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GUTHRIE, W. K. C.

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The Greek Philosophers

from Thales to Aristotle

W. K. C. GUTHRIE

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(Ionians and Pythagoreans)
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CHAPTER II

MATTER AND FORM

(Ionians and Pythagoreans)

WE saw in the last chapter that philosophy as we shall be concerned with it has two main sides, dealing on the one hand with the nature and origins of the Universe at large and on the other with human life and conduct; and I warned any who might be primarily interested in ethical and political thought that when we go back to the beginnings of European philosophy in Greece it is speculation about the Universe that we shall encounter first. The whole period which we shall have under review is usually divided into two by the name of Socrates—with what justification we shall see as we proceed—and the characteristic mark of pre-Socratic thought is a consuming curiosity about the cosmos. The lifetime of Socrates saw a reaction against physical speculation and a shifting of philosophical interest to human affairs. Like all large generalizations, this is only approximately true. While in the Eastern part of the Greek world the Ionians were absorbed in the first attempts at a scientific explanation of the Universe, in the West the Pythagoreans were setting up the ideal of philosophy as a way of life, and the philosophic brotherhood as a kind of religious order; and the great successors of Socrates, Plato and Aristotle, while not neglecting the problems of human life, were both interested also in speculation about the world in which we live. For Plato indeed the human soul was at the centre; but in Aristotle

the taste for the disinterested investigation of nature for its own sake reached its height. More than any other Greek did he possess the scientific temperament. Moreover the interest of the Pythagoreans in the human soul was rather religious and mystical than philosophical. We may say, however, that such an *exclusive* devotion to external nature as was exhibited by the Ionians became for ever impossible after the apparent breakdown of natural philosophy in the fifth century, and the importunate questionings of Socrates which brought human life into the very centre of the picture. How all this happened we shall now proceed to inquire.

European philosophy, in the sense of an attempt to solve the problems of the Universe by reason only, as opposed to the acceptance of purely magical or theological explanations, began in the prosperous commercial cities of Ionia, on the coast of Asia Minor, in the early sixth century B.C. It was, as Aristotle said, the product of an age already provided with the necessities for physical well-being and leisure, and its motive was simple curiosity. The Ionian or Milesian School is represented by the names of Thales, Anaximander and Anaximenes, and there is this much justification for calling it a school, that all three were natives of the same prosperous Ionian city of Miletus, their lifetimes overlapped, and tradition at least described their relations as those of master and pupil.

The object of their search may be described in two ways. They looked for something permanent, persisting through the chaos of apparent change; and they thought that they would find it by asking the question: 'What is the world made of?' The world

as our senses perceive it seems restless and unstable. It exhibits continual and apparently haphazard change. Natural growth may proceed or may be thwarted by blind external forces. In any case it is followed by decay and nothing lasts for ever. Moreover we observe an apparently infinite plurality of unrelated objects. Philosophy started in the faith that beneath this apparent chaos there exists a hidden permanence and unity, discernible, if not by sense, then by the mind. This statement applies of course to all philosophy. As a modern writer on philosophical method has put it:

'There seems to be a deep-rooted tendency in the human mind to seek . . . something that persists through change. Consequently the desire for explanation seems to be satisfied only by the discovery that what appears to be new and different was there all the time. Hence the search for an *underlying* identity, a persistent stuff, a substance that is conserved in spite of qualitative changes and in terms of which these changes can be explained.'¹

That description of the philosophic mind might have been written specially for the Milesians. They were already philosophers, and the basic problems of philosophy change little through the ages. Central is the faith that beneath the apparent multiplicity and confusion of the universe around us there exists a fundamental simplicity and stability which reason may discover.

