The Basic Works of

ARISTOTLE

EDITED AND WITH AN INTRODUCTION BY

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BIBLIOGRAPHY

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CATEGORICA (Categories) (complete)

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RHETORICA (On the Art of Rhetoric) (complete)

Kunsthistorisches Museum, Vienna

ARISTOTLE

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form, whether it is one or many and what it is or what they are, is the province of the primary type of science; so these questions may stand over till then. But of the natural, i.e. perishable, forms we shall speak in the expositions which follow.

The above, then, may be taken as sufficient to establish that there are principles and what they are and how many there are. Now let us make a fresh start and proceed.

**BOOK II**

1. Of things that exist, some exist by nature, some from other causes. ‘By nature’ the animals and their parts exist, and the plants and the simple bodies (earth, fire, air, water)—for we say that these and the like exist ‘by nature’.

All the things mentioned present a feature in which they differ from things which are not constituted by nature. Each of them has within itself a principle of motion and of stationariness (in respect of place, or of growth and decrease, or by way of alteration). On the other hand, a bed and a coat and anything else of that sort, qua receiving these designations—i.e. in so far as they are products of art—have no innate impulse to change. But in so far as they happen to be composed of stone or of earth or of a mixture of the two, they do have such an impulse, and just to that extent—which seems to indicate that nature is a cause or cause of being moved and of being at rest in that to which it belongs primarily, in virtue of itself and not in virtue of a concomitant attribute.

I say ‘not in virtue of a concomitant attribute’, because (for instance) a man who is a doctor might cure himself. Nevertheless it is not in so far as he is a patient that he possesses the art of medicine: it merely has happened that the same man is doctor and patient—and that is why these attributes are not always found together. So it is with all other artificial products. None of them has in itself the source of its own production. But while in some cases (for instance houses and the other products of manual labour) that principle is in something else external to the thing, in others—those which may cause a change in themselves in virtue of a concomitant attribute—it lies in the things themselves (but not in virtue of what they are).

‘Nature’ then is what has been stated. Things ‘have a nature’ which have a principle of this kind. Each of them is a substance; for it is a subject, and nature always implies a subject in which it inheres.

The term ‘according to nature’ is applied to all these things and

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... also to the attributes which belong to them in virtue of what they are, for instance the property of fire to be carried upwards—which is not a ‘nature’ nor ‘has a nature’ but is ‘by nature’ or ‘according to nature’.

What nature is, then, and the meaning of the terms ‘by nature’ and ‘according to nature’, has been stated. That nature exists, it would be absurd to try to prove; for it is obvious that there are many things of this kind, and to prove what is obvious by what is not is the mark of a man who is unable to distinguish what is self-evident from what is not. (This state of mind is clearly possible. A man blind from birth might reason about colours. Presumably therefore such persons must be talking about words without any thought to correspond.)

Some identify the nature or substance of a natural object with that immediate constituent of it which taken by itself is without arrangement, e.g. the wood is the ‘nature’ of the bed, and the bronze the ‘nature’ of the statue.

As an indication of this Antiphon points out that if you planted a bed and the rotting wood acquired the power of sending up a shoot, it would not be a bed that would come up, but wood—which shows that the arrangement in accordance with the rules of the art is merely an incidental attribute, whereas the real nature is the other, which, further, persists continuously through the process of making.

But if the material of each of these objects has itself the same relation to something else, say bronze (or gold) to water, bones (or wood) to earth and so on, that (they say) would be their nature and essence. Consequently some assert earth, others fire or air or water or some or all of these, to be the nature of the things that are. For whatever any one of them supposed to have this character—whether one thing or more than one thing—this or these he declared to be the whole of substance, all else being its affections, states, or dispositions. Every such thing they held to be eternal (for it could not pass into any-thing else), but other things to come into being and cease to be times without number.

This then is one account of nature’, namely that it is the immediate material substratum of things which have in themselves a principle of motion or change.

Another account is that ‘nature’ is the shape or form which is specified in the definition of the thing.

For the word ‘nature’ is applied to what is according to nature and the natural in the same way as ‘art’ is applied to what is artistic or a work of art. We should not say in the latter case that there is anything artistic about a thing, if it is a bed only potentially, not yet
having the form of a bed; nor should we call it a work of art. The
same is true of natural compounds. What is potentially flesh or bone
has not yet its own ‘nature’, and does not exist ‘by nature’, until it
receives the form specified in the definition, which we name in defin-
ing what flesh or bone is. Thus in the second sense of ‘nature’ it
would be the shape or form (not separable except in statement) of
things which have in themselves a source of motion. (The com-

bination of the two, e.g. man, is not ‘nature’ but ‘by nature’ or
‘natural’.)

