

ARISTOTLE ON THE NATURE, THE SOURCE, AND PRINCIPLE OF LIFE AND MOTION pdf

1: Aristotle: Motion and its Place in Nature | Internet Encyclopedia of Philosophy

Aristotle On The Nature, The Source, And Principle Of Life And Motion [F. W. Bussell] on www.enganchecubano.com
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First of all, the changes in nature are ordered, so that not just any substance can be immediately generated from any other substance. Rather, a substantial change is characteristically preceded by a series of accidental changes which prepare the way for the substantial change by rendering the substance which is the terminus a quo properly disposed for a substantial change. In other words, the elements entering into the constitution of a higher-level substance no longer exist as substances but have been "taken up" into the new substance and into the structures and processes which are peculiar to that new substance. In general, at whatever level of description we specify the material constituents of the new substance, those constituents, while contributing active and passive powers to the new substances, are not themselves substances. The substantial form dominates from the top all the way down, and from the bottom all the way up. This is most evident in the case of living things, but it is nearly as evident in the case of minerals composed of elements. The elements and minerals taken up into a living substance remain not in their substance but in their active and passive powers. More on this in a moment. Hence, even though primary matter never exists as such without any form, the unity of generated substances demands that the immediate subject of a substantial form be a matter capable of being totally "dominated by" the principle that makes a generated substance to be of a certain natural kind. This is primary matter. Every primary substance is a this-such, an undivided unity. Every terrestrial material primary substance is "composed of" primary matter and substantial form. A dynamic system of interacting substances endowed by their natures with active and passive causal powers and tendencies vs. What has a nature? Whatever exists by nature rather than by art. Every K, as a K, has a nature Answer C: Minerals, plants, and animals, as such, have natures That is, they have intrinsic principles of change that are peculiar to them as such and that go beyond the natures of their constituents taken by themselves or as mere aggregates. And this is just what it is to be a primary substance that belongs to a natural kind. This entails that "bottom-up" scientific analysis and study of non-elemental substances will invariably be incomplete though not without value ; instead, such study needs to be supplemented by "top-down" synthetic considerations. Reinventing Physics from the Bottom Down This shift is usually described in the popular press as the transition from the age of physics into the age of biology, but that is not quite right. What we are seeing is a transformation of world view in which the objective of understanding nature by breaking it down into ever smaller parts is supplanted by the objective of understanding how nature organizes itself. Nature as Matter and as Form Nature as matter: The specifying powers and tendencies of the proper species as such Directedness toward an ideal paradigm of the species As noted above, one reason why substantial form is said to inform primary matter directly is that all the primary constituents are subordinated to the substantial form and cease to exist as substances in their own right. They exist, as it were, only in their powers, which are subordinated to the new higher-level substance as a unified whole. The Four Causes Intrinsic causes and principles of explanation as applied to natural substances: Extrinsic causes and principles of explanation: Think of the normal growth and development of living organisms. That growth and development are effected intrinsically by parts of the substance itself [efficient cause], b ordered toward an end roughly, flourishing or the good for this sort of thing [final cause], where c this end is determined by the natural kind to which the substance belongs [formal cause, as in substantial form]. We will now explore the ordered nature of such change in a bit more detail. Blind Spontaneity Preliminary distinctions: Deterministic efficient cause vs. End-oriented efficient cause vs. Scenario the normal development of a red oak tree over time along a number of relevant parameters of the red oak "system": Nature, both as a whole and in the red-oak, is wholly indifferent as regards these two scenarios. Efficient causes if we can even talk of them on this view or "mechanisms" work without any "directedness" in both cases, at least without any directedness at the level of living things. So the red oak in Scenario 1 is not

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inherently a better or more perfect red oak than the one in Scenario 2. There are just atoms or elements or whatever churning away and "producing" effects in utter stupidity and blindness in both cases. Complete explanations of the two scenarios can in principle be given in terms of efficient causes or, better, blind mechanisms alone, without recourse to teleological notions like tendency, impediment, prevention, compensation, etc. Perhaps these complete explanations are too complicated for now or even in principle for human knowers to give, and so we sometimes have recourse to teleological notions to simplify things for ourselves. But these teleological notions have no ontological significance. The "deviant" or "abnormal" is explicable wholly by recourse to mechanisms and without recourse to the "normal" defined by some mysterious goals supposedly built into living bodies. To think otherwise is just dark-age superstition. Indeed, evaluative terms such as "deviant" or "abnormal" merely express our own preferences or interests rather than any fact about nature. Nature, both as a whole, and in the red oak, is not indifferent as regards the two scenarios. The red oak tree in Scenario 1 is a more perfect instance of red-oak-ness than the one in Scenario 2. The natures of living things have built into them a tendency toward a norm-of-flourishing for their species. In order to understand the two scenarios completely i. Once we understand a given nature scientifically, it is only deviant cases that require special explanation. What happens "always or for the most part" is indicative though not infallibly so of natural tendencies and propensities. What happens in nature happens because of the natural tendencies of the relevant agents. To think otherwise is to be the victim of new-age scientific superstition. Tendencies and Tomato Plants "Laws of Nature" What exactly are we saying when we say "It is a law of nature that salt dissolves in water"? Not that every instance of salt is dissolved in water, or even that every instance of salt would dissolve if placed in water. Salt by its nature has a defeasible or impedible tendency to dissolve in salt. The aim of science is thus to discover the natures of substances and hence their tendencies and characteristic ways of acting and being acted upon. Teleology in Plato and Aristotle Plato: The ultimate source of directedness in the physical world is extrinsic to the physical world. Shades of Divine Providence Aristotle: The ultimate source of directedness in the physical world is intrinsic to the physical world. Are these two positions, appearances to the contrary, compatible with one another? Form of a Living Substance Distinction between two senses of actuality: Or else the soul is being included in the bodily organism. Salient points neither dualism nor materialism: Each soul has its own proper proximate matter. Of all the souls of living things, only the rational soul is arguably subsistent i. Differences with Plato and Descartes: The soul is an intrinsic, rather than extrinsic, mover of the body. The soul is ontologically constitutive of, rather than posterior to, the bodily organism. Rather, the soul is the form or configuration of the matter in virtue of which this bodily substance is a tree, pig, aardvark, etc. Further difference with Descartes: Plants and animals are ensouled and are not reducible to machines, i.

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2: Aristotelian physics - Wikipedia