Secondly, it seemed to the earliest speculators that this stability must be sought in the substance of which the world was made. 'This is not the only

¹ L. S. Stebbing, *A Modern Introduction to Logic*, (Methuen, 2nd ed. 1938), p. 404.

possible answer. It may equally be supposed that the material components of the world *are* in a constant flux of decay and renewal, *are* manifold and incomprehensible, but that the permanent and comprehensible element lies in its structure or form. If new matter as it comes along fits itself always to the same structure, it is the structure that we must try to understand. In Greece itself the champions of form against matter were to have their turn. At the beginning, however, the question asked was, in its simplest terms: 'What is the world made of?' Thales of Miletus said that it was water, or moisture, an answer which might open up all sorts of interesting possibilities, were it not that we know scarcely anything more about his views and can only conjecture what was the train of thought which led him to his conclusion. The most obvious explanation seems to be that water exhibits itself naturally to the senses, without any apparatus of scientific experiment such as was not then available, in the three forms solid, liquid and gaseous, as ice, water and steam. This is accordingly the explanation which occurs most readily to modern scholars, but it is interesting that Aristotle has a quite different suggestion. He, too, was guessing—whatever Thales may have written was already lost in his day—but he was at least a Greek and nearer to Thales than ourselves. I want to suggest some reasons why he may have been right, but this is a topic to which we had better return when we have looked at the views of the other two Milesians.

Beyond his statement that the underlying substance of the Universe is water, we know little of Thales's philosophical views. There are one or two

aphorisms, difficult to interpret without a context, and several anecdotes. The story in Herodotus that he predicted a solar eclipse, which can be dated to the year 585 B.C., may be taken to be sufficiently *bien trouvé* to give us his approximate date. The prediction is by no means impossible with the aid of the Babylonian records of which he is said to have been a student. We know more of his younger fellow-citizen Anaximander, who left writings which were certainly available to Aristotle and Theophrastus, and the work of Theophrastus on the *Opinions of the Natural Philosophers* was the basis of the Graeco-Roman compilations which have come down to us.

The thought of Anaximander was already of some subtlety. He saw this present world as a warring concourse of opposite qualities, of which four were primary—hot and cold, wet and dry. The world-process is a cyclic one. The sun's heat dries up water, water puts out fire. On a world-scale it is observable in the cycle of the seasons, and though one or other of the opposites may prevail for a time, the balance is constantly being restored. Now since the essential thing about these qualities is their mutual opposition, it follows that the primary substance of the Universe cannot be characterized by any one of them—cannot, Anaximander would have said, *be* any one of them, for it is most unlikely that at this early stage of thought quality and substance were differentiated. Had Anaximander been asked whether, when he spoke as he did of 'the hot' or 'the cold', he meant a substance or a quality, he would probably not have understood the question. If then, as Thales had supposed, all were originally water, or 'the moist', there could never be heat or fire, since

water does not generate fire, but destroys it. Hence he imagined the first state of matter to be an undifferentiated mass of enormous extent, in which the antagonistic elements or their properties were not yet distinct, though it contained them as it were in a latent or potential form, a complete fusion. He called it the *apeiron*, a word which means 'without boundaries', and in later Greek was used in two main senses: (a) not bounded externally, i.e. spatially infinite, and (b) without internal boundaries, i.e. in which no distinctions of separate component parts, or elements, could be observed. It is unlikely that Anaximander had arrived at the notion of strict spatial infinity, and although he certainly conceived his matrix to be of vast and indeterminate extent, the thought uppermost in his mind was probably the lack of internal distinctions, since this is the concept which would solve the problem that was obviously on his mind, that of the original condition of the opposites.

This primal mass was pictured by Anaximander as being in everlasting motion, as a result of which it happened, at some time in some part of it, that the opposite qualities, or substances containing them, began to separate themselves out. Hence arose what Anaximander called a seed or germ of a world, a fertile nucleus—for he borrowed that term from the realm of organic nature. At first it must have been something like the whirling nebulae known to modern astronomy. Gradually the cold and wet element condensed into a wet mass of earth at the centre, wrapped round in cloud or mist. The hot and dry showed itself as a sphere of flame enclosing the whole, which as it revolved burst apart into rings or wheels of fire around which surged the dark mist

from within the sphere. This is his explanation of sun, moon, and stars, each of which is really a ring of fire right round the earth, though only visible to us at one point where there is a hole in the encircling vapours through which the fire streams like air through a puncture in a bicycle tyre. Under the influence of the fire at the circumference, parts of the earth were dried out and separated from the water that surrounded them. Life first arose during this process in the warm mud or slime, for the origin of life was in moisture acted upon by warmth. The first animals were therefore fishlike, and enclosed in prickly or scaly coverings. From these developed all land-animals, including man, who has evolved ultimately from a sort of fish.

