(for it is part of the mixture). Now even if it happens that the same thing is a
5 principle both as matter and as mover, still *being* them is not the same. In which
respect then is love a principle? It is paradoxical also that strife should be
imperishable; strife is for him the nature of the bad.

Anaxagoras makes the good a motive principle; for thought moves things, but
moves them for the sake of something, which must be something other than it,
10 except according to *our* way of stating the case; for the medical art is in a sense
health. It is paradoxical also not to suppose a contrary to the good, i.e. to thought.
But all who speak of the contraries make no use of the contraries, unless we bring
their views into shape. And why some things are perishable and others imperish-
able, no one tells us; for they make all existing things out of the same principles.
15 Further, some make existing things out of the non-existent, and others to avoid the
necessity of this make all things one.

Further, why should there always be becoming, and what is the cause of
becoming?—this no one tells us. And those who suppose two principles must
suppose another, a superior principle, and so must those who believe in the Forms;
for why did things come to participate, or why do they participate, in the Forms?
And all other thinkers are confronted by the necessary consequence that there is
20 something contrary to Wisdom, i.e. to the highest knowledge; but *we* are not. For
there is nothing contrary to that which is primary (for all contraries have matter
and are potentially); and the ignorance which is contrary would lead us to a
contrary object; but what is primary has no contrary.

Again, if besides sensible things no others exist, there will be no first principle,
25 no order, no becoming, no heavenly bodies, but each principle will have a principle
before it, as in the accounts of the mythologists and all the natural philosophers. But
if the Forms or the numbers are to exist, they will be causes of nothing; or if not that,
at least not of movement.

Further, how is extension, i.e. a *continuum*, to be produced out of unextended
30 parts? For number will not, either as mover or as form, produce a *continuum*. But
again there cannot be any contrary that is also a productive or moving principle; for
it would be possible for it not to be. Or at least its action would be posterior to its
capacity. The world then would not be eternal. But it is; one of these premises, then,
must be denied. And we have said how this must be done. Further, in virtue of what
35 the numbers, or the soul and the body, or in general the form and the thing, are
one—of this no one tells us anything; nor can any one tell, unless he says, as we do,
that the mover makes them one. And those who say mathematical number is first
and go on to generate one kind of substance after another and give different
76ᵃ1 principles for each, make the substance of the universe a series of episodes (for one
substance has no influence on another by its existence or non-existence), and they
give us many principles; but the world must not be governed badly.

'The rule of many is not good; let there be one ruler.'[5]

⁵*Iliad* II 204.

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BOOK XIII (M)

1 · We have stated what is the substance of sensible things, dealing in the
treatise on physics with matter, and later with the substance which has actual
existence. Now since our inquiry is whether there is or is not besides the sensible
10 substances any which is immovable and eternal, and, if there is, what it is, we must
first consider what is said by others, so that, if there is anything which they say
wrongly, we may not be liable to the same objections, while, if there is any opinion
common to them and us, we shall not quarrel with ourselves on that account; for one
15 must be content to state some points better than one's predecessors, and others no
worse.

Two opinions are held on this subject; it is said that the objects of mathemat-
ics—i.e. numbers and lines and the like—are substances, and again that the Ideas
are substances. And since some recognize these as two different classes—the Ideas
and the mathematical numbers—and some recognize both as having one nature,
20 while some others say that the mathematical substances are the only substances, we
must consider first the objects of mathematics, not qualifying them by any other
characteristic—not asking, for instance, whether they are Ideas or not, or whether
they are the principles and substances of existing things or not, but only whether as
25 the objects of mathematics they exist or not, and if they do, how they exist; then
after this we must separately consider the Ideas themselves in a general way, and
only as far as systematic treatment demands; for most of what we have to say has
been repeatedly stated in popular works. And the greater part of our account must
30 attack the inquiry already mentioned, viz. whether the substances and the princi-
ples of existing things are numbers and Ideas; for after the discussion of the Ideas
this remains as a third inquiry.

If the objects of mathematics exist, then they must exist either in sensible
objects, as some say, or separate from sensible objects (and this also is said by
35 some), or if they exist in neither of these ways, either they do not exist, or they exist
in some other way. So that the subject of our discussion will be not whether they
exist but how they exist.

2 · That it is impossible for mathematical objects to exist *in* sensible things
and at the same time that the doctrine in question is a fanciful one, has been said
1076ᵇ1 already in our discussion of difficulties,—the reasons being that it is impossible for
two solids to be in the same place, and that according to the same argument all the
other powers and characteristics also should exist in sensible things—none of them
existing separately. This we have said already. But, further, it is obvious that on this
5 theory it is impossible for any body whatever to be divided; for it would have to be
divided at a plane, and the plane at a line, and the line at a point, so that if the point
cannot be divided, neither can the line, and if the line cannot, neither can the plane
nor the solid. What difference then does it make whether sensible things are of this
10 kind, or, without being so themselves, have such things in them? The result will be

the same; if the sensible things are divided the others will be divided too, or else not even the sensible things can be divided.