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Metaphysics substance, cause, form, potentiality Nicomachean Ethics soul, happiness, virtue, friendship Eudemian Ethics Politics best states, utopias, constitutions, revolutions Rhetoric elements of forensic and political debate Poetics tragedy, epic poetry 3. From their perspective, logic and reasoning was the chief preparatory instrument of scientific investigation. Aristotle himself, however, uses the term "logic" as equivalent to verbal reasoning. They seem to be arranged according to the order of the questions we would ask in gaining knowledge of an object. For example, we ask, first, what a thing is, then how great it is, next of what kind it is. Substance is always regarded as the most important of these. Substances are further divided into first and second: Notions when isolated do not in themselves express either truth or falsehood: The elements of such a proposition are the noun substantive and the verb. The combination of words gives rise to rational speech and thought, conveys a meaning both in its parts and as a whole. The truth or falsity of propositions is determined by their agreement or disagreement with the facts they represent. Thus propositions are either affirmative or negative, each of which again may be either universal or particular or undesignated. A definition, for Aristotle is a statement of the essential character of a subject, and involves both the genus and the difference. To get at a true definition we must find out those qualities within the genus which taken separately are wider than the subject to be defined, but taken together are precisely equal to it. For example, "prime," "odd," and "number" are each wider than "triplet" that is, a collection of any three items, such as three rocks ; but taken together they are just equal to it. The genus definition must be formed so that no species is left out. Having determined the genus and species, we must next find the points of similarity in the species separately and then consider the common characteristics of different species. Definitions may be imperfect by 1 being obscure, 2 by being too wide, or 3 by not stating the essential and fundamental attributes. Obscurity may arise from the use of equivocal expressions, of metaphorical phrases, or of eccentric words. All men are mortal; Socrates is a man; therefore, Socrates is mortal. The syllogistic form of logical argumentation dominated logic for 2, years until the rise of modern propositional and predicate logic thanks to Frege, Russell, and others. Aristotle begins by sketching the history of philosophy. For Aristotle, philosophy arose historically after basic necessities were secured. It grew out of a feeling of curiosity and wonder, to which religious myth gave only provisional satisfaction. The earliest speculators i. Thales, Anaximenes, Anaximander were philosophers of nature. The Pythagoreans succeeded these with mathematical abstractions. The level of pure thought was reached partly in the Eleatic philosophers such as Parmenides and Anaxagoras, but more completely in the work of Socrates. For Aristotle, the subject of metaphysics deals with the first principles of scientific knowledge and the ultimate conditions of all existence. More specifically, it deals with existence in its most fundamental state i. This can be contrasted with mathematics which deals with existence in terms of lines or angles, and not existence as it is in itself. In its universal character, metaphysics superficially resembles dialectics and sophistry. However, it differs from dialectics which is tentative, and it differs from sophistry which is a pretence of knowledge without the reality. The axioms of science fall under the consideration of the metaphysician insofar as they are properties of all existence. Aristotle argues that there are a handful of universal truths. Against the followers of Heraclitus and Protagoras, Aristotle defends both the laws of contradiction, and that of excluded middle. He does this by showing that their denial is suicidal. Carried out to its logical consequences, the denial of these laws would lead to the sameness of all facts and all assertions. It would also result in an indifference in conduct. Plato tried to solve the same question by positing a universal and invariable element of knowledge and existence -- the forms -- as the only real permanent besides the changing phenomena of the senses. Forms are not causes of movement and alteration in the physical objects of sensation. However, the forms place knowledge outside of particular things. Further, to suppose that we know particular things better by adding on their general conceptions of their forms, is about

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as absurd as to imagine that we can count numbers better by multiplying them. Finally, if forms were needed to explain our knowledge of particular objects, then forms must be used to explain our knowledge of objects of art; however, Platonists do not recognize such forms. However, that substance of a particular thing cannot be separated from the thing itself. Further, aside from the jargon of "participation," Plato does not explain the relation between forms and particular things. In reality, it is merely metaphorical to describe the forms as patterns of things; for, what is a genus to one object is a species to a higher class, the same idea will have to be both a form and a particular thing at the same time. In the *Metaphysics*, though, it frequently inclines towards realism that is, substance has a real existence in itself. We are also struck by the apparent contradiction in his claims that science deals with universal concepts, and substance is declared to be an individual. In any case, substance is for him a merging of matter into form. The term "matter" is used by Aristotle in four overlapping senses. First, it is the underlying structure of changes, particularly changes of growth and of decay. Secondly, it is the potential which has implicitly the capacity to develop into reality. Thirdly, it is a kind of stuff without specific qualities and so is indeterminate and contingent. Fourthly, it is identical with form when it takes on a form in its actualized and final phase. It was intended to solve the difficulties which earlier thinkers had raised with reference to the beginnings of existence and the relations of the one and many. There are four causes: Take, for example, a bronze statue. Its material cause is the bronze itself. Its efficient cause is the sculptor, insofar as he forces the bronze into shape. The formal cause is the idea of the completed statue. The final cause tends to be the same as the formal cause, and both of these can be subsumed by the efficient cause. Of the four, it is the formal and final which is the most important, and which most truly gives the explanation of an object. The final end purpose, or teleology of a thing is realized in the full perfection of the object itself, not in our conception of it. Final cause is thus internal to the nature of the object itself, and not something we subjectively impose on it. To Aristotle, God is the first of all substances, the necessary first source of movement who is himself unmoved. God is a being with everlasting life, and perfect blessedness, engaged in never-ending contemplation. Philosophy of Nature Aristotle sees the universe as a scale lying between the two extremes: The passage of matter into form must be shown in its various stages in the world of nature. It is important to keep in mind that the passage from form to matter within nature is a movement towards ends or purposes. Everything in nature has its end and function, and nothing is without its purpose. Everywhere we find evidences of design and rational plan. No doctrine of physics can ignore the fundamental notions of motion, space, and time. Motion is the passage of matter into form, and it is of four kinds: Of these the last is the most fundamental and important. Aristotle rejects the definition of space as the void. Empty space is an impossibility. Hence, too, he disagrees with the view of Plato and the Pythagoreans that the elements are composed of geometrical figures. Space is defined as the limit of the surrounding body towards what is surrounded. Time is defined as the measure of motion in regard to what is earlier and later. It thus depends for its existence upon motion. If there were no change in the universe, there would be no time. Since it is the measuring or counting of motion, it also depends for its existence on a counting mind. If there were no mind to count, there could be no time. After these preliminaries, Aristotle passes to the main subject of physics, the scale of being. The first thing to notice about this scale is that it is a scale of values. What is higher on the scale of being is of more worth, because the principle of form is more advanced in it. Species on this scale are eternally fixed in their place, and cannot evolve over time. The higher items on the scale are also more organized. Further, the lower items are inorganic and the higher are organic. The principle which gives internal organization to the higher or organic items on the scale of being is life, or what he calls the soul of the organism. Even the human soul is nothing but the organization of the body. Plants are the lowest forms of life on the scale, and their souls contain a nutritive element by which it preserves itself. Animals are above plants on the scale, and their souls contain an appetitive feature which allows them to have sensations, desires, and thus gives them the ability to move. The scale of being proceeds from animals to humans. The human soul shares the nutritive element with plants, and the appetitive element with animals, but also has a rational element which is distinctively our own. The details of the appetitive and rational aspects of the soul are

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described in the following two sections. For a fuller discussion of these topics, see the article Aristotle: Motion and its Place in Nature.

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3: Aristotle Quotes about Nature - Lib Quotes