The earth in this account is cylindrical like a drum, and rests unsupported at the centre of a spherical universe. Here Anaximander gave, to a question which had long puzzled the Greeks, an answer which for subtlety of thought was ahead of many of his successors. What did the earth rest on? If on water, as Thales had said, then what did the water rest on, and so forth? It rests on nothing, said Anaximander, and the reason it does not fall is simply that, being at the centre of a spherical universe, and hence equidistant from all its points, it could have no reason for falling in one direction rather than in another. It is in the position of the donkey placed exactly half-way between two bundles of hay, which dies of starvation because it cannot decide which way to turn.

This cosmogony of Anaximander's, in spite of certain fantastic elements, was a remarkable achievement for the dawn of rational thought. He made

some use of observation, supporting his notion of the drying-out of the earth by the presence of fossilized shells in inland districts, and his argument that man had evolved from a lower form of life by the observation that, in his present state, man is helpless and dependent for a considerable time after birth. There must have been a time when the young were carried about for protection by the parent, and this, he observes, is done by certain species of large fish. To assess his quality, we must not only look back on him from our own time, but see him in relation to previous and contemporary Greece. His was an age when the supernatural was still taken for granted, when the forces of nature were attributed to the actions of anthropomorphic gods, a Zeus or a Poseidon, and the origin of the Universe had hitherto been sought in grotesque stories about a sexual union of heaven and earth, conceived as vast primeval deities, and their forcing-apart by another gigantic spirit. With Anaximander human reason asserted itself and produced what, right or wrong, was for the most part an account in purely natural terms of the origin of the world and life.

From Anaximenes, the remaining member of the Milesian School, we have no connected account of cosmogony, but a new claimant for the title of primary substance. This is air (Greek *aer*, which in ordinary speech—and there is no question at this stage of a technical scientific terminology—meant both air and mist or fog). In its natural, or what Anaximenes called its most evenly distributed state, it is the invisible atmosphere, but it is capable of being condensed into mist and water, and so, he claimed, still further into solid substances like earth

and stones. When it becomes still rarer, it also becomes hotter and turns into fire. His chief interest seems to have lain in discovering a natural process by which it might be supposed that the changes in the primary substance take place, whereby our manifold world comes into being. Anaximander's word for the process which gave rise to our world had been 'separating-out', but it could fairly be said that this was no more than a brilliant conjecture which could not be verified in any known process of nature. For it Anaximenes substituted the observed fact of condensation and rarefaction, whereby we see air reduced to moisture and vice versa. To illustrate the connexion of rarefaction with heat and condensation with cold he pointed out that if we breathe with our lips nearly closed the breath emerges cold, whereas if we open our mouths to give it more room it is warmer.

One particular tenet of Anaximenes throws light on the outlook of the whole school. He said that in its purest and rarest form of all, the air which is the ultimate world-substance is also the stuff of life. A small portion of this soul-stuff, which properly belongs by its nature to the outermost reaches of the Universe beyond the adulterated atmosphere which we breathe, is imprisoned in the body of each animal or human being, and forms its soul. 'Our soul', said one of his followers, 'is air, hotter than the air outside us, though much colder than the air at the sun.' This man also expressed the same thing by saying that man's soul is 'a small part of the god', the god being the Universe, which we thus learn is still thought of by these men as being alive. For all their astonishing freedom from theological preconceptions,

this one idea remained. It was indeed a legacy from pre-rational thought, for this material conception of the soul as air or breath is of course a primitive one to which anthropologists have found parallels among savage peoples all over the world, and it was certainly coupled among the earlier Greeks with the idea that the world as a whole was a living creature.