The form indeed is ‘nature’ rather than the matter; for a thing is
more properly said to be what it is when it has attained to fulfilment
than when it exists potentially. Again man is born from man, but
not bed from bed. That is why people say that the figure is not the
nature of a bed, but the wood is—if the bed sprouted not a bed but
wood would come up. But even if the figure is art, then on the same
principle the shape of man is his nature. For man is born from man.

We also speak of a thing’s nature as being exhibited in the process
of growth by which its nature is attained. The ‘nature’ in this sense
is not like ‘doctoring’, which leads not to the art of doctoring but to
health. Doctoring must start from the art, not lead to it. But it is
not in this way that nature (in the one sense) is related to nature
(in the other). What grows qua growing grows from something into
something. Into what then does it grow? Not into that from which
it arose but into that to which it tends. The shape then is nature.
‘Shape’ and ‘nature’, it should be added, are used in two senses.

For the privation too is in a way form. But whether in unqualified
coming to be there is privation, i.e. a contrary to what comes to be,
we must consider later.¹

² We have distinguished, then, the different ways in which the term
‘nature’ is used.

The next point to consider is how the mathematician differs from
the physicist. Obviously physical bodies contain surfaces and volumes,
lines and points, and these are the subject-matter of mathematics.

Further, is astronomy different from physics or a department of it?
It seems absurd that the physicist should be supposed to know the
nature of sun or moon, but not to know any of their essential attrib-
utes, particularly as the writers on physics obviously do discuss
their shape also and whether the earth and the world are spherical
or not.

Now the mathematician, though he too treats of these things,

² I.e. death.
sake of which he was born'. For not every stage that is last claims to be an end, but only that which is best.

For the arts make their material (some simply 'make' it, others make it serviceable), and we use everything as if it was there for our sake. (We also are in a sense an end, 'That for the sake of which' has two senses: the distinction is made in our work On Philosophy.\(^3\)) The arts, therefore, which govern the matter and have knowledge of it, are two, namely the art which uses the product and the art which directs the production of it. That is why the using art also is in a sense directive; but it differs in that it knows the form, whereas the art which is directive as being concerned with production knows the matter. For the helmsman knows and prescribes what sort of form a helm should have, the other from what wood it should be made and by means of what operations. In the products of art, however, we make the material with a view to the function, whereas in the products of nature the matter is there all along.

Again, matter is a relative term: to each form there corresponds a special matter. How far then must the physicist know the form or essence? Up to a point, perhaps, as the doctor must know sénè or the smith bronze (i.e. until he understands the purpose of each): and the physicist is concerned only with things whose forms are separable indeed, but do not exist apart from matter. Man is begotten by man and by the sun as well. The mode of existence and essence of the separable it is the business of the primary type of philosophy to define.

Now that we have established these distinctions, we must proceed to consider causes, their character and number. Knowledge is the object of our inquiry, and men do not think they know a thing till they have grasped the 'why' of it (which is to grasp its primary cause). So clearly we too must do this as regards both coming to be and passing away and every kind of physical change, in order that, knowing their principles, we may try to refer to these principles each of our problems.

In one sense, then, (1) that out of which a thing comes to be and which persists, is called 'cause', e.g. the bronze of the statue, the silver of the bowl, and the genera of which the bronze and the silver are species. \(^3\) i.e. in the dialogue De Philosophia.

In another sense (2) the form or the archetype, i.e. the statement of the essence, and its genera, are called 'causes' (e.g. of the octave the relation of 2:1, and generally number), and the parts in the definition. \(^3\) i.e. in the dialogue De Philosophia.

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Again (3) the primary source of the change or coming to be is evident, e.g. the man who gave advice is a cause, the father is cause of the child, and generally what makes of what is made and what causes change of what is changed. Efficient

Again (4) in the sense of end or that for the sake of which a thing is done, e.g. health is the cause of walking about. ('Why is he walking about?' we say. 'To be healthy', and, having said that, we think we have assigned the cause.) The same is true also of all the intermediate steps which are brought about through the action of something else as means towards the end, e.g. reduction of flesh, purging, drugs, or surgical instruments are means towards health. All these things are for the sake of the end, though they differ from one another in that some are activities, others instruments.