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Aristotle conceived of God as outside of the world, as the final cause of all motion in Nature, as Prime Mover and Unmoved Mover of the universe. He was the crowning objective of all dynamic development in the cosmos from matter to form and from potentiality to actuality. He stood outside the Great Chain of Being yet was the source of all motion and development. Aristotle did not attribute mercy, love, sympathy and providence to God, but rather eternal self-contemplation. He is the source of motion and change in the universe, and He stands at the pinnacle of the Great Chain of Being by providing an example of pure form existing without any relation to matter. It can be summarized in the answer to two questions: And 2 What can we know about God? In answer to question 1 , Aristotle develops one argument, the argument from the existence of change or motion. His statement is very complex, but its main outlines can be indicated as follows: An infinite series of motions is impossible. Therefore, e there is an unmoved cause of motion, and this is God. This argument is not taken seriously today since most of its premises have been rejected by modern science. The claim that there exists an eternal circular motion is incompatible with the Second Law of thermodynamics. And if this is false then we do not have to accept premise c and its disjunction between an infinite series and an unmoved mover. Aristotle gives no satisfactory proof of d that an infinite series is impossible. Nonetheless, this argument has had a long history. Since God is an unmoved mover, he must be changeless. He cannot therefore be composed like other substances of actuality and potentiality. He must accordingly be all form, all actuality, and so completely immaterial. He moves the outermost sphere of the fixed stars and this motion is transmitted to the inner spheres by ordinary mechanical processes. But God himself does not move the outer heaven mechanically. Indeed, He could not do so, since He is immaterial and not in space. Instead, He moves it in a non-physical wayâ€”by being an object of attraction or desire. God is thus efficient cause by being a final cause. His own activity, being that of a purely immaterial being, must be an activity of thought that has itself as an object. Any lesser object would be a degradation of His divinity, and a changeable object of thought would entail a change in the thinker. God is absolute self-consciousness. In determining the content of divine thought, Aristotle uses a form of argumentation known in metaphysics as the doctrine of metaphysical perfection. The perfect being can only think perfect thoughts. To think anything less than perfect would be imperfect, and a contradiction. Therefore, the only content of thought that would be worthy of being thought by a perfect divinity would be itself. Therefore God contemplates himself. This suggests that god would not be contemplating the world. Aquinas argues that God in contemplating himself has indirect knowledge of the world. The idea of a God remote from the world, in no sense its creator, and indeed knowing nothing about it, may well seem repugnant to those brought up with Christian beliefs about god. If his God is remote from the world, Aristotle believes nevertheless that that the whole of nature seeks and desires the good: It is interesting to follow the reasoning that led him to affirm the existence of the immaterial and perfect being that he called God. It was the need to explain that which led Aristotle to develop his theory of the motion of the heavenly bodies and his concept of the Prime Mover as the final cause of their movements. Aristotle did not think it necessary to explain the existence of the universe. Being eternal, it never came into existence, and so, in his view, it did not need an efficient cause that brought it into beingâ€”a cause that operated like a human maker who produces a work of art. We normally speak of the human being who makes something as creative. However, the human creator always has the materials of nature to work on. He does not make something out of nothing. He is, therefore, not creative in the way that God is thought to be creative. It is difficult to determine whether the conception of God as creator would have arisen in the minds of later thinkers in the West had it not been for the opening sentence of Genesis, which reads: It would be both natural and reasonable to ask whether Aristotle would have accepted or rejected what is asserted by that

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sentence. Since he thought the universe to be eternal, would he not have denied that the universe had a beginning? And denying that, would he not also have rejected the notion of a God who created it. If to create is to cause something that does not exist to come into existence, comparable to what the human artist does in producing a work of art, then a world that has no beginning does not need a creator. But even a world that has no beginning may need a cause for its continued existence if its existence is not necessary. If the world does not exist necessarily, it may cease to exist. What then causes a world that may cease to exist everlastingly in existence? Aristotle had reasoned his way to the conclusion that a cause was needed to keep the universe everlastingly in motion. By parity of reasoning a cause would be needed to keep the universe everlastingly in existence, a sustaining cause, a cause in esse as the medievals put it. In another sense of the word, perhaps a more subtle sense, to create is to cause the existence of that which may or may not exist, without regard to its coming into existence. It is in the latter more subtle sense that Aristotle might have conceived God as both Prime mover and Creator. Aquinas reasons that God is self-subsisting existence, ipse esse subsistens. From this he deduces other properties which must belong to God. Aquinas notes that ipse esse subsistens, and actus purus and prime mover are metaphysical names of God and are applicable to one and the same substance. Thomas proves the infinitude and perfection of God from the notion of self-subsistence. That God is not body is his immateriality. His immateriality can be said to be a consequence of his being pure act, i. Now from these metaphysical properties of God God as infinite, immaterial, pure act, etc. For instance, the Christian God is there supposed to be alive, omniscient, and loving. And now the presence in God of perfect knowledge is proved from his immateriality. The order in which certain other properties are proved is in itself highly interesting. That God is living is proved from his intelligence, truly in the spirit of Aristotle. Furthermore, the presence in God of perfect knowledge is used to show that God is also the cause of things. It is manifest, Thomas says, that God causes things to be by his intellect. For his being, esse, is to understand, intelligere; therefore it is necessary that his knowledge is the cause of things. He adds, though, according as he has a will which joins in. I will comment on this additional clause in a moment. The idea behind this argument is this: Anybody who wants to make or produce something must have an idea or a previous knowledge of what he wants to produce. As Thomas puts it: This might make one think that the intellectualist view of God as prime cause is tempered by an element of voluntarism. But a closer reading shows that this is not so. For the presence of will follows upon the presence of intellect. Therefore there is will in any being that has intellect. Thomas asks whether there is love amor in God, and he answers: It has been shown that there is will in God, therefore is necessary to suppose that there is love also. Is the God of Aristotle a personal God? Aristotle sometimes speaks of the prime mover as o theos. Aristotle may not have spoken of the Prime Mover as being personal, and certainly the ascription of anthropomorphic personality would be very far indeed from his thoughts, but since the Prime Mover is Intelligence or Thought, it follows that he is personal in the philosophic sense. The Aristotelian God may not be personal secundum nomen, but he is personal secundum rem. It should be noted here that there is no indication that Aristotle ever thought of the Prime Mover as an object of worship, still less as a Being to whom prayers may be profitably addressed. It requires the further deductions of St. Thomas Aquinas to give us the God of providence and of love.

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4: Aristotle's Physics Book II

Aristotle: Motion and its Place in Nature. Aristotle's account of motion can be found in the Physics. By motion, Aristotle (B.C.E.) understands any kind of change. He defines motion as the actuality of a potentiality. Initially, Aristotle's definition seems to involve a contradiction.

References and Further Reading 1. The definition is a conjunction of two terms which normally contradict each other, along with, in Greek, a qualifying clause which seems to make the contradiction inescapable. Thomas Aquinas called it the only possible way to define motion by what is prior to and better known than motion. According to Descartes, "motion. The use of the word "passes" makes this definition an obvious circle; Descartes might just as well have called motion the action by which a thing moves. There must be ultimate terms of discourse, or there would be no definitions, and indeed no thought. The point is not that one cannot construct a non-circular definition of such a term, one claimed to be properly irreducible, but that one ought not to do so. The true atoms of discourse are those things which can be explained only by means of things less known than themselves. If motion is such an ultimate term, then to define it by means of anything but synonyms is willfully to choose to dwell in a realm of darkness, at the sacrifice of the understanding which is naturally ours in the form of "good sense" or ordinary common sense. The Cartesian physics is rooted in a disagreement with Aristotle about what the best-known things are, and about where thought should take its beginnings. An unusually clear instance of this attitude is found in the following sentence from a medieval Arabic commentary: Motion is an entelechy; motion is a transition. The strangeness of the word "entelechy" masks the contradiction between these two claims. It is at the heart not only of his definition of motion, but of all his thought. Its meaning is the most knowable in itself of all possible objects of the intellect. There is no starting point from which we can descend to put together the cements of its meaning. The problem with this alternative is that the word "actuality" already belongs to the English language, and has a life of its own which seems to be at variance with the simple sense of being active. By the actuality of a thing, we mean not its being-in-action but its being what it is. For example, there is a fish with an effective means of camouflage: But according to Aristotle, to be something always means to be at work in a certain way. In the case of the fish at rest, its actuality is the activity of metabolism, the work by which it is constantly transforming material from its environment into parts of itself and losing material from itself into its environment, the activity by which the fish maintains itself as a fish and as just the fish it is, and which ceases only when the fish ceases to be. Any static state which has any determinate character can only exist as the outcome of a continuous expenditure of effort, maintaining the state as it is. Thus even the rock, at rest next to the fish, is in activity: A rock at rest at the center is at work maintaining its place, against the counter-tendency of all the earth to displace it. The center of the universe is determined only by the common innate activity of rocks and other kinds of earth. Nothing is which is not somehow in action, maintaining itself either as the whole it is, or as a part of some whole. A rock is inorganic only when regarded in isolation from the universe as a whole which is an organized whole just as blood considered by itself could not be called alive yet is only blood insofar as it contributes to the maintenance of some organized body. No existing rock can fail to contribute to the hierarchical organization of the universe; we can therefore call any existing rock an actual rock. Energeia, then, always means the being-at-work of some definite, specific something; the rock cannot undergo metabolism, and once the fish does no more than fall to earth and remain there it is no longer a fish. The material and organization of a thing determine a specific capacity or potentiality for activity with respect to which the corresponding activity has the character of an end telos. Endecheia means continuity or persistence. In this striking instance, Aristotle seems to have imitated the playful style of his teacher in constructing the most important term in his technical vocabulary. Entelecheia means continuing in a state of completeness, or being at an end which is of such a nature that it is only possible to be there by means of the continual expenditure of the effort required to stay there. The word actuality as thus used is very close in

