Aristotle

1. On Philosophy (from the *Metaphysics* I.1–2)\(^1\)

**Book I, Chapter 1**

All men by nature desire to know. An indication of this is the delight we take in our senses; for even apart from their usefulness they are loved for themselves; and above all others the sense of sight. For not only with a view to action, but even when we are not going to do anything, we prefer seeing (one might say) to everything else. The reason is that this, most of all the senses, makes us know and brings to light many differences between things.

By nature animals are born with the faculty of sensation, and from sensation memory is produced in some of them, though not in others. And therefore the former are more intelligent and apt at learning than those which cannot remember; those which are incapable of hearing sounds are intelligent though they cannot be taught, e.g. the bee, and any other race of animals that may be like it; and those which besides memory have this sense of hearing can be taught.

The animals other than man live by appearances and memories, and have but little of connected experience; but the human race lives also by art and reasonings. Now from memory experience is produced in men; for the several memories of the same thing produce finally the capacity for a single experience. And experience seems pretty much like science and art, but really science and art come to men through experience; for ‘experience made art’, as Polus says, ‘but inexperience luck.’ Now art arises when from many notions gained by experience one universal judgement about a class of objects is produced. For to have a judgement that when Callias was ill of this disease this did him good, and similarly in the case of Socrates and in many individual cases, is a matter of experience; but to judge that it has done good to all persons of a certain constitution, marked off in one class, when they were ill of this disease, e.g. to phlegmatic or bilious people when burning with fevers—this is a matter of art.

With a view to action experience seems in no respect inferior to art, and men of experience succeed even better than those who have theory without

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\(^1\) Translated by W. D. Ross.
experience. (The reason is that experience is knowledge of individuals, art of universals, and actions and productions are all concerned with the individual; for the physician does not cure man, except in an incidental way, but Callias or Socrates or some other called by some such individual name, who happens to be a man. If, then, a man has the theory without the experience, and recognizes the universal but does not know the individual included in this, he will often fail to cure; for it is the individual that is to be cured.) But yet we think that knowledge and understanding belong to art rather than to experience, and we suppose artists to be wiser than men of experience (which implies that Wisdom depends in all cases rather on knowledge); and this because the former know the cause, but the latter do not. For men of experience know that the thing is so, but do not know why, while the others know the ‘why’ and the cause. Hence we think also that the master workers in each craft are more honourable and know in a truer sense and are wiser than the manual workers, because they know the causes of the things that are done (we think the manual workers are like certain lifeless things which act indeed, but act without knowing what they do, as fire burns,—but while the lifeless things perform each of their functions by a natural tendency, the labourers perform them through habit); thus we view them as being wiser not in virtue of being able to act, but of having the theory for themselves and knowing the causes. And in general it is a sign of the man who knows and of the man who does not know, that the former can teach, and therefore we think art more truly knowledge than experience is; for artists can teach, and men of mere experience cannot.

Again, we do not regard any of the senses as Wisdom; yet surely these give the most authoritative knowledge of particulars. But they do not tell us the ‘why’ of anything—e.g. why fire is hot; they only say that it is hot.

At first he who invented any art whatever that went beyond the common perceptions of man was naturally admired by men, not only because there was something useful in the inventions, but because he was thought wise and superior to the rest. But as more arts were invented, and some were directed to the necessities of life, others to recreation, the inventors of the latter were naturally always regarded as wiser than the inventors of the former, because their branches of knowledge did not aim at utility. Hence when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life were discovered, and first in the places where men first began to have leisure. This is why the mathematical arts were founded in Egypt; for there the priestly caste was allowed to be at leisure.
We have said in the Ethics what the difference is between art and science and the other kindred faculties; but the point of our present discussion is this, that all men suppose what is called Wisdom to deal with the first causes and the principles of things; so that, as has been said before, the man of experience is thought to be wiser than the possessors of any sense-perception whatever, the artist wiser than the men of experience, the master worker than the mechanic, and the theoretical kinds of knowledge to be more of the nature of Wisdom than the productive. Clearly then Wisdom is knowledge about certain principles and causes.

Book I, Chapter 2

Since we are seeking this knowledge, we must inquire of what kind are the causes and the principles, the knowledge of which is Wisdom. If one were to take the notions we have about the wise man, this might perhaps make the answer more evident. We suppose first, then, that the wise man knows all things, as far as possible, although he has not knowledge of each of them in detail; secondly, that he who can learn things that are difficult, and not easy for man to know, is wise (sense-perception is common to all, and therefore easy and no mark of Wisdom); again, that he who is more exact and more capable of teaching the causes is wiser, in every branch of knowledge; and that of the sciences, also, that which is desirable on its own account and for the sake of knowing it is more of the nature of Wisdom than that which is desirable on account of its results, and the superior science is more of the nature of Wisdom than the ancillary; for the wise man must not be ordered but must order, and he must not obey another, but the less wise must obey him.