This then perhaps exhausts the number of ways in which the term 'cause' is used.

As the word has several senses, it follows that there are several causes of the same thing (not merely in virtue of a concomitant attribute), e.g. both the art of the sculptor and the bronze are causes of the statue. These are causes of the statue qua statue, not in virtue of anything else that it may be—only not in the same way, the one being the material cause, the other the cause whence the motion comes. Some things cause each other reciprocally, e.g. hard work causes fitness and vice versa, but again not in the same way, but the one as end, the other as the origin of change. Further the same thing is the cause of contrary results. For that which by its presence brings about one result is sometimes blamed for bringing about the contrary by its absence. Thus we ascribe the wreck of a ship to the absence of the pilot whose presence was the cause of its safety.

All the causes now mentioned fall into four familiar divisions. The letters are the causes of syllables, the material of artificial products, fire, &c., of bodies, the parts of the whole, and the premises of the conclusion, in the sense of 'that from which'. Of these pairs the one set are causes in the sense of substratum, e.g. the parts, the other set in the sense of essence—the whole and the combination and the form. But the seed and the doctor and the adviser, and generally the maker, are all sources whence the change or stationariness originates, while the others are causes in the sense of the end or the good of the rest; for 'that for the sake of which' means what is best and the end of the things that lead up to it. (Whether we say the 'good itself' or the 'apparent good' makes no difference.)

Such then is the number and nature of the kinds of cause.

Now the modes of causation are many, though when brought under
heads they too can be reduced in number. For 'cause' is used in
many senses and even within the same kind one may be prior to an-
other (e.g. the doctor and the expert are causes of health, the relation
$2 : 1$ and number of the octave), and always what is inclusive to what
is particular. Another mode of causation is the incidental and its
genera, e.g. in one way 'Polycitus', in another 'sculptor' is the cause
of a statue, because 'being Polycitus' and 'sculptor' are incidentally
conjoined. Also the cases in which the incidental attribute is in-
cluded; thus a 'man' could be said to be the cause of a statue or,
generally, 'a living creature'. An incidental attribute too may be
more or less remote, e.g. suppose that 'a pale man' or 'a musical man'
were said to be the cause of the statue.

All causes, both proper and incidental, may be spoken of either as
potential or as actual; e.g. the cause of a house being built is either
'house-builder' or 'house-builder building'.

Similar distinctions can be made in the things of which the causes
are causes, e.g. of 'this statue' or of 'statue' or of 'image' generally,
of 'this bronze' or of 'bronze' or of 'material' generally. So too with
the incidental attributes. Again we may use a complex expression
for either and say, e.g. any of Polycitus or not Polycitus but Polyc-
itus, sculptor.

All these various uses, however, come to six in number, under each
of which again the usage is twofold. Cause means either what is par-
ticular or a genus, or an incidental attribute or a genus of that, and
these either as a complex or each by itself; and all six either as actual
or as potential. The difference is this much, that causes which are
actually at work and particular exist and cease to exist simultaneously
with their effect, e.g. this healing person with this being-healed per-
son and that housebuilding man with that being-built house; but this
is not always true of potential causes—the house and the housebuild-
do not pass away simultaneously.

In investigating the cause of each thing it is always necessary to
seek what is most precise (as also in other things): thus man builds
because he is a builder, and a builder builds in virtue of his art of
building. This last cause then is prior: and so generally.

Further, generic effects should be assigned to generic causes, par-
ticular effects to particular causes, e.g. statue to sculptor, this statue
to this sculptor; and powers are relative to possible effects, actually
operating causes to things which are actually being effected.

This must suffice for our account of the number of causes and the
modes of causation.

But chance also and spontaneity are reckoned among causes:
many things are said both to be and to come to be as a result of
chance and spontaneity. We must inquire therefore in what manner
chance and spontaneity are present among the causes enumerated, and
whether they are the same or different, and generally what chance and
spontaneity are.