But, again, it is not possible that such entities should exist *separately*. For if besides the sensible solids there are to be other solids which are separate from them and prior to the sensible solids, it is plain that besides the planes also there must be other and separate planes and points and lines; for consistency requires this. But if these exist, again besides the planes and lines and points of the mathematical solid there must be others which are separate. For the incomposite is prior to the compound; and if there are, prior to the sensible bodies, bodies which are not sensible, by the same argument the planes which exist by themselves must be prior to those which are in the motionless solids. Therefore these will be planes and lines other than those that exist along with the separate mathematical solids; for the latter exist along with the mathematical solids, while the others are prior to the mathematical solids. Again, there will be, belonging to these planes, lines, and prior to them there will have to be, by the same argument, other lines and points; and prior to these points in the prior lines there will have to be other points, though there will be no others prior to these. Now the accumulation becomes absurd; for we find ourselves with one set of solids apart from the sensible solids; three sets of planes apart from the sensible planes—those which exist apart from the sensible planes, and those in the mathematical solids, and those which exist apart from those in the mathematical solids; four sets of lines, and five sets of points. With which of these, then, will the mathematical sciences deal? Certainly not with the planes and lines and points in the motionless solid; for science always deals with what is prior. And the same account will apply also to numbers; for there will be another set of units apart from each set of points, and also apart from each set of realities, from the objects of sense and again from those of thought; so that there will be various classes of mathematical numbers.

Again, how is it possible to solve the questions which we enumerated in our discussion of difficulties? For besides the sensible things there will be, on similar principles, the things with which astronomy and those with which geometry deals; but how is it possible that a heaven and its parts—or indeed anything which has movement—should exist apart from the sensible heaven? Similarly also the objects of optics and harmonics will exist apart; for there will be voice and sight besides the sensible or individual voices and sights. Therefore it is plain that the other senses as well, and the other objects of sense, will exist apart; for why should one set of them do so and another not? And if this is so, animals also will exist apart, since the senses will.

Again, there are certain mathematical theorems of a universal character, extending beyond these substances. Here then we shall have another substance intermediate between, and separate from, the Ideas and the intermediates,—a substance which is neither number nor points nor spatial magnitude nor time. And if this is impossible, plainly it is also impossible that the *former* substances should exist separate from sensible things.

And, in general, conclusions contrary alike to the truth and to the usual views

follow, if one supposes the objects of mathematics to exist thus as separate entities. For if they exist thus they must be prior to sensible spatial magnitudes, but in truth they must be posterior; for the incomplete spatial magnitude is in the order of generation prior, but in the order of substance posterior, as the lifeless is to the living.

Again, what in the world[1] will make mathematical magnitudes one? For things in our perceptible world are one in virtue of soul, or of a part of soul, or of something else, reasonably enough; when these are not present, the thing is a plurality, and splits up into parts. But in the case of the objects of mathematics, which are divisible and are quantities, what is the cause of their being one and holding together?

Again, the modes of generation of the objects of mathematics show that we are right. For the dimension first generated is length, then comes breadth, lastly depth, and the process is complete. If, then, that which is posterior in the order of generation is prior in the order of substance, body will be prior to the plane and the line. And in *this* way also it is more complete and more whole, because it can become animate. How, on the other hand, could a line or a plane be animate? The supposition passes the power of our senses.

Again, body is a sort of substance; for it already has in a sense completeness. But how can lines be substances? Neither as a form or shape, as the soul perhaps is, nor as matter, like body; for we have no experience of anything that can be put together out of lines or planes or points, while if these had been a sort of material substance, we should have observed things which could be put together out of them.

Grant that they are prior in formula. Still not all things which are prior in formula are prior in substance. For those things are prior in substance which when separated from other things continue to exist, but those are prior in formula out of whose formulae the formulae of other things are compounded; and these two properties are not co-extensive. For if attributes, such as moving or white, do not exist apart from their substances, the white is prior to the white man in formula, but not in substance. For it cannot exist separately, but is always along with the compound thing; and by the compound thing I mean the white man. Therefore it is plain that neither is the result of abstraction prior nor that which is produced by adding posterior; for it is by adding to the white that we speak of the white man.

It has, then, been sufficiently pointed out that the objects of mathematics are not substances in a higher sense than bodies are, and that they are not prior to sensibles in being, but only in formula, and that they cannot in any way exist separately. But since they could not exist *in* sensibles either, it is plain that they either do not exist at all or exist in a special way and therefore do not exist without qualification. For 'exist' has many senses.

3 · Just as the universal part of mathematics deals not with objects which exist separately, apart from magnitudes and from numbers, but with magnitudes

'Reading πoτ' for πότ'.

20 and numbers, not however *qua* such as to have magnitude or to be divisible, clearly it is possible that there should also be both formulae and demonstrations about sensible magnitudes, not however *qua* sensible but *qua* possessed of certain definite qualities. For as there are many formulae about things merely considered as in motion, apart from the essence of each such thing and from their accidents, and as it

25 is not therefore necessary that there should be either something in motion separate from sensibles, or a separate substance in the sensibles, so too in the case of moving things there will be formulae and sciences which treat them not *qua* moving but only *qua* bodies, or again only *qua* planes, or only *qua* lines, or *qua* divisibles, or *qua*

30 indivisibles having position, or only *qua* indivisibles.