Such and so many are the notions, then, which we have about Wisdom and the wise. Now of these characteristics that of knowing all things must belong to him who has in the highest degree universal knowledge; for he knows in a sense all the instances that fall under the universal. And these things, the most universal, are on the whole the hardest for men to know; for they are farthest from the senses. And the most exact of the sciences are those which deal most with first principles; for those which involve fewer principles are more exact than those which involve additional principles, e.g. arithmetic than geometry. But the science which investigates causes is also instructive, in a higher degree, for the people who instruct us are those who tell the causes of each thing. And understanding and knowledge pursued for their own sake are found most in the knowledge of that which is most knowable (for he who chooses to know for the sake of knowing will choose most readily that which is most truly knowledge.
and such is the knowledge of that which is most knowable); and the first principles and the causes are most knowable; for by reason of these, and from these, all other things come to be known, and not these by means of the things subordinate to them. And the science which knows to what end each thing must be done is the most authoritative of the sciences, and more authoritative than any ancillary science; and this end is the good of that thing, and in general the supreme good in the whole of nature. Judged by all the tests we have mentioned, then, the name in question falls to the same science; this must be a science that investigates the first principles and causes; for the good, i.e. the end, is one of the causes.

That it is not a science of production is clear even from the history of the earliest philosophers. For it is owing to their wonder that men both now begin and at first began to philosophize; they wondered originally at the obvious difficulties, then advanced little by little and stated difficulties about the greater matters, e.g. about the phenomena of the moon and those of the sun and of the stars, and about the genesis of the universe. And a man who is puzzled and wonders thinks himself ignorant (whence even the lover of myth is in a sense a lover of Wisdom, for the myth is composed of wonders); therefore since they philosophized order to escape from ignorance, evidently they were pursuing science in order to know, and not for any utilitarian end. And this is confirmed by the facts; for it was when almost all the necessities of life and the things that make for comfort and recreation had been secured, that such knowledge began to be sought. Evidently then we do not seek it for the sake of any other advantage; but as the man is free, we say, who exists for his own sake and not for another’s, so we pursue this as the only free science, for it alone exists for its own sake.

Hence also the possession of it might be justly regarded as beyond human power; for in many ways human nature is in bondage, so that according to Simonides ‘God alone can have this privilege’, and it is unfitting that man should not be content to seek the knowledge that is suited to him. If, then, there is something in what the poets say, and jealousy is natural to the divine power, it would probably occur in this case above all, and all who excelled in this knowledge would be unfortunate. But the divine power cannot be jealous (nay, according to the proverb, ‘bards tell a lie’), nor should any other science be thought more honourable than one of this sort. For the most divine science is also most honourable; and this science alone must be, in two ways, most divine. For the science which it would be most meet for God to have is a divine science, and so is any science that deals with divine objects; and this science alone has both these qualities; for (1) God is thought to be
among the causes of all things and to be a first principle, and (2) such a science either God alone can have, or God above all others. All the sciences, indeed, are more necessary than this, but none is better.

Yet the acquisition of it must in a sense end in something which is the opposite of our original inquiries. For all men begin, as we said, by wondering that things are as they are, as they do about self-moving marionettes, or about the solstices or the incommensurability of the diagonal of a square with the side; for it seems wonderful to all who have not yet seen the reason, that there is a thing which cannot be measured even by the smallest unit. But we must end in the contrary and, according to the proverb, the better state, as is the case in these instances too when men learn the cause; for there is nothing which would surprise a geometer so much as if the diagonal turned out to be commensurable.

We have stated, then, what is the nature of the science we are searching for, and what is the mark which our search and our whole investigation must reach.
2. On the Principles of Change (from the *Physics* (I.1 and 7))

**Book I, Chapter 1**

When the objects of an inquiry, in any department, have principles, conditions, or elements, it is through acquaintance with these that knowledge, that is to say scientific knowledge, is attained. For we do not think that we know a thing until we are acquainted with its primary conditions or first principles, and have carried our analysis as far as its simplest elements. Plainly therefore in the science of Nature, as in other branches of study, our first task will be to try to determine what relates to its principles.

The natural way of doing this is to start from the things which are more knowable and obvious to us and proceed towards those which are clearer and more knowable by nature; for the same things are not ‘knowable relatively to us’ and ‘knowable’ without qualification. So in the present inquiry we must follow this method and advance from what is more obscure by nature, but clearer to us, towards what is more clear and more knowable by nature.

Now what is to us plain and obvious at first is rather confused masses, the elements and principles of which become known to us later by analysis. Thus we must advance from generalities to particulars; for it is a whole that is best known to sense-perception, and a generality is a kind of whole, comprehending many things within it, like parts. Much the same thing happens in the relation of the name to the formula. A name, e.g. ‘round’, means vaguely a sort of whole: its definition analyses this into its particular senses. Similarly a child begins by calling all men ‘father’, and all women ‘mother’, but later on distinguishes each of them.

**Book I, Chapter 7**

We will now give our own account, approaching the question first with reference to becoming in its widest sense: for we shall be following the natural order of inquiry if we speak first of common characteristics, and then investigate the characteristics of special cases.