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meaning to the word life, with the exception that it is broader in meaning, carrying no necessary implication of mortality. The answer is now obviously "no. A dog is not a puppy: We might have trouble deciding exactly when the puppy has ceased to be a puppy and become a dog at the age of one year, for example, it will probably be fully grown and capable of reproducing, but still awkward in its movements and puppyish in its attitudes, but in any respect in which it has become a dog it has ceased to be a puppy. But our concern was to understand what motion is, and it is obviously the puppy which is in motion, since it is growing toward maturity, while the dog is not in motion in that respect, since its activity has ceased to produce change and become wholly directed toward self-maintenance. It seems that Descartes is right and Aristotle is wrong. Now, this suggestion would be laughable if it were not what almost everyone who addresses the question today believes. It is not translation or interpretation but plastic surgery. In each case the circular definition is chosen in preference to the one which seems laden with contradictions. A circular statement, to the extent that it is circular, is at least not false, and can as a whole have some content: There has been one major commentator on Aristotle who was prepared to take seriously and to make sense of both these claims. Writing a century after Maimonides and Averroes, Thomas disposes of their approach to defining motion with few words: A passage, a transition, an actualization, an actualizing, or any of the more complex substantives to which translators have resorted which incorporate in some more or less disguised form some progressive sense united to the meaning of actuality, all have in common that they denote a kind of motion. Motion is the mode in which the future belongs to the present, is the present absence of just those particular absent things which are about to be. Thomas discusses in detail the example of the water being heated. Assume it to have started cold, and to have been heated so far to room temperature. The heat it now has, which has replaced the potentiality it previously had to be just that hot, belongs to it in actuality. The capacity it has to be still hotter belongs to it in potentiality. To the extent that it is actually hot it has been moved; to the extent that it is not yet as hot as it is going to be, it is not yet moved. Since Descartes regards motion as ultimate and given, his physics will give no account of motion itself, but describe the transient static configurations through which the moving things pass. One could build on such an account a physics of forces, that is, of those directed potentialities which cause a thing to move, to pass over from the actuality it possesses to another which it lacks but to which it is ordered. Motion will thus not have to be understood as the mysterious departure of things from rest, which alone can be described, but as the outcome of the action upon one another of divergent and conflicting innate tendencies of things. Rest will be the anomaly, since things will be understood as so constituted by nature as to pass over of themselves into certain states of activity, but states of rest will be explainable as dynamic states of balance among things with opposed tendencies. According to Thomas, actuality and potentiality do not exclude one another but co-exist as motion. To the extent that an actuality is also a potentiality it is a motion, and to the extent that an actuality is a motion it is a potentiality. The two seeming contradictions cancel each other in the dynamic actuality of the present state which is determined by its own future. But are not potential and kinetic energy two different things? How can the description which is common to both, when one is moving and the other is at rest, be an account of what motion is? It seems that everything which Thomas says about the tepid water which is being heated can be said also of the tepid water which has been removed from the fire. Each is a coincidence of a certain actuality of heat with a further potentiality to the same heat. What does it mean to say that the water on the fire has, right now, an order to further heat which the water off the fire lacks? If we say that the fire is acting on the one and not on the other in such a way as to disturb its present state, we have begged the question and returned to the position of presupposing motion to explain motion. Maimonides, Averroes, and Ross fail to say how motion differs from rest. Thomas fails to say how any given motion differs from a corresponding state of balanced tension, or of strain and constraint. It is the actuality which has not canceled its corresponding potentiality but exists along with it. Motion then is the actuality of any potentiality insofar as it is still a potentiality. This is the formula which applies equally well to the dynamic state of rest and the dynamic state of motion. If the clause is understood adverbially, then, the sentence must mean something like: Whatever that might mean, it could at any rate not be a definition of motion. Thus the clause

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must be understood adjectivally, and Thomas must make the relative pronoun dependent upon a word with which it does not agree in gender. He makes the sentence say that motion is the actuality of the potentiality in which there is yet potentiality. Thomas resolved the contradiction by arguing that in every motion actuality and potentiality are mixed or blended, that the condition of becoming-hot of the water is just the simultaneous presence in the same water of some actuality of heat and some remaining potentiality of heat. The Thomistic blend of actuality and potentiality has the characteristic that, to the extent that it is actual it is not potential and to the extent that it is potential it is not actual; the hotter the water is, the less is it potentially hot, and the cooler it is, the less is it actually, the more potentially, hot. Maimonides, Averroes, and Ross, who say that motion is always a transition or passage from potentiality to actuality, must call the being-on-the-floor of the pencil, the being-yellow of the pages, and the crumbled condition of the binding of the book actualities. Thomas, who says that motion is constituted at any moment by the joint presence of actuality and potentiality, is in a still worse position: The actuality of the adult horse is one, although horses are many and all different from each other. Books and pencils are not actualities at all, even though they are organized wholes, since their organizations are products of human art, and they maintain themselves not as books and pencils but only as earth. By this strict test, the only actualities in the world, that is, the only things which, by their own innate tendencies, maintain themselves in being as organized wholes, seem to be the animals and plants, the ever-the-same orbits of the ever-moving planets, and the universe as a whole. The man with sight, but with his eyes closed, differs from the blind man, although neither is seeing. The first man has the capacity to see, which the second man lacks. There are then potentialities as well as actualities in the world. But when the first man opens his eyes, has he lost the capacity to see? Obviously not; while he is seeing, his capacity to see is no longer merely a potentiality, but is a potentiality which has been put to work. The potentiality to see exists sometimes as active or at-work, and sometimes as inactive or latent. But this example seems to get us no closer to understanding motion, since seeing is just one of those activities which is not a motion. When he is sitting or standing or lying still, his capacity to walk is latent, like the sight of the man with his eyes closed; that capacity nevertheless has real being, distinguishing the man in question from a man who is crippled to the extent of having lost all potentiality to walk. When the man is walking across the room, his capacity to walk has been put to work. It too is a potentiality which has been put to work by the act of walking. The actuality of the potentiality to be on the other side of the room, as just that potentiality, is neither more nor less than the walking across the room. A similar analysis will apply to any motion whatever. The growth of the puppy is not the actualization of its potentiality to be a dog, but the actuality of that potentiality as a potentiality. The falling of the pencil is the actuality of its potentiality to be on the floor, in actuality as just that: My walking across the room is no more a motion as the last step is being taken than at any earlier point. Every motion is a complex whole, an enduring unity which organizes distinct parts, such as the various positions through which the falling pencil passes. As parts of the motion of the pencil, these positions, though distinct, function identically in the ordered continuity determined by the potentiality of the pencil to be on the floor. Things have being to the extent that they are or are part of determinate wholes, so that to be means to be something, and change has being because it always is or is part of some determinate potentiality, at work and manifest in the world as change.

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5: Aristotle - The unmoved mover | www.enganchecubano.com

1. *Natures.* Nature, according to Aristotle, is an inner principle of change and being at rest (*Physics*, b). This means that when an entity moves or is at rest according to its nature reference to its nature may serve as an explanation of the event.

