

Nature

INTRODUCTION

NATURE is a term which draws its meaning from the other terms with which it is associated by implication or contrast. Yet it is not one of a fixed pair of terms, like necessity and contingency, one and many, universal and particular, war and peace. When things are divided into the natural and the artificial, or into the natural and the conventional, the opposite of the natural does not represent a loss or violation of nature, but rather a transformation of nature through the addition of a new factor. The unnatural, on the other hand, seems to be merely a deviation, a falling away from, or sometimes a transgression of nature.

Most of the terms which stand in opposition to nature represent the activity or being of man or God. As appears in the chapter on **MEDICINE**, Galen thinks of nature as an artist. Harvey later develops this notion. But with these two exceptions, the traditional theory of art conceives it not as the work of nature, but of man. Despite other differences in the great books on the theory of art, especially with regard to art's imitation of nature, there seems to be a common understanding that works of art are distinguished from productions of nature by the fact that man has added something to nature. A world which man left exactly as he found it would be a world without art or any trace of the artificial in it.

The ancient authors who contrast the natural and the conventional and the modern authors who distinguish man's life in a state of nature from his life in civil society seem to imply that without something done by man there would be nothing conventional or political. Locke appears to be an exception here. He thinks that there is a natural as well as

a civil, or political, society. Natural society is the society of "men living together according to reason without a common superior on earth, with authority to judge between them." Unlike Hobbes or Kant or Hegel, Locke does not think that the state of nature is necessarily a state of war. But this difference between Locke and others does not affect the point that the political institutions of civil society are things of man's own devising.

There may be, among the social insects, natural organizations such as the beehive and the ant mound. It may even be, as Locke supposes, that in a state of nature, "men living together according to reason" would constitute a society. But in neither case does the society we call "a state" result. States differ from one another in many features of their political organization. In this sense the state or political community is conventional rather than natural; its institutions are humanly contrived.

The social contract theory of the origin of the state is not necessarily involved in the recognition that the state is partly conventional. Aristotle, for example, who regards the state as natural—he speaks of it as "a creation of nature"—does not think of the political community as natural in the sense in which a beehive is natural. That men should form political communities is, in his view, the result of a natural desire, a tendency inherent in the nature of man as a political animal. But what form the political community will take is at least partly determined by the particular arrangements men voluntarily institute. Man-made laws are conventional, but so also are other institutions which vary from state to state or change from time to time.

THE ISSUES IN political theory raised by any consideration of what is and is not natural about society or the state are discussed in other chapters, *e.g.*, FAMILY and STATE. What is true in this connection is likely to be true of each of the other fundamental oppositions in which the notion of nature is involved. The issues raised by the relation of art to nature are, for example, considered in the chapter on ART; those raised by the distinction between nature and nurture are considered in the chapter on HABIT, and so on. Here we are concerned not with the theoretical consequences of different conceptions of nature, but with the various meanings of the term itself as it is used in different contexts.

Common to all meanings is the notion that the natural is that which man's doing or making has not altered or enlarged. The distinction between nature and nurture confirms this. Man's activities are the source of modifications in his own nature as well as in the nature of other things. The human nature man is born with undergoes transformations in the course of life: the acquirement of knowledge, the formation of habits (which are often called "second nature"), the modification of instincts. The sum of these changes represents what nurture adds to nature.

When changes of this sort are looked at collectively they give rise to the notions of culture or civilization—two more terms which present a contrast to nature. In Rousseau and others we meet the feeling that man may have lost, not gained, by exchanging the natural for the civilized life. The ideal of a return to nature involves more than a return to the soil, or an exodus from the city to the country. In its most radical form, this ideal calls upon man to divest himself of all the artifices and conceits with which he has thought to improve on nature—"by renouncing its advances," Rousseau says, "in order to renounce its vices."

But why, it may be asked, is the whole world which man creates not as natural as the materials which man finds to work with—the resources of physical nature and the native equipment which is man's nature at birth? If man himself is a natural entity, and if all human activities are somehow determined by

human nature, then why are not the works of art and science, the development of political institutions, the cultivation of human beings by education and experience, and all other features of civilization—why are not all these just as natural as the falling stone, the flourishing forest, or the beehive? Why, in short, should there be any contrast between the works of nature and the works of man?