Some people even question whether they are real or not. They say
that nothing happens by chance, but that everything which we ascribe
to chance or spontaneity has some definite cause, e.g. coming 'by
chance' into the market and finding there a man whom one wanted
but did not expect to meet is due to one's wish to go and buy in the
market. Similarly in other cases of chance it is always possible, they
maintain, to find something which is the cause; but not chance, for if
chance were real, it would seem strange indeed, and the question
might be raised, why on earth none of the wise men of old in speaking
of the causes of generation and decay took account of chance; whence
it would seem that they too did not believe that anything is by
chance. But there is a further circumstance which is surprising. Many
things both come to be and are by chance and spontaneity, and al-
though all know that each of them can be ascribed to some cause
(as the old argument said which denied chance), nevertheless they
speak of some of these things as happening by chance and others
not. For this reason also they ought to have at least referred to the
matter in some way or other.

Certainly the early physicists found no place for chance among
the causes which they recognized—love, strife, mind, fire, or the like.
This is strange, whether they supposed that there is no such thing
as chance or whether they thought there is but omitted to mention
it—and that too when they sometimes used it, as Empedocles does
when he says that the air is not always separated into the highest
region, but 'as it may chance'. At any rate he says in his cosmogony
that 'it happened to run that way at that time, but it often ran oth-
erwise.' He tells us also that most of the parts of animals came to be
by chance.

There are some too who ascribe this heavenly sphere and all the
worlds to spontaneity. They say that the vortex arose spontaneously,
i.e. the motion that separated and arranged in its present order all
that exists. This statement might well cause surprise. For they are
asserting that chance is not responsible for the existence or genera-
tion of animals and plants, nature or mind or something of the kind.

4 Apparently Democritus is meant.
5 Apparently Democritus is meant.
being the cause of them (for it is not any chance thing that comes from a given seed but an olive from one kind and a man from another); and yet at the same time they assert that the heavenly sphere and the divinest of visible things arose spontaneously, having no such cause as is assigned to animals and plants. Yet if this is so, it is a fact which deserves to be dwelt upon, and something might well have been said about it. For besides the other absurdities of the statement, it is the more absurd that people should make it when they see nothing coming to be spontaneously in the heavens, but much happening by chance among the things which as they say are not due to chance; whereas we should have expected exactly the opposite.

Others there are who, indeed, believe that chance is a cause, but that it is inscrutable to human intelligence, as being a divine thing full of mystery.

Thus we must inquire what chance and spontaneity are, whether they are the same or different, and how they fit into our division of causes.

First then we observe that some things always come to pass in the same way, and others for the most part. It is clearly of neither of these that chance is said to be the cause, nor can the ‘effect of chance’ be identified with any of the things that come to pass by necessity and always, or for the most part. But as there is a third class of events besides these two—events which all say are ‘by chance’—it is plain that there is such a thing as chance and spontaneity; for we know that things of this kind are due to chance and that things due to chance are of this kind.

But, secondly, some events are for the sake of something, others not. Again, some of the former class are in accordance with deliberate intention, others not, but both are in the class of things which are for the sake of something. Hence it is clear that even among the things which are outside the necessary and the normal, there are some in connexion with which the phrase ‘for the sake of something’ is applicable. (Events that are for the sake of something include whatever may be done as a result of thought or of nature.) Things of this kind, then, when they come to pass incidentally are said to be ‘by chance’.

For just as a thing is something either in virtue of itself or incidentally, so may it be a cause. For instance, the housebuilding faculty is in virtue of itself the cause of a house, whereas the pale or the musical

Democritus.

Incidental attributes of the housebuilder.
tion whether any incidental fact might be the cause of the chance occurrence, e.g. of health the fresh air or the sun’s heat may be the cause, but having had one’s hair cut cannot; for some incidental causes are more relevant to the effect than others.)

25 Chance or fortune is called ‘good’ when the result is good, ‘evil’ when it is evil. The terms ‘good fortune’ and ‘ill fortune’ are used when either result is of considerable magnitude. Thus one who comes within an ace of some great evil or great good is said to be fortunate or unfortunate. The mind affirms the presence of the attribute, ignoring the breadth of difference. Further, it is with reason that good fortune is regarded as unstable; for chance is unstable, as none of the things which result from it can be variable or normal.

30 Both are then, as I have said, incidental causes—both chance and spontaneity—in the sphere of things which are capable of coming to pass not necessarily, nor normally, and with reference to such of these as might come to pass for the sake of something.

6 They differ in that ‘spontaneity’ is the wider term. Every result of chance is from what is spontaneous, but not everything that is from what is spontaneous is from chance.