Thus since it is true to say without qualification that not only things which are separable but also things which are inseparable exist—for instance, that moving things exist,—it is true also to say, without qualification, that the objects of mathematics exist, and with the character ascribed to them by mathematicians. And it is true to say of the other sciences too, without qualification, that they deal

35 with such and such a subject—not with what is accidental to it (e.g. not with the white, if the white thing is healthy, and the science has the healthy as its subject),

78ª1 but with that which is the subject of each science—with the healthy if it treats things *qua* healthy, with man if *qua* man. So too is it with geometry; if its subjects happen to be sensible, though it does not treat them *qua* sensible, the mathematical sciences will not for that reason be sciences of sensibles—nor, on the other hand, of other things separate from sensibles.

5 Many properties attach to things in virtue of their own nature as possessed of some such property; e.g. there are attributes peculiar to the animal *qua* female or *qua* male, yet there is no female nor male separate from animals. And so also there are attributes which belong to things merely as lengths or as planes. And in proportion as we are dealing with things which are prior in formula and simpler, our

10 knowledge will have more accuracy, i.e. simplicity. Thus a science which abstracts from the magnitude of things is more precise than one which takes it into account; and a science is most precise if it abstracts from movement, but if it takes account of movement, it is most precise if it deals with the primary movement, for this is the simplest; and of this again uniform movement is the simplest form. The same account may be given of harmonics and optics; for neither considers its objects *qua*

15 light-ray or *qua* voice, but *qua* lines and numbers; but the latter are attributes proper to the former. And mechanics too proceeds in the same way. Thus if we suppose things separated from their attributes and make any inquiry concerning them as such, we shall not for this reason be in error, any more than when one draws

20 a line on the ground and calls it a foot long when it is not; for the error is not included in the propositions.

Each question will be best investigated in this way—by supposing separate what is not separate, as the arithmetician and the geometer do. For a man *qua* man is one indivisible thing; and the arithmetician supposes one indivisible thing, and

25 then considers whether any attribute belongs to a man *qua* indivisible. But the geometer treats him neither *qua* man nor *qua* indivisible, but as a solid. For

evidently the attributes which would have belonged to him even if he had not been indivisible, can belong to him apart from these attributes. Thus, then, geometers speak correctly—they talk about existing things, and their subjects do exist; for being has two forms—it exists not only in fulfillment but also as matter. 30

Now since the good and the beautiful are different (for the former always implies conduct as its subject, while the beautiful is found also in motionless things), those who assert that the mathematical sciences say nothing of the beautiful or the good are in error. For these sciences say and prove a very great deal about them; for if they do not expressly mention them, but prove attributes which are their results or 35 their formulae, it is not true to say that they tell us nothing about them. The chief forms of beauty are order and symmetry and definiteness, which the mathematical 1078ᵇ1 sciences demonstrate in a special degree. And since these (e.g. order and definiteness) are obviously causes of many things, evidently these sciences must treat this sort of cause also (i.e. the beautiful) as in some sense a cause. But we shall 5 speak more plainly elsewhere about these matters.

4 · So much then for the objects of mathematics; we have said that they exist and in what sense they exist, and in what sense they are prior and in what sense not prior. Now, regarding the Ideas, we must first examine the ideal theory by itself, not connecting it in any way with the nature of numbers, but treating it in the form in 10 which it was originally understood by those who first maintained the existence of Ideas. The supporters of the ideal theory were led to it because they were persuaded of the truth of the Heraclitean doctrine that all sensible things are ever passing away, so that if knowledge or thought is to have an object, there must be some other 15 and permanent entities, apart from those which are sensible; for there can be no knowledge of things which are in a state of flux. Socrates occupied himself with the excellences of character, and in connection with them became the first to raise the problem of universal definitions—for of the natural scientists, only Democritus touched on the matter and defined, after a fashion, the hot and the cold; while the 20 Pythagoreans had before this treated of a few things, whose formulae they connected with numbers—e.g. opportunity, justice, or marriage. But it was natural that Socrates should seek the essence. For he was seeking to deduce, and the essence is the starting-point of deductions. For there was as yet none of the dialectical power 25 which enables people even without knowledge of the essence to speculate about contraries and inquire whether the same science deals with contraries. For two things may be fairly ascribed to Socrates—inductive arguments and universal definition, both of which are concerned with the starting-point of science. But Socrates did not make the universals or the definitions exist apart; his successors, 30 however, gave them separate existence, and this was the kind of thing they called Ideas.

Therefore it followed for them, almost by the same argument, that there must be Ideas of all things that are spoken of universally, and it was almost as if a man wished to count certain things, and while they were few thought he would not be 35 able to count them, but made them more and then counted them; for the Forms are