Nevertheless for these early scientists there was a special reason why it should still have seemed necessary. Besides the one question that they asked—What is the world made of?—there seems to us to be another which needs answering as well, namely: if the world is at bottom, and was originally, one substance, why did it not remain so, a dead, static mass of water or whatever it was? What was the motive cause which first started it changing? This question occurs to us because from recent science we have inherited the notion of matter as in itself something dead or inert, which needs to be called into motion by an outside force. Perhaps the distinction between matter and force is not so obvious in this century as it was in the last, nor does the natural scientist nowadays regard it as within his province to deal with the problem of a first cause. But philosophy cannot ignore it, and we are speaking of men to whom science and philosophy were one indivisible field of knowledge. How did they deal with this question of the cause of motion?

As Cornford put it, 'If we would understand the sixth-century philosophers, we must disabuse our minds of the atomistic conception of dead matter in mechanical motion and of the . . . dualism of matter and mind.' Aristotle, who was already criticizing

the Ionians for (as it appeared to him) 'lazily shelving' the question of the motive cause, remarks in one place, without comment, that none of them made earth the primary substance. There was surely a good reason for this. They wanted a substance which would *explain its own movement*, as in those early days it was still possible to imagine it doing. One thought of the ceaseless tossing of the sea, another of the rushing of the wind, and on the threshold of rational thought the natural explanation of their apparently self-caused movement was that they were eternally alive. Thus we find that all of them, while in other respects avoiding the language of religion and completely discarding the anthropomorphism of their time, yet applied the name God or 'the divine' to their primary substance. So Anaximander called his *apeiron* and Anaximenes the air. Thales is credited with the dictum: 'Everything is full of gods', which Aristotle interpreted as meaning that 'soul is mingled in the whole'. The stuff of the world must be the stuff of life, and that is why I think there is more to be said for Aristotle's conjectures about the reason for Thales's choice of water than modern commentators are inclined to allow. His words are: 'He got the notion probably from seeing that the nutriment of all things is moist, and that heat itself is generated by the moist and kept alive by it . . . and that the semen of all creatures has a moist nature, and water is the origin of the nature of moist things.'

The lines of thought suggested by Aristotle are those which link up water with the idea of life: the moisture which is a necessary part of food and semen, and the fact that vital heat, the warmth of a

living body, is always a damp warmth. (The connexion between heat and life, an obvious fact of experience, was insisted on by the Greeks as essential and causative more than it is to-day.) If that was Thales's idea, we find it explicitly paralleled by Anaximander who accounts for the origin of life by the action of heat on watery or slimy matter.

Seeing that these thinkers only asked their single question: 'What is the world made of?' it is tempting to label them materialists. This, however, would be misleading, since that term in ordinary modern speech stands for one who has made a choice between the known alternatives of matter and spirit as the ultimate causes of things, and consciously denies any originating power to the spiritual. What we must try to understand is a state of mind before matter and spirit had been distinguished, so that the matter which was the sole and unique fount of all existence was itself regarded as endowed with spirit or life. As philosophy progresses, it finds it more and more difficult to maintain this two-in-one conception, and not the least interesting aspect of the development of Greek thought is that which shows matter and spirit straining increasingly at the bonds which unite them. Matter has to be credited with more and more of the attributes of spirit, including mind, until the question comes to a head and a break is inevitable.

For the rest of this chapter let us turn to the Pythagoreans. The two main streams of tradition in early Greek thought were spoken of in later antiquity as the Ionian and the Italian. The latter begins with Pythagoras, who although an Eastern Greek by birth left his native island of Samos early in life and migrated to South Italy round about 580 B.C., where

he settled and founded his brotherhood in the town of Croton. For political reasons they were persecuted and dispersed, and by the fifth century scattered Pythagorean communities were to be found in various parts of Greece. To say nothing about the Pythagorean tradition would be to give a very one-sided view of Greek philosophy and to omit something that was a potent influence on the mind of Plato. Yet it would perhaps defeat our present purpose to devote much space to them here, owing to the obscurity which envelops much of their doctrine and their history.