197 Chance and what results from chance are appropriate to agents that are capable of good fortune and of moral action generally. Therefore necessarily chance is in the sphere of moral actions. This is indicated by the fact that good fortune is thought to be the same, or nearly the same, as happiness, and happiness to be a kind of moral action, since it is well-doing. Hence what is not capable of moral action cannot do anything by chance. Thus an inanimate thing or a lower animal or a child cannot do anything by chance, because it is incapable of deliberate intention; nor can ‘good fortune’ or ‘ill fortune’ be ascribed to them, except metaphorically, as Protarchus, for example, said that the stones of which altars are made are fortunate because they are held in honour, while their fellows are trodden under foot. Even these things, however, can in a way be affected by chance, when one who is dealing with them does something to them by chance, but not otherwise.

9 The spontaneous on the other hand is found both in the lower animals and in many inanimate objects. We say, for example, that the horse came ‘spontaneously’, because, though his coming saved him, he did not come for the sake of safety. Again, the tripod fell ‘of itself’, because, though when it fell it stood on its feet so as to serve for a seat, it did not fall for the sake of that.

Hence it is clear that events which (1) belong to the general class of things that may come to pass for the sake of something, (2) do not come to pass for the sake of what actually results, and (3) have an external cause, may be described by the phrase ‘from spontaneity’. These ‘spontaneous’ events are said to be ‘from chance’ if they have the further characteristics of being the objects of deliberate intention and due to agents capable of that mode of action. This is indicated by the phrase ‘in vain’, which is used when B, which is for the sake of B, does not result in B. For instance, taking a walk is for the sake of evacuation of the bowels; if this does not follow after walking, we say that we have walked ‘in vain’ and that the walking was ‘vain’. This implies that what is naturally the means to an end is ‘in vain’, when it does not effect the end towards which it was the natural means—for it would be absurd for a man to say that he had bathed in vain because the sun was not eclipsed, since the one was not done with a view to the other. Thus the spontaneous is even according to its derivation the case in which the thing itself happens in vain. The stone that struck the man did not fall for the purpose of striking him; therefore it fell spontaneously, because it might have fallen by the action of an agent and for the purpose of striking. The difference between spontaneity and what results by chance is greatest in things that come to be by nature; for when anything comes to be contrary to nature, we do not say that it came to be by chance, but by spontaneity. Yet strictly this too is different from the spontaneous proper; for the cause of the latter is external, that of the former internal.

We have now explained what chance is and what spontaneity is, and in what they differ from each other. Both belong to the mode of causation ‘source of change’, for either some natural or some intelligent agent is always the cause; but in this sort of causation the number of possible causes is infinite.

Spontaneity and chance are causes of effects which, though they might result from intelligence or nature, have in fact been caused by something incidentally. Now since nothing which is incidental is prior to what is per se, it is clear that no incidental cause can be prior to a cause per se. Spontaneity and chance, therefore, are posterior to intelligence and nature. Hence, however true it may be that the heavens are due to spontaneity; it will still be true that intelligence and nature will be prior causes of this All and of many things in it besides.

7 It is clear then that there are causes, and that the number of them is what we have stated. The number is the same as that of the
things comprehended under the question 'why'. The 'why' is referred ultimately either (1), in things which do not involve motion, e.g. in mathematics, to the 'what' (to the definition of 'straight line' or 'commensurable', &c.), or (2) to what initiated a motion, e.g. 'why did they go to war?—because there had been a raid'; or (3) we are inquiring 'for the sake of what?'—'that they may rule'; or (4), in the case of things that come into being, we are looking for the matter. The causes, therefore, are these and so many in number.

Now, the causes being four, it is the business of the physicist to know about them all, and if he refers his problems back to all of them, he will assign the 'why' in the way proper to his science—this, the matter, the form, the mover, 'that for the sake of which'. The last three often coincide; for the 'what' and 'that for the sake of which' are one, while the primary source of motion is the same in species as these (for man generates man), and so too, in general, are all things which cause movement by being themselves moved; and such as are not of this kind are no longer inside the province of physics, for they cause motion not by possessing motion or a source of motion in themselves, but being themselves incapable of motion. Hence there are three branches of study, one of things which are incapable of motion, the second of things in motion, but indestructible, the third of destructible things.

The question 'why', then, is answered by reference to the matter, to the form, and to the primary moving cause. For in respect of coming to be it is mostly in this last way that causes are investigated—'what comes to be after what? what was the primary agent or patient?' and so at each step of the series.