THIS QUESTION points to one of the fundamental issues in the traditional discussion of nature. Those who uphold the validity of the contrast defend its significance in terms of something quite special about human nature. If man were entirely a creature of instinct—if everything man did were determined by his nature so that no choices were open to him and no deviation from the course of nature possible—then the human world would seem to fade into the rest of nature. Only on the supposition that man is by nature rational and free do those human works which are the products of reason or the consequences of free choice seem to stand in sharp contrast to all other natural existences or effects of natural causes.

Of these two factors—rationality and freedom—the element of freedom is usually the one most emphasized. The line is drawn between that which natural causes determine and that which man determines by his own free choice. The laws of nature are often conceived as expressing an inherent rationality in nature itself, but they also state the uniformity of nature's operations. Such maxims of nature as "nature does nothing in vain," "nature abhors a vacuum," or "nature does nothing by jumps" are usually interpreted as describing nature's invariable way of doing things. Aristotle's distinction between things which happen naturally and those which happen by chance turns on the regularity of the events which result from causes in the very nature of things. The natural is that which happens either always or for the most part.

Hence, even if there is rationality of some sort in the structure of nature, that supposition does not seem to affect the position of those who connect human reason with human freedom and who, in consequence, divide the

things which happen as a result of man's free choice from everything else which happens in the course of nature. This may be exemplified by the Greek understanding of the difference between nature and convention. The laws of Persia vary from the laws of Greece, the political institutions of the city-states vary from those of the Homeric age, customs and constitutions differ from city to city. Unlike such conventions, "that which is by nature," Aristotle writes, "is unchangeable and has everywhere the same force, as fire burns both here and in Persia." The conventional is the variable, the natural the uniform. The variability of conventions, moreover, seems to suggest that they are products of freedom or choice.

The difference between the beehive and the human city is that one is *entirely* a creation of nature, a social organization entirely determined by the instincts of the bees, so that wherever bees form a hive, it is formed in the same way; whereas the human city involves something more than a natural desire of men, since when these political animals associate in different places, they set up different forms of government and different kinds of law. The same comparison can be made between the spider's web or the beaver's dam and such products of human art as cloth and houses. The variability of the works of reason, as opposed to the uniformity of instinctive productions of all sorts, implies the factor of choice in reason's work.

THE CONCEPTION OF nature which tries to separate the natural from what man contributes thus seems to depend upon the conception of man. Controversies concerning man's difference from other animals, especially the dispute about human freedom (considered in such chapters as MAN and WILL), bear directly on the issue of the naturalness of the things which result from man's doing and making.

Spinoza, for example, in holding that human actions constitute no exception to the reign of necessity throughout nature, removes any ground for distinguishing the effects of human operation from other effects. Man exercises no freedom of choice; nor does man in any other way introduce a new principle into the

order or process of nature. Hobbes and Locke concur in the denial of free will, but they separate the inventions of man's mind or his social institutions from what happens without human contrivance in the realm of thought or action. The difference between simple and complex ideas for Locke seems to parallel the ancient distinction between nature and art.

At the other extreme from Spinoza, Kant separates the order of nature and the order of freedom into worlds as radically asunder as the Cartesian realms of matter and mind. The world of nature is the system or order of the objects of sense—"the sum total of phenomena insofar as they . . . are connected with each other throughout." For Kant this means two things which are strictly correlative. Nature is the object of the theoretical sciences and it is also the realm of time, space, and causality. Like Spinoza, Kant identifies the order of nature with the order of causal necessity. But, unlike Spinoza, Kant places the moral and political life of man in an order unconditioned by time, space, and causality. This realm of freedom is the sphere of the moral or practical sciences. The natural or theoretical sciences do not extend to what Kant calls the "supersensible" or the "noumenal" order—the world of things lying outside the range of sense-experience.