Spanning eight books, *Physics*, has little to do with what we know as "physics" and is more properly characterized as natural science. The first book modifies the traditional understanding of first principles. Most natural philosophers had assumed that first principles would be contraries—rare and dense, solid and void. But to this Aristotle would add a third principle, called the substratum. Two opposites cannot act upon each other; rather, they presuppose a substance. The substratum furnishes the substance to be acted on by the contraries. Thus, when a given substratum undergoes a change, there are actually three components involved. Matter consists of the substratum itself, form consists of the change undergone, and a third element called privation is presupposed by this change. That is, when the process was begun, the substratum consisted of two contrary elements, of which one would persist as the form and the other, the privation, would be replaced by its opposite. He begins by attempting a definition of nature: The second chapter turns to physics again, meaning natural philosophy and mathematics, which Platonists had previously distinguished as studies of different objects. Aristotle argued that the two subjects studied the same objects in different ways. In other words, the objects studied in physics consist of the very properties—planes and solids, for example—with which mathematics deals. Thus mathematics abstracts from the limits of physical bodies so that the properties are investigated without regard to motion. In this task he is searching for the kinds of causes that a natural philosopher must study: Aristotle goes on to distinguish between accidental and essential factors. A sculptor is an essential cause of a statue, but "a white male" would be true only incidentally. Books 3 through 7 deal generally with motion and the process of change. By the eighth book he is prepared to make some loftier conclusions. He postulates the existence of a prime mover that accounts for all movement in the world. Moreover, he argues that the prime mover is itself unmoved, just as a builder need not be built. He goes on to argue that the mover must be eternal, since it produces eternal motion. On the Heavens deals with questions of the universe. The outer sphere contained the fixed stars, and between this region and the earth was the sphere that contained the planets. As he attempts to find first principles, he argues that circular motion is primary, since it is complete in that it does not need a reversal to return to its starting point. And since circular motion is not natural for any of the four simple bodies earth, air, fire, and water, Aristotle postulates the existence of a fifth element. This body he calls the aether, and it is what the heavens are formed from. The remainder of the work continues to deal with motion as well as other properties, such as weight and lightness, which are nevertheless expressions of motion. On the whole, he attempts to prove through generally convoluted arguments that the universe is eternal—it had neither a beginning and will have no end—but is spatially finite. On Coming-to-be and Passing-away deals primarily with the four elements. He characterizes them as changeable and prefers the term "simple bodies," as they possess various distinctive qualities in different combinations. Meteorology discusses not only what the title suggests to our modern-day sensibilities, but also subjects such as astronomy, geography, and geology. The work is the least useful of the four discussed here, as it deals with theories that have long since been disproved and discarded.

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6: Nature (philosophy) - Wikipedia

The four causes (Physics II 3, b24) In one way, then, that out of which a thing comes to be and which persists, is called a cause, e.g. the bronze of the statue, the silver of the bowl.

The titles in this list are those in most common use today in English-language scholarship, followed by standard abbreviations in parentheses. For no discernible reason, Latin titles are customarily employed in some cases, English in others. Where Latin titles are in general use, English equivalents are given in square brackets. Whereas Descartes seeks to place philosophy and science on firm foundations by subjecting all knowledge claims to a searing methodological doubt, Aristotle begins with the conviction that our perceptual and cognitive faculties are basically dependable, that they for the most part put us into direct contact with the features and divisions of our world, and that we need not dally with sceptical postures before engaging in substantive philosophy. Accordingly, he proceeds in all areas of inquiry in the manner of a modern-day natural scientist, who takes it for granted that progress follows the assiduous application of a well-trained mind and so, when presented with a problem, simply goes to work. When he goes to work, Aristotle begins by considering how the world appears, reflecting on the puzzles those appearances throw up, and reviewing what has been said about those puzzles to date. These methods comprise his twin appeals to phenomena and the endoxic method. Human beings philosophize, according to Aristotle, because they find aspects of their experience puzzling. According to Aristotle, it behooves us to begin philosophizing by laying out the phenomena, the appearances, or, more fully, the things appearing to be the case, and then also collecting the endoxa, the credible opinions handed down regarding matters we find puzzling. As a typical example, in a passage of his *Nicomachean Ethics*, Aristotle confronts a puzzle of human conduct, the fact that we are apparently sometimes akratic or weak-willed. When introducing this puzzle, Aristotle pauses to reflect upon a precept governing his approach to philosophy: As in other cases, we must set out the appearances phenomena and run through all the puzzles regarding them. In this way we must prove the credible opinions endoxa about these sorts of experiences—ideally, all the credible opinions, but if not all, then most of them, those which are the most important. For if the objections are answered and the credible opinions remain, we shall have an adequate proof. EN b2a7 Scholars dispute concerning the degree to which Aristotle regards himself as beholden to the credible opinions endoxa he recounts and the basic appearances phenomena to which he appeals. So, as a group they must be re-interpreted and systematized, and, where that does not suffice, some must be rejected outright. It is in any case abundantly clear that Aristotle is willing to abandon some or all of the endoxa and phenomena whenever science or philosophy demands that he do so. Still, his attitude towards phenomena does betray a preference to conserve as many appearances as is practicable in a given domain—not because the appearances are unassailably accurate, but rather because, as he supposes, appearances tend to track the truth. We are outfitted with sense organs and powers of mind so structured as to put us into contact with the world and thus to provide us with data regarding its basic constituents and divisions. While our faculties are not infallible, neither are they systematically deceptive or misdirecting. Of course, it is not always clear what constitutes a phenomenon; still less is it clear which phenomenon is to be respected in the face of bona fide disagreement. This is in part why Aristotle endorses his second and related methodological precept, that we ought to begin philosophical discussions by collecting the most stable and entrenched opinions regarding the topic of inquiry handed down to us by our predecessors. Each of these translations captures at least part of what Aristotle intends with this word, but it is important to appreciate that it is a fairly technical term for him. An endoxon is the sort of opinion we spontaneously regard as reputable or worthy of respect, even if upon reflection we may come to question its veracity. Aristotle appropriates this term from ordinary Greek, in which an endoxos is a notable or honourable man, a man of high repute whom we would spontaneously respect—though we might, of course, upon closer inspection, find cause to criticize him. As he explains his use of the term, endoxa are widely shared opinions, often ultimately issuing from