Now the principles which cause motion in a physical way are two, of which one is not physical, as it has no principle of motion in itself. Of this kind is whatever causes movement, not being itself moved, such as (1) that which is completely unchangeable, the primary reality, and (2) the essence of that which is coming to be, i.e. the form; for this is the end or 'that for the sake of which'. Hence since nature is for the sake of something, we must know this cause also. We must explain the 'why' in all the senses of the term, namely, (1) that from this will necessarily result ('from this' either without qualification or in most cases); (2) that 'this must be so if that is to be so' (as the conclusion presupposes the premises); (3) that this was the essence of the thing; and (4) because it is better thus (not without qualification, but with reference to the essential nature in each case).

8 We must explain then (1) that Nature belongs to the class of causes which act for the sake of something; (2) about the necessary and its place in physical problems, for all writers ascribe things to this cause, arguing that since the hot and the cold, &c., are of such and such a kind, therefore certain things necessarily are and come to be—and if they mention any other cause (one, his 'friendship and strife', another, his 'mind'), it is only to touch on it, and then goodbye to it.

A difficulty presents itself: why should nature work, not for the sake of something, nor because it is better so, but just as the sky rains, not in order to make the corn grow, but of necessity? What is drawn up must cool, and what has been cooled must become water and descend, the result of this being that the corn grows. Similarly if a man's crop is spoiled on the threshing-floor, the rain did not fall for the sake of this—in order that the crop might be spoiled—but that result just followed. Why then should it not be the same with the parts in nature, e.g. that our teeth should come up of necessity—the front teeth sharp, fitted for tearing, the molars broad and useful for grinding down the food—since they did not arise for this end, but it was merely a coincident result; and so with all other parts in which we suppose that there is purpose? Wherever then all the parts came about just what they would have been if they had come to be for an end, such things survived, being organized spontaneously in a fitting way; whereas those which grew otherwise perished and continue to perish, as Empedocles says his 'man-faced ox-progeny' did.

Such are the arguments (and others of the kind) which may cause difficulty on this point. Yet it is impossible that this should be the true view. For teeth and all other natural things either invariably or normally come about in a given way; but of not one of the results of chance or spontaneity is this true. We do not ascribe to chance or mere coincidence the frequency of rain in winter, but frequent rain in summer we do; nor heat in the dog-days, but only if we have it in winter. If then, it is agreed that things are either the result of coincidence or for an end, and these cannot be the result of coincidence or spontaneity, it follows that they must be for an end; and that such things are all due to nature even the champions of the theory which is before us would agree. Therefore action for an end is present in things which come to be and are by nature.

Further, where a series has a completion, all the preceding steps are for the sake of that. Now surely as in intelligent action, so in nature; and as in nature, so it is in each action, if nothing interferes.

9 Empedocles.

10 Anaxagoras.
Now intelligent action is for the sake of an end; therefore the nature of things also is so. Thus if a house, e.g., had been a thing made by nature, it would have been made in the same way as it is now by art; and if things made by nature were made also by art, they would come to be in the same way as by nature. Each step then in the series is for the sake of the next; and generally art partly completes what nature cannot bring to a finish, and partly imitates her. If, therefore, artificial products are for the sake of an end, so clearly also are natural products. The relation of the later to the earlier terms of the series is the same in both.

This is most obvious in the animals other than man: they make things neither by art nor after inquiry or deliberation. Wherefore people discuss whether it is by intelligence or by some other faculty that these creatures work,—spiders, ants, and the like. By gradual advance in this direction we come to see clearly that in plants too that is produced which is conducive to the end—leaves, e.g., grow to provide shade for the fruit. If then it is both by nature and for an end that the swallow makes its nest and the spider its web, and plants grow leaves for the sake of the fruit and send their roots down (not up) for the sake of nourishment, it is plain that this kind of cause is operative in things which come to be and are by nature. And since ‘nature’ means two things, the matter and the form, of which the latter is the end, and since all the rest is for the sake of the end, the form must be the cause in the sense of ‘that for the sake of which’.

Now mistakes come to pass even in the operations of art: the grammarian makes a mistake in writing and the doctor pours out the wrong dose. Hence clearly mistakes are possible in the operations of nature also. If then in art there are cases in which what is rightly produced serves a purpose, and if where mistakes occur there was a purpose in what was attempted, only it was not attained, so must it be also in natural products, and monstrosities will be failures in the purposive effort. Thus in the original combinations the ‘ox-progeny’ if they failed to reach a determinate end must have arisen through the corruption of some principle corresponding to what is now the seed.