There is an alternative to Spinoza's location of all events within the order of nature and to Kant's separation of the realm of nature from the domain of freedom. It takes the form of Aristotle's or Aquinas' distinction between the natural and the voluntary. The voluntary is in one sense natural, in another not. It is natural in the sense that what happens voluntarily in the realm of animal and human motions proceeds from causes as natural as those responsible for the motions of inert bodies. A voluntary act, according to Aquinas, comes from "an intrinsic principle," just as the falling of a stone proceeds from "a principle of movement in the stone." But among the factors responsible for voluntary acts is "knowledge of the end"—knowledge of the object being sought. The sphere of the voluntary can therefore be equated with the sphere of conscious desire, *i.e.*, with desire aroused by an object

known, whether known by sense or reason. The natural in the sense in which it is distinguished from the voluntary is the sphere of motions in line with natural desire, *i.e.*, with tendencies founded in the very nature of a body or organism and unaccompanied by any awareness of the goal toward which it is thus inclined to move.

Aristotle's distinction between natural and violent motion (which Galileo and other physicists adopt) seems to throw light on a double use of the term 'natural' here. Galileo treats the motion of a freely falling body as natural, in contrast to the motion of a projectile. In the former case, it is the nature of heavy bodies to gravitate toward the earth; whereas in the latter case, in addition to the motion of gravitation, another motion is imparted to the body when it is shot from a gun—a motion which does not proceed from the body's own nature but is caused by the motions of other bodies. In terms of this distinction, voluntary motions are natural rather than violent. In fact, the violent is sometimes thought to be even more opposed to the voluntary than to the natural, in the sense that a man acting contrary to his will under external coercion suffers violence. When he does what he wishes, his conduct is not only voluntary but natural, *i.e.*, free from the violence of external forces.

It is necessary to consider the additional distinction between the voluntary and the free. Animals acting from desires caused by the perception of certain objects act voluntarily, but, in the theory of Aristotle and Aquinas, only men freely choose among alternative objects of desire or between means for accomplishing an end. The effects of voluntary action differ from other natural events only because knowledge enters into their determination. But that which happens as the result of man's free choice is determined neither by his nature nor by his knowledge. Hence whatever comes into existence through man's choice stands apart from all that is naturally determined to exist.

One other matter bears on this consideration of the natural in relation to the voluntary and the free. Spinoza excludes the operation of final causes, as well as free choice, from the order of nature. Purposes or ends are not

principles of nature. Aristotle, on the other hand, thinks that final causes are operative in every part of nature. He finds them in the sphere of inert bodies which naturally tend toward certain results. He finds them in the sphere of animal and human motions, where the final cause or end may be an object of conscious desire.

So far as the search for causes is concerned, nature presents the same kind of problems to the physicist as to the biologist or psychologist. In only one sense are final causes peculiarly present in human conduct; that is the sense in which the change effected is not the ultimate end, but only a means to some further end desired. Here there is an extrinsic final cause as well as a final cause intrinsic to the change itself. It may be with regard to this special sense that Francis Bacon says of final causes that they are "more allied to man's own nature than to the system of the universe." Yet Bacon, far from denying their presence in the scheme of things, assigns the investigation of final causes to metaphysics (as a branch of natural philosophy) rather than to physics. For him the ascertainment of final causes does not discover a purpose in the nature of things. Rather it looks to God's plan and providence.

WE HAVE SO FAR dealt with that consideration of nature which opposes the natural to the works of man. The discussion of nature also moves on a theological plane. Here, on one traditional view, the natural is not opposed to, but rather identified with the work of God. "Things which are said to be made by nature," Plato writes, "are the work of divine art." Those who conceive the universe as God's creation, and think of God alone as uncreated being, tend to use the word "nature" collectively for the whole world of creatures and distributively for each type of thing which has its being from God.

The distinction between the supernatural and the natural has many interpretations in Christian theology, but none more basic than that which divides all being into the uncreated and the created. On this view, the order of nature includes more than the world of physical, sensible things. It includes the spiritual cre-

ation—angels and souls—as well. Immaterial beings are no more supernatural than bodies. They, too, are created natures. Only God is uncreated being.

Those who do not have or who deny a doctrine of creation use the word “nature” in a *less* and in a *more* comprehensive sense. The Greek philosophers, for example, seem to restrict the natural to the physical, *i.e.*, to the realm of material, sensible, changing things. Change is an element in the connotation of the Greek word *phūsis*, of which *natura* is the Latin equivalent. As Greek scientists conceive the study of nature, it is the business of physics to investigate the principles, causes, and elements of change.