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those we esteem most: Endoxa play a special role in Aristotelian philosophy in part because they form a significant sub-class of phenomena EN b3â€™8: He does think this, as far as it goes, but he also maintains, more instructively, that we can be led astray by the terms within which philosophical problems are bequeathed to us. Very often, the puzzles confronting us were given crisp formulations by earlier thinkers and we find them puzzling precisely for that reason. Equally often, however, if we reflect upon the terms within which the puzzles are cast, we find a way forward; when a formulation of a puzzle betrays an untenable structuring assumption, a solution naturally commends itself. This is why in more abstract domains of inquiry we are likely to find ourselves seeking guidance from our predecessors even as we call into question their ways of articulating the problems we are confronting. Aristotle applies his method of running through the phenomena and collecting the endoxa widely, in nearly every area of his philosophy. To take a typical illustration, we find the method clearly deployed in his discussion of time in Physics iv 10â€™ We begin with a phenomenon: So much is, inescapably, how our world appears: Yet when we move to offer an account of what time might be, we find ourselves flummoxed. For guidance, we turn to what has been said about time by those who have reflected upon its nature. It emerges directly that both philosophers and natural scientists have raised problems about time. As Aristotle sets them out, these problems take the form of puzzles, or aporiai, regarding whether and if so how time exists Phys. If we say that time is the totality of the past, present and future, we immediately find someone objecting that time exists but that the past and future do not. According to the objector, only the present exists. If we retort then that time is what did exist, what exists at present and what will exist, then we notice first that our account is insufficient: We further see that our account already threatens circularity, since to say that something did or will exist seems only to say that it existed at an earlier time or will come to exist at a later time. Then again we find someone objecting to our account that even the notion of the present is troubling. After all, either the present is constantly changing or it remains forever the same. If it remains forever the same, then the current present is the same as the present of 10, years ago; yet that is absurd. If it is constantly changing, then no two presents are the same, in which case a past present must have come into and out of existence before the present present. Either it went out of existence even as it came into existence, which seems odd to say the least, or it went out of existence at some instant after it came into existence, in which case, again, two presents must have existed at the same instant. In setting such aporiai, Aristotle does not mean to endorse any given endoxon on one side or the other. Rather, he thinks that such considerations present credible puzzles, reflection upon which may steer us towards a deeper understanding of the nature of time. In this way, aporiai bring into sharp relief the issues requiring attention if progress is to be made. Thus, by reflecting upon the aporiai regarding time, we are led immediately to think about duration and divisibility, about quanta and continua, and about a variety of categorial questions. That is, if time exists, then what sort of thing is it? Is it the sort of thing which exists absolutely and independently? Or is it rather the sort of thing which, like a surface, depends upon other things for its existence? When we begin to address these sorts of questions, we also begin to ascertain the sorts of assumptions at play in the endoxa coming down to us regarding the nature of time. Consequently, when we collect the endoxa and survey them critically, we learn something about our quarry, in this case about the nature of timeâ€™and crucially also something about the constellation of concepts which must be refined if we are to make genuine philosophical progress with respect to it. What holds in the case of time, contends Aristotle, holds generally. This is why he characteristically begins a philosophical inquiry by presenting the phenomena, collecting the endoxa, and running through the puzzles to which they give rise. Whereas science relies upon premises which are necessary and known to be so, a dialectical discussion can proceed by relying on endoxa, and so can claim only to be as secure as the endoxa upon which it relies. This is not a problem, suggests Aristotle, since we often reason fruitfully and well in circumstances where we cannot claim to have attained scientific understanding. Minimally, however, all reasoningâ€™whether scientific or dialecticalâ€™must respect the canons of logic and inference. Of course, philosophers before Aristotle reasoned well or reasoned poorly, and the competent among them had a secure working grasp of the principles of validity and soundness in argumentation. No-one before Aristotle, however,

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developed a systematic treatment of the principles governing correct inference; and no-one before him attempted to codify the formal and syntactic principles at play in such inference. Aristotle somewhat uncharacteristically draws attention to this fact at the end of a discussion of logic inference and fallacy: Once you have surveyed our work, if it seems to you that our system has developed adequately in comparison with other treatments arising from the tradition to date—bearing in mind how things were at the beginning of our inquiry—it falls to you, our students, to be indulgent with respect to any omissions in our system, and to feel a great debt of gratitude for the discoveries it contains. Generally, a deduction or syllogism, according to Aristotle, is a valid or acceptable argument. His view of deductions is, then, akin to a notion of validity, though there are some minor differences. For example, Aristotle maintains that irrelevant premises will ruin a deduction, whereas validity is indifferent to irrelevance or indeed to the addition of premises of any kind to an already valid argument. Moreover, Aristotle insists that deductions make progress, whereas every inference from p to p is trivially valid. In general, he contends that a deduction is the sort of argument whose structure guarantees its validity, irrespective of the truth or falsity of its premises. This holds intuitively for the following structure: All A s are B s. All B s are C s. Hence, all A s are C s. This particular deduction is perfect because its validity needs no proof, and perhaps because it admits of no proof either: Aristotle seeks to exploit the intuitive validity of perfect deductions in a surprisingly bold way, given the infancy of his subject: He contends that by using such transformations we can place all deduction on a firm footing. The perfect deduction already presented is an instance of universal affirmation: Now, contends Aristotle, it is possible to run through all combinations of simple premises and display their basic inferential structures and then to relate them back to this and similarly perfect deductions. It turns out that some of these arguments are deductions, or valid syllogisms, and some are not. Those which are not admit of counterexamples, whereas those which are, of course, do not. There are counterexamples to those, for instance, suffering from what came to be called undistributed middle terms, e . There is no counterexample to the perfect deduction in the form of a universal affirmation: So, if all the kinds of deductions possible can be reduced to the intuitively valid sorts, then the validity of all can be vouchsafed. To effect this sort of reduction, Aristotle relies upon a series of meta-theorems, some of which he proves and others of which he merely reports though it turns out that they do all indeed admit of proofs. His principles are meta-theorems in the sense that no argument can run afoul of them and still qualify as a genuine deduction. They include such theorems as: He does, in fact, offer proofs for the most significant of his meta-theorems, so that we can be assured that all deductions in his system are valid, even when their validity is difficult to grasp immediately. In developing and proving these meta-theorems of logic, Aristotle charts territory left unexplored before him and unimproved for many centuries after his death. Logic is a tool, he thinks, one making an important but incomplete contribution to science and dialectic. A deduction is minimally a valid syllogism, and certainly science must employ arguments passing this threshold. Still, science needs more: By this he means that they should reveal the genuine, mind-independent natures of things. That is, science explains what is less well known by what is better known and more fundamental, and what is explanatorily anemic by what is explanatorily fruitful. We may, for instance, wish to know why trees lose their leaves in the autumn. We may say, rightly, that this is due to the wind blowing through them. Still, this is not a deep or general explanation, since the wind blows equally at other times of year without the same result. A deeper explanation—one unavailable to Aristotle but illustrating his view nicely—is more general, and also more causal in character:

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7: Aristotle | Internet Encyclopedia of Philosophy

Aristotelian physics is a form of natural science described in the works of the Greek philosopher Aristotle (BCE). In his work Physics, Aristotle intended to establish general principles of change that govern all natural bodies, both living and inanimate, celestial and terrestrial - including all motion, change with respect to place, change with respect to size or number.

For example, a rock would fall unless stopped. Natural things stand in contrast to artifacts, which are formed by human artifice, not because of an innate tendency. The raw materials of a bed have no tendency to become a bed. In ancient Greek philosophy on the other hand, Nature or natures are ways that are "really universal" "in all times and places". To put this "discovery or invention" into the traditional terminology, what is "by nature" is contrasted to what is "by convention". The concept of nature taken this far remains a strong tradition in modern western thinking. In this account, there are four different types of cause: The material cause is the "raw material" - the matter which undergoes change. One of the causes of a statue being what it is might be that it is bronze. All meanings of the word nature encompass this simple meaning. The efficient cause is the motion of another thing, which makes a thing change, for example a chisel hitting a rock causes a chip to break off. This is the way which the matter is forming into a form so that it become substance like what Aristotle said that a substance must have a form and matter in order to call it substance. This is the motion of changing a single being into two. This is the most obvious way in which cause and effect works, as in the descriptions of modern science. But according to Aristotle, this does not yet explain that of which the motion is, and we must "apply ourselves to the question whether there is any other cause per se besides matter". Here, nature is a cause. The final cause is the aim towards which something is directed. For example, a human aims at something perceived to be good, as Aristotle says in the opening lines of the Nicomachean Ethics. In practice they imply a human-like consciousness involved in the causation of all things, even things which are not man-made. Nature itself is attributed with having aims. Technology was contrasted with science , as mentioned above. And another essential aspect to this understanding of causation was the distinction between the accidental properties of a thing and the substance - another distinction which has lost favor in the modern era, after having long been widely accepted in medieval Europe. To describe it another way, Aristotle treated organisms and other natural wholes as existing at a higher level than mere matter in motion. Aristotle then, described nature or natures as follows, in a way quite different from modern science All things are said to grow which gain increase through something else by contact and organic unity or adhesion, as in the case of embryos. Organic unity differs from contact; for in the latter case there need be nothing except contact, but in both the things which form an organic unity there is some one and the same thing which produces, instead of mere contact, a unity which is organic, continuous and quantitative but not qualitative. Again, "nature" means d the primary stuff, shapeless and unchangeable from its own potency, of which any natural object consists or from which it is produced; e. For each article consists of these "natures," the primary material persisting. It is in this sense that men call the elements of natural objects the "nature," some calling it fire, others earth or air or water, others something else similar, others some of these, and others all of them. Again in another sense "nature" means e the substance of natural objects; as in the case of those who say that the "nature" is the primary composition of a thing, or as Empedocles says: Of nothing that exists is there nature, but only mixture and separation of what has been mixed; nature is but a name given to these by men. Hence as regards those things which exist or are produced by nature, although that from which they naturally are produced or exist is already present, we say that they have not their nature yet unless they have their form and shape. That which comprises both of these exists by nature; e. And nature is both the primary matter and this in two senses: Indeed from this sense of "nature," by an extension of meaning, every essence in general is called "nature," because the nature of anything is a kind of essence. From what has been said, then, the primary and proper sense of "nature" is the essence of those things which contain in themselves as such a source of motion; for the