We say that one thing comes to be from another thing, and one sort of thing from another sort of thing, both in the case of simple and of complex things. I mean the following. We can say (1) ‘man becomes musical’, (2) what is ‘not-
musical becomes musical’, or (3), the ‘not-musical man becomes a musical man’. Now what becomes in (1) and (2)—’man’ and ‘not musical’—I call simple, and what each becomes—’musical’—simple also. But when (3) we say the ‘not-musical man becomes a musical man’, both what becomes and what it becomes are complex.

As regards one of these simple ‘things that become’ we say not only ‘this becomes so-and-so’, but also ‘from being this, comes to be so-and-so’, as ‘from being not-musical comes to be musical’; as regards the other we do not say this in all cases, as we do not say (1) ‘from being a man he came to be musical’ but only ‘the man became musical’.

When a ‘simple’ thing is said to become something, in one case (1) it survives through the process, in the other (2) it does not. For man remains a man and is such even when he becomes musical, whereas what is not musical or is unmusical does not continue to exist, either simply or combined with the subject.

These distinctions drawn, one can gather from surveying the various cases of becoming in the way we are describing that, as we say, there must always be an underlying something, namely that which becomes, and that this, though always one numerically, in form at least is not one. (By that I mean that it can be described in different ways.) For ‘to be man’ is not the same as ‘to be unmusical’. One part survives, the other does not: what is not an opposite survives (for ‘man’ survives), but ‘not-musical’ or ‘unmusical’ does not survive, nor does the compound of the two, namely ‘unmusical man’.

We speak of ‘becoming that from this’ instead of ‘this becoming that’ more in the case of what does not survive the change—’becoming musical from unmusical’, not ‘from man’—but there are exceptions, as we sometimes use the latter form of expression even of what survives; we speak of ‘a statue coming to be from bronze’, not of the ‘bronze becoming a statue’. The change, however, from an opposite which does not survive is described indifferently in both ways, ‘becoming that from this’ or ‘this becoming that’. We say both that ‘the unmusical becomes musical’, and that ‘from unmusical he becomes musical’. And so both forms are used of the complex, ‘becoming a musical man from an unmusical man’, and unmusical man becoming a musical man’.
But there are different senses of ‘coming to be’. In some cases we do not use the expression ‘come to be’, but ‘come to be so-and-so’. Only substances\(^3\) are said to ‘come to be’ in the unqualified sense.

Now in all cases other than substance it is plain that there must be some subject, namely, that which becomes. For we know that when a thing comes to be of such a quantity or quality or in such a relation, time, or place, a subject is always presupposed, since substance alone is not predicated of another subject, but everything else of substance.

But that substances too, and anything else that can be said ‘to be’ without qualification, come to be from some substratum, will appear on examination. For we find in every case something that underlies from which proceeds that which comes to be; for instance, animals and plants from seed.

Generally things which come to be, come to be in different ways: (1) by change of shape, as a statue; (2) by addition, as things which grow; (3) by taking away, as the Hermes from the stone; (4) by putting together, as a house; (5) by alteration, as things which ‘turn’ in respect of their material substance.

It is plain that these are all cases of coming to be from a substratum.

Thus, clearly, from what has been said, whatever comes to be is always complex. There is, on the one hand, (a) something which comes into existence, and again (b) something which becomes that—the latter (b) in two senses, either the subject or the opposite. By the ‘opposite’ I mean the ‘unmusical’, by the ‘subject’ ‘man’, and similarly I call the absence of shape or form or order the ‘opposite’, and the bronze or stone or gold the ‘subject’.

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There is a sense, therefore, in which we must declare the principles to be two, and a sense in which they are three; a sense in which the contraries are the principles—say for example the musical and the unmusical, the hot and the cold, the tuned and the untuned—and a sense in which they are not, since it is impossible for the contraries to be acted on by each other. But this difficulty also is solved by the fact that the substratum is different from the contraries, for it is itself not a contrary. The principles therefore are, in a way, not more in number than the contraries, but as it were two, nor yet precisely two, since there

\(^3\) “Substance, in the truest and primary and most definite sense of the word, is that which is neither predicable of a subject [as the species of an individual] nor present in a subject [as the color of an individual thing]; for instance, the individual man or horse.”—Aristotle, *Categories* 5.
is a difference of essential nature, but three. For ‘to be man’ is different from ‘to be unmusical’, and ‘to be unformed’ from ‘to be bronze’.

We have now stated the number of the principles of natural objects which are subject to generation, and how the number is reached: and it is clear that there must be a substratum for the contraries, and that the contraries must be two. (Yet in another way of putting it this is not necessary, as one of the contraries will serve to effect the change by its successive absence and presence.)

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Whether the form or the substratum is the essential nature of a physical object is not yet clear. But that the principles are three, and in what sense, and the way in which each is a principle, is clear.

So much then for the question of the number and the nature of the principles.
3. On Nature (from the Physics (II.1 and 3))

Book II, Chapter 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 source 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 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’.

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4 Translated by R. P. Hardie and R. K. Gaye.
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 anything 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 until it receives the form specified in the definition, which we name in defining 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 combination 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 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.

**Book II, Chapter 3**

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 (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.

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.
Again (3) the primary source of the change or coming to rest; 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.

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 premisses 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.)