Things which are thought to be untouched by change, such as the objects of mathematics, self-subsistent ideas, or separate forms; or things which are thought to be eternal and immutable, such as immaterial substances or intelligences, do not belong to the realm of physics or *natural* science. In Aristotle’s classification of the sciences such beings are the objects of mathematics and metaphysics, or theology. Since, for him, whatever is both sensible and mutable is also material, the realm of nature includes no more than the whole material universe, celestial as well as terrestrial.

The *more* comprehensive sense of nature appears in Spinoza’s identification of nature with the infinite and eternal substance of God. “Besides God,” says Spinoza, “no substance can be nor be conceived . . . Whatever is, is in God, and nothing can either be or be conceived without God.” All finite things are modes of the divine substance or, more precisely, of the attributes of God, such as extension and thought. Nature, therefore, is the totality of finite things, both material and immaterial. But nature exceeds even this totality, for the infinite substance of God is greater than the sum of its parts.

To make this clear, Spinoza employs the distinction between *natura naturans* and *natura naturata*. “By *natura naturans* we are to understand that which is in itself and is conceived through itself, or those attributes of substance which express eternal and infinite essence; that is to say, God in so far as He is considered as a

free cause. But by *natura naturata* I understand everything which follows from the necessity of the nature of God, or of any one of God’s attributes in so far as they are considered as things which are in God, and which without God can neither be nor be conceived.”

Viewed under the aspect of time rather than eternity, the order of nature (*i.e.*, *natura naturata*) is as much an order of ideas as it is an order of things. “The order and connection of ideas is the same as the order and connection of things,” Spinoza writes. “Whether we think of nature under the attribute of extension or under the attribute of thought, or under any other attribute whatever, we shall discover one and the same order, or one and the same connection of causes.”

Except perhaps for the Stoics, like Marcus Aurelius and Epictetus, Spinoza seems to stand alone in this conception of nature as all-embracing. The Stoics too regard nature as the system of the universe, with man a part of its cosmic structure, and with God or divinity inherent in nature as the rational principle governing all things. But with or without reference to God and creation, thinkers like Descartes and Hume tend to identify nature not with the totality of finite things, but with the world of bodies in motion or changing sensible things.

For Descartes, nature does not include the realm of thought or thinking substances, though these, like bodies, are finite and dependent creatures of God. For Hume, nature seems to be that which lies outside experience—in a way, the reality which underlies appearances. Where Spinoza thinks that the system of ideas is as much a part of nature as the system of bodies in motion, Hume speaks of “a kind of pre-established harmony between the course of nature and the succession of our ideas.”

Hume’s distinction between knowledge of the relation between our own ideas and knowledge of matters of fact or real existence seems furthermore to imply that nature is the reality known (however inadequately) when we assert certain things to be matters of fact. Here we perceive another meaning of nature, defined by another basic opposition, this time between the real and the ideal or the imagi-

nary. It is in this sense that medieval writers oppose *entia naturae*, i.e., natural or real beings, to *entia rationis*, or things which have their being in the mind.

THIS DISTINCTION, like most of the others in which nature is concerned, does not have universal acceptance. Kant, as we have seen, far from making nature the reality which exists independently of our experience or knowledge, conceives the realm of nature as identical with all possible experience. "We possess two expressions," Kant writes, "*world* and *nature*, which are generally interchanged. The first denotes the mathematical total of all phenomena and the totality of their synthesis . . . And the world is termed nature, when it is regarded as a dynamical whole—when our attention is not directed to the aggregation in space and time . . . but to the unity in the *existence* of phenomena."

On quite different principles of analysis, Berkeley also treats as natural things the ideas or sensations which "are not produced by, or dependent on, the wills of men." Natural beings do not exist apart from the mind, but unlike imaginary ones, natural beings are those ideas which are not subject to our will or the human mind's own constructive activities. Such ideas are produced in our minds immediately by God.

