraclitus, was unthinkable. And this balance depends on *μέτρον*.

This idea of *μέτρον* was taken by Heraclitus primarily from the sphere of ethics and applied by him to the workings of nature in general, but most clearly to natural changes on the large scale ; though we have seen that it underlies reciprocal change on any scale. For although Heraclitus had broken away from the old cosmogonical tradition, and although judging from the complaints of Theophrastus he did not devote much time to specific natural questions like What is a rainbow or What causes the flooding of the Nile, yet he could not and did not neglect to give some explanation of cosmology, the working of the world which men see around them. Indeed, if as he maintained there is a single Logos or formula of things, this Logos must explain meteorological and cosmological changes as well as the reciprocity between opposites in categories such as life-death and war-peace. Strangely enough, however, we do not find that Heraclitus used his discovery of the unity of opposites, in any obvious way at any rate, to explain cosmological phenomena. The cosmos (in the sense of an ordered whole) is a fire which turns into sea and into earth and then back again. This is a reciprocal and not a cyclical movement, but it is a reciprocal movement between three and not two members—that is, not between opposites—so that the simple logical unity that connects for example night and day does not apply here. Formally the only common factor between Heraclitus' account of meteorological-cosmological change and his account of change between opposites, which is implied to be the type into which all other kinds of change can be analysed, is the idea of *μέτρον*. In fr. 31 we learn that the turnings of fire (*πυρός τροπαί*) are as follows : first into sea, and half sea is turning to earth, half of it being replenished from fire ; the portion that became

earth eventually dissolves again and is measured into the same amount of sea as existed before it became earth. What is described here in these complicated and schematic terms is not, as Theophrastus thought, a world-forming or cosmogonical process ; it is the constant weather-process by which the sun feeds on water evaporated from the sea, and precipitates it again as rain ; part of the sea is drying up (for example Heraclitus' own Cayster river, which was silting badly ; the fossils in Sicily, Paros, Malta, cited by Xenophanes ; the legendary emergence from the sea of Rhodes and Delos), while an equal part of it is expanding (for example the submergence of the Strait of Messina, and the rise of new springs and rivers). As long as these large-scale natural processes remain in balance the unity of the cosmos is preserved, and the total amount of fire in all its forms remains the same. When he tried to explain how or why the *μέτρα* were preserved Heraclitus resorted to metaphor, as he did in the case of the source and motive of change. If the sun oversteps his measures¹ the Erinyes, traditional guardians of natural laws, will find him out. This resort to mythology and metaphor occurs at a certain point in all the Presocratic accounts (and indeed in all philosophies) and is exemplified by the "penalty and retribution" of Anaximander and the "strong Necessity" with her fetters of Parmenides. It occurs as an attempt to *motivate* the structure or *μέτρον* which has been observed in or deduced from phenomena.

In this large-scale sphere of meteorological-cosmological change the process is clearly spasmodic ; thus all sea is not always being evaporated, and parts of the earth may remain static for a time. If we look lower in the scale we see that there too, in Heraclitus' formulation, no necessity exists for a *constant* change in everything. Man, it is true, is in unceasing change : he is constantly growing older and as he does so the structure of his body alters. Thus a fragment which is ascribed to Epicharmus describes how a debtor excuses himself by saying that he is not the same man as he who incurred the debt, his *Logos* has changed.² But when one descends still lower in the scale, to less animate objects like rocks and tables, it becomes exceedingly doubtful

¹ This probably means—for *ὑπερβήσεται* should be taken literally at this stage of the language—if he trespasses too far north or south on the path of the ecliptic, and so upsets the seasons : *μέτρα* is still quantitative as always in Heraclitus, though in this case it would have the sense of "boundaries". It may just mean quantitative measures of fire, *i.e.* the sun must not become too large and hot.

² The same idea, applied again to the human body, recurs in Plato ; it is not, I suspect, a specifically Heraclitean invention, but a popular and traditional witticism or figure of speech.

once more whether Heraclitus believed in *constant* change for everything. This would be hardly worth stressing were it not that one school of thought, of which Heidegger in his article "Qualitative Change in Pre-Socratic Philosophy" (*Archiv. f. Gesch. der Philosophie*, 19 (1905-06), 350 ff.) was representative, actually proposed a kind of molecular theory according to which this table, for example, is constantly changing by the *invisible* addition and subtraction of portions of fire, water, or earth, on a par somehow with the cosmological process. This unwarranted interpretation seems to stem from Aristotle, who in one passage (*Physics* Θ . 3. 253b9) says, clearly of Heraclitus and his supporters: "And some say that all existing things without exception are in constant movement, but that *this escapes our perception*". It is most unlikely that Heraclitus ever held such a view. Contrary to what is often written of him, he believed strongly in the value of sense-perception providing that it is interpreted intelligently, with *φρόνησις*, by souls which understand its language.¹ His criticism of men is based on the fact that the truth is there to be observed, it is common to all, but they cannot see it: apprehension of the Logos is no mystical process but the result of using eyes, ears, and common sense. Our observation tells us that this table is *not* changing at every instant, even if our experience concedes that it will eventually change. This eventuality is all that is necessary: just as the movement between war and peace, for example, was inevitable but nevertheless, in Heraclitus' day, spasmodic and not continuous, so objects may be held temporarily in stability by virtue of a *παλάττονος ἀρμονίη*; the tendencies to turn into earth or fire may be equally balanced. Provided the total *μέτρα* in the world are preserved a large number of things may and do exist for a time without changing; but eventually the tension in one direction or the other will dominate and the material composing this table will return, perhaps deviously, to the fire from which it was originally extinguished.

The theory that all things are *constantly* changing was perhaps first explicitly formulated not by Heraclitus but as a manifest absurdity by the Eleatic Melissus.² He was trying to defend the paradoxical Eleatic idea of reality by attacking the validity of the senses, and wrote as follows: (fr. 8): ". . . But to us the hot seems to become cold and the cold hot, and the hard soft and the soft hard . . . iron in spite of its hardness seems to be

¹ Cf. fr. 55, 107, 101a; 17, 72.

² This was suggested by E. Weerts, "Plato und der Heraklitismus", *Philologus*, Suppl. 23, 1 (1931).

rubbed down by the finger through contact, and so also gold and stone and whatever else seems to be hard and fast ; and earth and stone seem to come to be out of water ; so the consequence is that we neither actually *see*, nor recognise things which *are*". Some of the oppositions here may be taken from Heraclitus, but I believe that the examples of iron, stone, and gold, are an extension by Melissus himself, who had far more motive (though in a negative direction) for emphasising the constancy and universality of natural change than Heraclitus ever had.

For Heraclitus then what we see in individual things is either the prospect or the actuality of quantitatively regulated change. What we see in the sum of things, changing and temporarily stable, is the single Logos which is a broader aspect of the μέτρον which regulates all change. The concept of measure equals in importance, and surpasses in the consistency of its application, that other basic concept of War and Strife, of inevitable alteration. Both concepts are needed to make plausible the kind of unity which Heraclitus saw in opposites ; both are needed to mediate between this unity and the other unity of Fire. In the river-fragments the concept of μέτρον in change is the one which is stressed : to ignore this concept and build upon these fragments an anachronistic elaboration of the War-Strife concept, like the Platonic πάντα ῥεῖ interpretation, is to destroy that unified picture of the outside world which Heraclitus tried to present to obtuse mankind.

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