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matter is called "nature" because it is capable of receiving the nature, and the processes of generation and growth are called "nature" because they are motions derived from it. And nature in this sense is the source of motion in natural objects, which is somehow inherent in them, either potentially or actually. But in any case the theory of the four causes became a standard part of any advanced education in the Middle Ages. Modern science and laws of nature: He felt that lesser known Greek philosophers such as Democritus "who did not suppose a mind or reason in the frame of things", have been arrogantly dismissed because of Aristotelianism leading to a situation in his time wherein "the search of the physical causes hath been neglected, and passed in silence". Physic doth make inquiry, and take consideration of the same natures: Only as to the material and efficient causes of them, and not as to the forms. This part of metaphysique I do not find laboured and performed For example, in aphorism 51 he writes: The human understanding is, by its own nature, prone to abstraction, and supposes that which is fluctuating to be fixed. But it is better to dissect than abstract nature; such was the method employed by the school of Democritus, which made greater progress in penetrating nature than the rest. It is best to consider matter, its conformation, and the changes of that conformation, its own action, and the law of this action or motion, for forms are a mere fiction of the human mind, unless you will call the laws of action by that name. It means modern science limits its hypothesizing about non-physical things to the assumption that there are regularities to the ways of all things which do not change. These general laws, in other words, replace thinking about specific "laws", for example "human nature". In modern science, human nature is part of the same general scheme of cause and effect, obeying the same general laws, as all other things. The above-mentioned difference between accidental and substantial properties, and indeed knowledge and opinion, also disappear within this new approach that aimed to avoid metaphysics. As Bacon knew, the term "laws of nature" was one taken from medieval Aristotelianism. St Thomas of Aquinas for example, defined law so that nature really was legislated to consciously achieve aims, like human law: His most famous work, *Leviathan*, opens with the word "Nature" and then parenthetically defines it as "the art whereby God hath made and governes the world". Despite this pious description, he follows a Baconian approach. Following his contemporary, Descartes, Hobbes describes life itself as mechanical, caused in the same way as clockwork: For seeing life is but a motion of Limbs, the beginning whereof is in some principall part within; why may we not say, that all Automata Engines that move themselves by springs and wheelles as doth a watch have an artificiall life? On this basis, already being established in natural science in his lifetime, Hobbes sought to discuss politics and human life in terms of "laws of nature". But in the new modern approach of Bacon and Hobbes, and before them Machiavelli who however never clothed his criticism of the Aristotelian approach in medieval terms like "laws of nature", [14] such laws of nature are quite different to human laws: Having disconnected the term "law of nature" from the original medieval metaphor of human-made law, the term "law of nature" is now used less than in early modern times. To take the critical example of human nature, as discussed in ethics and politics, once early modern philosophers such as Hobbes had described human nature as whatever you could expect from a mechanism called a human, the point of speaking of human nature became problematic in some contexts. In the late 18th century, Rousseau took a critical step in his *Second Discourse*, reasoning that human nature as we know it, rational, and with language, and so on, is a result of historical accidents, and the specific up-bringing of an individual. The consequences of this line of reasoning were to be enormous. It was all about the question of nature. In effect it was being claimed that human nature, one of the most important types of nature in Aristotelian thinking, did not exist as it had been understood to exist. The survival of metaphysics[edit] The approach of modern science, like the approach of Aristotelianism, is apparently not universally accepted by all people who accept the concept of nature as a reality which we can pursue with reason. Bacon and other opponents of Metaphysics claim that all attempts to go beyond nature are bound to fall into the same errors, but Metaphysicians themselves see differences between different approaches. Immanuel Kant for example, expressed the need for a Metaphysics in quite similar terms to Aristotle. Bxxvi-xxvii As in Aristotelianism then, Kantianism claims that the human mind must itself have characteristics which are beyond nature, metaphysical, in some way. Specifically, Kant

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argued that the human mind comes ready-made with a priori programming, so to speak, which allows it to make sense of nature. The study of nature without metaphysics[edit] Authors from Nietzsche to Richard Rorty have claimed that science, the study of nature, can and should exist without metaphysics. But this claim has always been controversial.

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8: Aristotle's Natural Philosophy (Stanford Encyclopedia of Philosophy)

of Aristotle's life was devoted to the study of natural science including areas we would now call meteorology, chemistry, physics, psychology, and biology. Fully a third of Aristotle's work was in biology.

Bring fact-checked results to the top of your browser search. The unmoved mover The way in which Aristotle seeks to show that the universe is a single causal system is through an examination of the notion of movement, which finds its culmination in Book XI of the *Metaphysics*. As noted above, motion, for Aristotle, refers to change in any of several different categories. He then argues that there cannot be an infinite series of moved movers. If it is true that when A is in motion there must be some B that moves A, then if B is itself in motion there must be some C moving B, and so on. This series cannot go on forever, and so it must come to a halt in some X that is a cause of motion but does not move itself—“an unmoved mover. Since the motion it causes is everlasting, this X must itself be an eternal substance. It must lack matter, for it cannot come into existence or go out of existence by turning into anything else. It must also lack potentiality, for the mere power to cause motion would not ensure the sempiternity of motion. It must, therefore, be pure actuality *energeia*. Although the revolving heavens, for Aristotle, lack the possibility of substantial change, they possess potentiality, because each heavenly body has the power to move elsewhere in its diurnal round. Since these bodies are in motion, they need a mover, and this is a motionless mover. Such a mover could not act as an efficient cause, because that would involve a change in itself, but it can act as a final cause—“an object of love—“because being loved does not involve any change in the beloved. The stars and planets seek to imitate the perfection of the unmoved mover by moving about the Earth in a circle, the most perfect of shapes. For this to be the case, of course, the heavenly bodies must have souls capable of feeling love for the unmoved mover. The delight that a human being takes in the sublimest moments of philosophical contemplation is in God a perpetual state. What, Aristotle asks, does God think of? He must think of something—“otherwise, he is no better than a sleeping human—“and whatever he is thinking of, he must think of eternally. Either he thinks about himself, or he thinks about something else. But the value of a thought depends on the value of what it is a thought of, so, if God were thinking of anything other than himself, he would be somehow degraded. So he must be thinking of himself, the supreme being, and his life is a thinking of thinking *noesis noeseos*. This conclusion has been much debated. Some have regarded it as a sublime truth; others have thought it a piece of exquisite nonsense. Whatever the truth about the object of thought of the unmoved mover, it seems clear that it does not include the contingent affairs of individual human beings. And this is why *metaphysics* can be called by two such different names. When Aristotle says that first philosophy studies the whole of being, he is describing it by indicating the field it is to explain; when he says that it is the science of the divine, he is describing it by indicating its ultimate principles of explanation. Thus, first philosophy is both the science of being *qua* being and also theology. Philosophy of science In his *Posterior Analytics* Aristotle applies the theory of the syllogism to scientific and epistemological ends. Scientific knowledge, he urges, must be built up out of demonstrations. A demonstration is a particular kind of syllogism, one whose premises can be traced back to principles that are true, necessary, universal, and immediately intuited. These first, self-evident principles are related to the conclusions of science as axioms are related to theorems: The most important axioms, Aristotle thought, would be those that define the proper subject matter of a science thus, among the axioms of geometry would be the definition of a triangle. For this reason much of the second book of the *Posterior Analytics* is devoted to definition. Generations of scholars have tried in vain to find in his writings a single instance of a demonstrative syllogism. Moreover, the whole history of scientific endeavour contains no perfect instance of a demonstrative science.