To the question whether "Nature hath no share in the production of natural things," Berkeley answers: "If by *Nature* is meant the visible series of effects or sensations imprinted on our minds, according to certain fixed and general laws, then it is plain that Nature, taken in this sense, cannot produce anything at all. But, if by *Nature* is meant some being distinct from God, as well as from the laws of nature, and things perceived by sense, I must confess that word is to me an empty sound without any intelligible meaning annexed to it. Nature, in this acceptation, is a vain chimera, introduced by those heathens who had not just notions of the omnipresence and infinite perfection of God."

Berkeley's view represents one extreme position on a theological issue of the utmost difficulty. According to him God is not only

the creator or first cause, but the sole cause of everything which happens in the course of nature. There are no natural causes. Nature has no productive power. Everything is the work of God or the work of man—nothing the work of nature.

Within the limits of this issue, the other extreme consists in denying not the creativity of God, but the role of divine causality in the production of natural effects. It relegates them entirely to the efficacy of natural causes. Lucretius, of course, denies both the creation of the world and the intervention of the gods in the processes of nature. But others, like Descartes, seem to say that once God has created the physical world, once He has formed matter into bodies and given them their initial impetus, their motions henceforward need only the laws of nature which God laid down for them to follow. For everything that happens in the course of nature, natural causes, operating under these laws, suffice.

There is a third position which distinguishes between the work of God in the creation of nature, and the work of nature in the production of effects of all sorts, such as the natural motions of bodies or the propagation of animals. But though it ascribes efficacy to natural agents or second causes in the production of natural effects, it also regards natural causes as instrumental to the hand of God, the first or principal cause of everything which happens as well as of everything which is. Aquinas seems to hold that God acts alone only in the original creation of things; whereas in the preservation of created natures and in their causal interaction, God works through secondary, or natural, causes.

"Some have understood God to work in every agent," Aquinas writes, "in such a way that no created power has any effect in things, but that God alone is the immediate cause of everything wrought; for instance, that it is not fire that gives heat, but God in the fire, and so forth. But this is impossible. First, because the order of cause and effect would be taken away from created things, and this would imply a lack of power in the Creator . . . Secondly, because the operative powers which are seen to exist in things would be bestowed

on things to no purpose, if things produced nothing through them . . . We must therefore understand that God works in things in such a manner that things have also their proper operation."

In other words, according to Aquinas, "God is the cause of action in every agent." Furthermore, "God not only moves things to operate . . . but He also gives created agents their forms and preserves them in being." With regard to the being of things, Aquinas holds that God "established an order among things, so that some depend on others, by which they are conserved in being, though He remains the principal cause of their conservation."

WITH REGARD TO NATURE itself this theological doctrine raises two sorts of problems. The first concerns the efficacy of natural causes, which are sufficient for the scientist to appeal to in explaining natural phenomena, yet are insufficient by themselves for the production of natural effects. The second concerns the distinction between the natural and the supernatural, now not in terms of the created and the uncreated, but in terms of what happens naturally (or even by chance) as opposed to what happens as a result of God's intervention in the course of nature.

Miracles, for example, are supernatural rather than natural events. They are not produced by natural causes; nor do they happen by accident. They are attributed by the theologian to divine causality, yet not in such a way that violence is done to nature. "The term *miracle*," Aquinas explains, "is derived from admiration, which arises when an effect is manifest, whereas its cause is hidden . . . A miracle is so called as being full of wonder; in other words, as having a cause absolutely hidden from all. This cause is God. Therefore those things which God does outside the causes which we know are called miracles."

The miraculous is that which is beyond the power of nature to accomplish. "A thing is said to be above the ability of nature," Aquinas writes, "not only by reason of the substance of the thing done, but also because of the manner and the order in which it is done"; and "the more the power of nature is

surpassed, the greater the miracle." Aquinas distinguishes three grades of miracles.

The first, he says, surpasses nature "in the substance of the deed; as, for example, if two bodies occupy the same place, or if the sun goes backwards, or if a human body is glorified. Such things nature is absolutely unable to do; and these hold the highest rank among miracles. Secondly, a thing surpasses the power of nature, not in the deed, but in that wherein it is done; as the raising of the dead, and giving sight to the blind, and the like. For nature can give life, but not to the dead, and it can give sight, but not to the blind. Such hold the second rank in miracles. Thirdly, a thing surpasses nature's power in the measure and order in which it is done; as when a man is cured of a fever suddenly by God, without treatment or the usual process of nature . . . These hold the lowest place in miracles."