For this obscurity there are good reasons. Among the Pythagoreans, the motive for philosophy was not what it had been for the Ionians, simple scientific curiosity. They were a religious brotherhood, and this had certain consequences. Some at least of their doctrines were held to be secret, and not to be divulged to the profane. The founder himself was canonized, or regarded as semi-divine. This meant in the first place that a haze of miraculous legend gathered about him, from which it is difficult to disentangle the life and teaching of the historical Pythagoras. In the second place it was considered a pious duty to ascribe any new doctrine to the founder himself, and considering that the school had a long history, including a particularly flourishing revival among the Romans in the time of Cicero, it is obviously difficult to find out just what were Pythagoras's own beliefs or those of the school in its early days.

On its religious side, the core of Pythagoreanism was a belief in the immortality of the human soul, and its progress through a series of incarnations not

only as man but also in the bodies of other creatures. With this is connected the most important of Pythagorean taboos, their abstention from animal flesh. For the beast or bird which you eat may haply be inhabited by the soul of your grandmother.

If that is so, if the transmigration of souls is possible and usual, then all life is akin, and the kinship of nature is another Pythagorean tenet. It went further than we might think, for the animate world extended further for them than it does for us. They believed indeed that the Universe as a whole was a living creature. In this they agreed with the Ionians, but they saw implications in it which were foreign to Anaximander or Anaximenes and came rather from mystical religious than from rational sources. The cosmos, they held, is surrounded with a boundless quantity of air or breath, which permeates and gives life to the whole. It is the same thing which gives life to individual living creatures. From this relic of popular belief, rationalized as we saw by Anaximenes, a religious lesson was now drawn. The breath or life of man and the breath or life of the infinite and divine Universe were essentially the same. The Universe was one, eternal and divine. Men were many and divided, and were mortal. But the essential part of man, his soul, was not mortal, and owed its immortality to this fact, that it was a fragment or spark of the divine soul, cut off and imprisoned in a mortal body.

Man had thus an aim in life, to shake off the taint of the body and, becoming pure spirit, rejoin the universal spirit to which he essentially belonged. Until the soul could purify itself completely, it must continue to undergo a series of transmigrations,

exchanging one body for another. This meant the retention of individuality so long as the allotted cycle of births was incomplete, but there can be little doubt that the ultimate aim was the annihilation of self in reunion with the divine.

These beliefs the Pythagoreans shared with other mystical sects, notably with those who taught in the name of the mythical Orpheus. But the originality of Pythagoras is seen when we ask what are the means whereby the aim of purification and union with the divine may be attained. Hitherto purity had been sought by ritual, and the observance of mechanical taboos such as the avoidance of corpses. Pythagoras retained much of this, but added a way of his own, the way of the philosopher.

The doctrine of the kinship of nature, which may be said to be the first principle of Pythagoreanism, is a relic of ancient belief, having much in common with the notion of magical sympathy. Its second principle is something rational and typically Greek. That is, the emphasis laid by Pythagoras on form or structure as the proper object of study, together with an exaltation of the idea of *limit*. If, as a classical professor recently stated in his inaugural lecture, a characteristic mark of the Greeks is their preference for 'the intelligible, determinate, mensurable, as opposed to the fantastic, vague and shapeless', then Pythagoras was the foremost apostle of the Hellenic spirit. The Pythagoreans, as convinced moral dualists, drew up two columns under the headings of good things and bad things. In the good column, along with light, unity and the male, came limit; in the bad column, with darkness, plurality and the female, is placed the unlimited.

The religion of Pythagoras embodied, as we have seen, a kind of pantheism. The world is divine, it is therefore good, and is a single whole. If it is good, alive and a whole, that is because, said Pythagoras, it is *limited*, and displays an *order* in the relations of its various parts. Full and efficient life depends on organization. We see this in individual living creatures, which we call organisms to indicate that they have all their parts arranged and subordinated to the end of keeping the whole alive (Greek *organon* = tool or instrument). So with the world. The only sense in which it can be called a single whole, as well as good and living, is that it has fixed limits and is therefore capable of organization. The regularity of world-phenomena was thought to support this. Days succeed nights and seasons seasons in due and invariable order. The wheeling stars exhibit (as was thought) eternal and perfectly circular motion. In short the world may be called a *kosmos*, an untranslatable word which combined the notions of order, fitness, and beauty. Pythagoras is said to have been the first to call it by this name.