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9: Aristotle's Concept of God "Heptapolis"

Nature herself, as has been often said, requires that we should be able, not only to work well, but to use leisure well; for, as I must repeat once again, the first principle of all action is leisure.

Contemporaries of Aristotle like Aristarchus rejected these principles in favor of heliocentrism, but their ideas were not widely accepted. Indeed, the *Physics* is largely concerned with an analysis of motion, particularly local motion, and the other concepts that Aristotle believes are requisite to that analysis. White, "Aristotle on the Infinite, Space, and Time" in *Blackwell Companion to Aristotle* There are clear differences between modern and Aristotelian physics, the main being the use of mathematics, largely absent in Aristotle. The terrestrial spheres of water and earth shown in the form of continents and oceans are at the center of the universe, immediately surrounded by the spheres of air, and then fire, where meteorites and comets were believed to originate. The surrounding celestial spheres from inner to outer are those of the Moon, Mercury, Venus, Sun, Mars, Jupiter, and Saturn, each indicated by a planet symbol. The eighth sphere is the firmament of fixed stars, which include the visible constellations. The precession of the equinoxes caused a gap between the visible and notional divisions of the zodiac, so medieval Christian astronomers created a ninth sphere, the Crystallinum which holds an unchanging version of the zodiac. Above that, Christian theology placed the "Empire of God". What this diagram does not show is how Aristotle explained the complicated curves that the planets make in the sky. To preserve the principle of perfect circular motion, he proposed that each planet was moved by several nested spheres, with the poles of each connected to the next outermost, but with axes of rotation offset from each other. Though Aristotle left the number of spheres open to empirical determination, he proposed adding to the many-sphere models of previous astronomers, resulting in a total of 44 or 55 celestial spheres. Elements and spheres[edit] Main article: Classical element Aristotle divided his universe into "terrestrial spheres" which were "corruptible" and where humans lived, and moving but otherwise unchanging celestial spheres. Aristotle believed that four classical elements make up everything in the terrestrial spheres: Other, lighter objects, he believed, have less earth, relative to the other three elements in their composition. During the Scientific Revolution, the ancient theory of classical elements was found to be incorrect, and was replaced by the empirically tested concept of chemical elements. Because the celestial spheres are incapable of any change except rotation, the terrestrial sphere of fire must account for the heat, starlight and occasional meteorites. The celestial spheres are composed of the special element aether, eternal and unchanging, the sole capability of which is a uniform circular motion at a given rate relative to the diurnal motion of the outermost sphere of fixed stars. The concentric, aetherial, cheek-by-jowl "crystal spheres" that carry the Sun, Moon and stars move eternally with unchanging circular motion. Spheres are embedded within spheres to account for the "wandering stars" i. Mercury, Venus, Mars, Jupiter, and Saturn are the only planets including minor planets which were visible before the invention of the telescope, which is why Neptune and Uranus are not included, nor are any asteroids. Aristotle submits to the calculations of astronomers regarding the total number of spheres and various accounts give a number in the neighborhood of fifty spheres. An unmoved mover is assumed for each sphere, including a "prime mover" for the sphere of fixed stars. Terrestrial change[edit] The four terrestrial elements Unlike the eternal and unchanging celestial aether, each of the four terrestrial elements are capable of changing into either of the two elements they share a property with: These properties are predicated of an actual substance relative to the work it is able to do; that of heating or chilling and of desiccating or moistening. The four elements exist only with regard to this capacity and relative to some potential work. Natural place[edit] The Aristotelian explanation of gravity is that all bodies move toward their natural place. For the elements earth and water, that place is the center of the geocentric universe; [11] the natural place of water is a concentric shell around the earth because earth is heavier; it sinks in water. The natural place of air is likewise a concentric shell surrounding that of water; bubbles rise in water. Finally, the natural place of fire is higher than that of air but below the innermost celestial sphere carrying the

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Moon. This definition remained dominant until the beginning of the 17th century, even though it had been questioned and debated by philosophers since antiquity. For example, earth, the heaviest element, and water, fall toward the center of the cosmos; hence the Earth and for the most part its oceans, will have already come to rest there. At the opposite extreme, the lightest elements, air and especially fire, rise up and away from the center. Instead, they are abstractions used to explain the varying natures and behaviors of actual materials in terms of ratios between them. Motion and change are closely related in Aristotelian physics. Motion, according to Aristotle, involved a change from potentiality to actuality. In *Physics* he states that objects fall at a speed proportional to their weight and inversely proportional to the density of the fluid they are immersed in. Now however it is understood that at any time prior to achieving terminal velocity in a relatively resistance-free medium like air, two such objects are expected to have nearly identical speeds because both are experiencing a force of gravity proportional to their masses and have thus been accelerating at nearly the same rate. This became especially apparent from the eighteenth century when partial vacuum experiments began to be made, but some two hundred years earlier Galileo had already demonstrated that objects of different weights reach the ground in similar times. It is obvious that there are principles and causes which are generable and destructible apart from the actual processes of generation and destruction; for if this is not true, everything will be of necessity: Will this be, or not? Yes, if this happens; otherwise not *Metaphysics VI, a Continuum and vacuum*[edit] Aristotle argues against the indivisibles of Democritus which differ considerably from the historical and the modern use of the term "atom". As a place without anything existing at or within it, Aristotle argued against the possibility of a vacuum or void. The void, therefore, could never form. Four causes and Teleology According to Aristotle, there are four ways to explain the *aitia* or causes of change. He writes that "we do not have knowledge of a thing until we have grasped its why, that is to say, its cause. For a table, that might be wood; for a statue, that might be bronze or marble. A little later on. Aristotle re-iterates this claim, in slightly different terms, in *An.* He says for example that the ratio 2: Form is not just shape We are asking and this is the connection with essence, particularly in its canonical Aristotelian formulation what it is to be some thing. And it is a feature of musical harmonics first noted and wondered at by the Pythagoreans that intervals of this type do indeed exhibit this ratio in some form in the instruments used to create them the length of pipes, of strings, etc. In some sense, the ratio explains what all the intervals have in common, why they turn out the same. For example, the efficient cause of a baby is a parent of the same species and that of a table is a carpenter, who knows the form of the table. In his *Physics II, b29â€”32*, Aristotle writes: For Aristotle, any process requires a constantly operative efficient cause as long as it continues. Similarly, in every case of animal generation, there is always some thing responsible for the continuity of that generation, although it may do so by way of some intervening instrument *Phys II*. Goals have an explanatory function: Less of a commonplace is the view espoused by Aristotle, that finality and purpose are to be found throughout nature, which is for him the realm of those things which contain within themselves principles of movement and rest i. Thus a man may exercise for the sake of his health: But the eyelids are for the sake of the eye to protect it:

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