Further, seed must have come into being first, and not straightway the animals: the words ‘whole-natured first...’ must have meant seed.

Again, in plants too we find the relation of means to end, though the degree of organization is less. Were there then in plants also ‘olive-headed vine-progeny’, like the ‘man-headed ox-progeny’, or

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11 Empedocles, Fr. 62. 4.
and for the sake of so-and-so. This end, however, cannot be realized unless the saw is made of iron. It is, therefore, necessary for it to be of iron, if we are to have a saw and perform the operation of sawing. What is necessary then, is necessary on a hypothesis; it is not a result necessarily determined by antecedents. Necessity is in the matter, while 'that for the sake of which' is in the definition.

Necessity in mathematics is in a way similar to necessity in things which come to be through the operation of nature. Since a straight line is what it is, it is necessary that the angles of a triangle should equal two right angles. But not conversely; though if the angles are not equal to two right angles, then the straight line is not what it is either. But in things which come to be for an end, the reverse is true. If the end is to exist or does exist, that also which precedes it will exist or does exist; otherwise just as there, if the conclusion is not true, the premiss will not be true, so here the end or 'that for the sake of which' will not exist. For this too is itself a starting-point, but of the reasoning, not of the action; while in mathematics the starting-point is the starting point of the reasoning only, as there is no action. If then there

is to be a house, such-and-such things must be made or be there already or exist, or generally the matter relative to the end, bricks and stones if it is a house. But the end is not due to these except as the matter, nor will it come to exist because of them. Yet if they do not exist at all, neither will the house, nor the saw—the former in the absence of stones, the latter in the absence of iron—just as in the other case the premises will not be true, if the angles of the triangle are not equal to two right angles.

The necessary in nature, then, is plainly what we call by the name of matter, and the changes in it. Both causes must be stated by the physicist, but especially the end; for that is the cause of the matter, not vice versa; and the end is 'that for the sake of which', and the beginning starts from the definition or essence; as in artificial products, since a house is of such-and-such a kind, certain things must necessarily come to be or be there already, or since health is this, these things must necessarily come to be or be there already. Similarly if man is this, then these; if these, then those. Perhaps the necessary is present also in the definition. For if one defines the operation of sawing as being a certain kind of dividing, then this cannot come about unless the saw has teeth of a certain kind; and these cannot be unless it is of iron. For in the definition too there are some parts that are, as it were, its matter.

Nature has been defined as a 'principle of motion and change'; and it is the subject of our inquiry. We must therefore see that we understand the meaning of 'motion'; for if it were unknown, the meaning of 'nature' too would be unknown.

When we have determined the nature of motion, our next task will be to attack in the same way the terms which are involved in it. Now motion is supposed to belong to the class of things which are continuous; and the infinite presents itself first in the continuous—that is how it comes about that 'infinite' is often used in definitions of the continuous ('what is infinitely divisible is continuous'). Besides these, place, void, and time are thought to be necessary conditions of motion.

Clearly, then, for these reasons and also because the attributes mentioned are common to, and coextensive with, all the objects of our science, we must first take each of them in hand and discuss it. For the investigation of special attributes comes after that of the common attributes.

To begin then, as we said, with motion.

We may start by distinguishing (1) what exists in a state of fulfillment only, (2) what exists as potential, (3) what exists as potential and also in fulfillment—one being a 'this', another 'so much', a third 'such', and similarly in each of the other modes of the predication of being.

Further, the word 'relative' is used with reference to (1) excess and defect, (2) agent and patient and generally what can move and what can be moved. For 'what can cause movement' is relative to 'what can be moved', and vice versa.

Again, there is no such thing as motion over and above the things. It is always with respect to substance or to quantity or to quality or to place that what changes changes. But it is impossible, as we assert, to find anything common to these which is neither 'this' nor quantum nor quale nor any of the other predicates. Hence neither will motion and change have reference to something over and above the things mentioned, for there is nothing over and above them.

Now each of these belongs to all its subjects in either of two ways: namely (1) substance—the one is positive form, the other privation; (2) in quality, white and black; (3) in quantity, complete and incomplete; (4) in respect of locomotion, upwards and downwards or light and heavy. Hence there are as many types of motion or change as there are meanings of the word 'is'.