Pythagoras, being by nature a philosopher, argued that if we want to identify ourselves with the living cosmos, to which we believe ourselves to be essentially akin, then while not neglecting the old religious rules, we must first and foremost study its ways and find out what it is like. This in itself will bring us closer to it, as well as enabling us to conduct our lives in closer conformity to the principles which it reveals. Just as the Universe is a *kosmos*, or ordered whole, so Pythagoras believed that each one of us is a *kosmos* in miniature. We are organisms which reproduce the structural principles of the macrocosm.

And by studying these structural principles, we develop and encourage the elements of form and order in ourselves. The philosopher who studies the *kosmos* becomes *kosmios*—orderly—in his own soul.

Pythagoras's own interests were first and foremost mathematical. It may be taken as established that this does not mean simply a superstitious playing with numbers, but that he made real and considerable advances in mathematics. The discoveries which he made were totally and astonishingly new. If we do not realize how exciting and fresh they must have seemed, we shall not be in a state of mind to sympathize with the extraordinarily wide application which it seemed right to him to give them. We must allow for a remnant of primitive thinking too: we remember what has been said about the savage's irrational confusion between numbers and the objects numbered. But his own remarkable discoveries must have seemed to give irrefutable confirmation, on purely rational grounds, to these earlier ways of thought.

His most striking discovery, and the one which is said to have exercised the widest influence over his thought and to have been the foundation of his mathematical philosophy, was in the field of music. He found out that those intervals of the musical scale which are still (I believe) called the perfect consonances can be expressed arithmetically as ratios between the numbers 1, 2, 3 and 4. These are the numbers which, added together, make 10, and the number 10, in the curious Pythagorean combination of mathematics and mysticism, was called the perfect number. It was illustrated graphically

by the figure called the *tetraktys*, i.e. $\begin{smallmatrix} \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{smallmatrix}$. The octave is produced by the ratio 2 : 1, the fifth 3 : 2, and the fourth 4 : 3. Now if one did not know this, it is not the sort of thing that would occur to one while playing the lyre, and perhaps picking out the notes with a certain amount of trial and error. The discovery lay in the existence of an *inherent* order, a numerical organization within the nature of sound itself, and it appeared as a kind of revelation concerning the nature of the Universe.

The general principle which it was taken to illustrate was that of the imposition of limit (*peras*) on the unlimited (*apeiron*) to make the limited (*peperasmenon*). This was the general Pythagorean formula for the making of the world and all that it contains, and it was coupled with the moral and aesthetic corollary that limit was good and the unlimited evil, so that the imposition of limit and the formation of a *kosmos*, which they claimed to see in the world as a whole, was evidence of the goodness and beauty of the world and an example to be followed by men. Owing to Pythagoras's discovery, music provided for his followers the best instance of this principle at work. Its suitability was enhanced by the *beauty* of music, to which Pythagoras like most Greeks was sensitive, for the word *kosmos* carried to a Greek the suggestion of beauty as well as order. It was thus further evidence for the equation of limit with goodness that its imposition on the field of sound brought beauty out of disharmony. The whole field of sound, then, ranging indefinitely in opposite directions—high and low—is an instance of the unlimited. Limit is represented by the numerical system of ratios between concordant notes which

reduces the whole to order. It is marked out according to an intelligible plan. This plan is not imposed on it by man, but has been there all the time awaiting his discovery. In Cornford's words: 'The infinite variety of quality in sound is reduced to order by the exact and simple law of ratio in quantity. The system so defined still contains the unlimited element in the blank intervals between the notes; but the unlimited is no longer an orderless continuum: it is confined within an order, a *kosmos*, by the imposition of limit or measure.'

This process, grasped here in a single striking instance, the Pythagoreans supposed to be the ruling principle at work in the Universe as a whole. It is here that their cosmology differs essentially from the Ionian type, giving one the right to call it a philosophy of form and theirs a philosophy of matter. They spoke of a mixture of opposites and left it at that. The Pythagoreans added the notions of order, proportion, and measure, i.e. they laid the stress on *quantitative* differences. Each separate thing was what it was not because of its material elements (which were common to all), but because of the proportion in which those elements were mixed; and since it is in this element of proportion that one class of things differs from another, so they argued that this, the law of its structure, was the essential thing to discover if one wanted to understand it. The emphasis is shifted from the matter to the form. Structure is the essential thing, and this structure could be expressed numerically, in terms of quantity. Is it now surprising, considering the inchoate state of philosophy at the time, and the absence of any systematic study of logic or even of grammar, that

they expressed their new-found conviction by saying that 'things were numbers'?

That gives their general line of thought, and we cannot here go into its many individual applications. One, however, may be mentioned as an illustration, and for the powerful influence which it exercised over a very important branch of Greek science, a branch of science in which Greek, and hence ultimately Pythagorean, ideas were still regarded as canonical throughout the Middle Ages and beyond, in the Moslem East as well as in the Christian West. That is, the study of medicine. Limit and order are good, and the well-being of the world and of every creature in it depends on a right mingling (*krasis*) of the elements of which it is composed. It is then in a state of *harmonia*, the word which (in Greek as in English) primarily applied to music being extended to cover the whole field of nature. To the microcosm this doctrine was applied in the theory that bodily health was dependent on the rightly proportioned mixture of the physical opposites: hot and cold, wet and dry. If they are in a state of *harmonia* in the body, then, as the doctor in Plato's *Symposium* puts it, the most mutually hostile elements in it are reconciled and taught to live in amity: 'and by the most hostile I mean the most sharply opposed, as hot to cold, bitter to sweet, dry to wet'. This dogma of the importance of maintaining—or restoring in the case of sickness—the right quantitative relationships between opposite qualities became the corner-stone of Greek medicine, which started in a Pythagorean atmosphere with the work of Alcmaeon of Croton.

Pythagorean notions have had such a long history

in philosophy and literature that other illustrations will easily suggest themselves. I cannot for example go into the doctrine of the harmony of the spheres, against whose appealing but fragile beauty the prosaic mind of Aristotle directed some of its heaviest logical batteries. But at least we have seen something of the field of thought in which such a strange idea was born, and have a glimpse of the world which lay behind the words of Lorenzo to Jessica as they rested on the moonlit bank outside the house of Portia:

Sit, Jessica. Look how the floor of heaven
Is thick inlaid with palines of bright gold.
There's not the smallest orb which thou behold'st
But in his motion like an angel sings,
Still quiring to the young-eyed cherubins.
Such harmony is in immortal souls;
But whilst this muddy vesture of decay
Doth grossly close it in, we cannot hear it.

CHAPTER III

THE PROBLEM OF MOTION

(Heraclitus, Parmenides and the pluralists)

THE next philosopher in the succession is the enigmatic Heraclitus, who earned even in antiquity the nicknames of 'The dark one' and 'The Riddler'. Although the exact dates of his life are unknown, his position in the history of philosophy is fixed well enough by the fact that he criticized Pythagoras by name and is himself fairly obviously alluded to by Parmenides. He must have been at work just about the turn of the sixth and fifth centuries B.C.

If we find him difficult to understand, this is not only because we possess no more than a few fragments of what he actually wrote. He had clearly a haughty and contemptuous mind, and delighted in throwing out isolated oracular sayings rather than developing a patient and continuous line of argument. His method of communication is like that of the Delphic oracle, which, he says, 'neither utters nor hides its meaning, but shows it by a sign'. Nevertheless it is worth trying to get at some of the ideas underlying his disjointed pronouncements. They reveal an interesting stage in the history of thought.

The target of his criticism in Pythagoras and others was their investigation into external nature, their search for facts. 'Polymathy—the learning of many things—does not teach understanding,' he wrote. 'Otherwise it would have taught Hesiod and Pythagoras, Xenophanes and Hecataeus.' Such learning