Though "each of these kinds has various degrees, according to the different ways in which the power of nature is surpassed," no miracle, according to Aquinas, transgresses the order of nature in the sense of accomplishing the impossible. Unlike the impossible, which would destroy nature, the improbable can be elicited by God's power within the general framework of nature.

Hume, on the other hand, thinks that "a miracle is a violation of the laws of nature." And since, in his view, a firm and unalterable experience has established these laws, the proof against a miracle, from the nature of the fact, is as entire as any argument from experience can be. "Why is it more than probable," he asks, "that all men must die; that lead cannot, of itself remain suspended in the air; that fire consumes wood, and is extinguished by water; unless it be, that these events are found agreeable to the laws of nature, and there is required a violation of these laws, or in other words, a miracle to prevent them?"

"Nothing is esteemed a miracle," Hume continues, "if it ever happens in the common course of nature . . . There must, therefore, be a uniform experience against every miraculous event, otherwise the event would not merit that appellation. And as a uniform experience amounts to proof, there is here a direct and

full *proof*, from the nature of the fact, against the existence of any miracle; nor can such a proof be destroyed, or the miracle rendered credible, but by an opposite proof which is superior."

Hume does not think that miracles can be proved against our uniform experience of the order of nature. But he also thinks that they are "dangerous friends or disguised enemies to the *Christian religion*" who would try to defend its beliefs "by the principles of human reason . . . The *Christian religion* not only was at first attended with miracles," he declares, "but even at this day cannot be believed by any reasonable person without one. Mere reason is insufficient to convince us of its veracity; and whoever is moved by *Faith* to assent to it, is conscious of a continued miracle in his own person . . . which gives him a determination to believe what is most contrary to custom and experience."

ONE OTHER TRADITIONAL conception of nature, implicit in much of the foregoing, should be noted. The various senses of the term so far explicitly considered are alike in this: that they justify the use of the word "Nature" with a capital "N" and in the singular. This other sense of the term appears when we speak of each thing as having a nature of its own, and of the world as containing a vast plurality and radical diversity of natures.

In this sense we attribute a nature even to things which are contrasted with Nature and the natural. We speak of the nature of God and the nature of freedom, the nature of art, the nature of reason, the nature of ideas, the nature of the state, the nature of customs and habits. This could, of course, imply a theory that things which are not completely natural, nevertheless have a natural basis, as art, the state, or habit. Another meaning, however, seems to be involved.

The phrase "nature of" appears almost as frequently in the great books as the word "is," and frequently it is unaccompanied by any explicit theory of Nature or the natural. The discussion of the *nature* of anything seems, for the most part, to be a discussion of *what* it is. To state the nature of anything is to give its

definition; or if for any reason definition in a strict sense cannot be given, then the attempt to state the nature of the thing consists in trying to say what characterizes this thing or kind of thing, in distinction from everything else or all other kinds.

Enumerating the senses of the term 'nature,' Aristotle gives this as the fifth meaning. The first four comprise senses which distinguish the natural from the artificial or the immutable, and which indicate that the natural or the physical has an immanent principle of movement in itself and involves matter or potency. The fifth sense is that in which 'nature' means "the *essence* of natural objects"; and, as he goes on to say, this implies the presence in them of form as well as matter. "By an extension of meaning from this sense of 'nature' every essence in general has come to be called a 'nature,' because the nature of a thing is one kind of essence." This is the sixth and most general sense, according to which the nature or essence of anything is the object of definition.

Does each individual thing have a nature peculiarly its own, even if it cannot be defined? Or is a nature or essence always something common to a number of individuals, according to which they can be classified into kinds, and the kinds ordered as species and genera? Do John and James, for example, have individual natures in addition to the common nature which they share through belonging to the human species; and does their human nature entail certain properties which are generic rather than specific, *i.e.*, which seem to be determined by their having the generic nature common to all animals as well as the specific nature common to all men?

Such questions about individual, specific, and generic natures raise problems of definition and classification which are discussed in the chapter on EVOLUTION. They also raise problems about the existence or reality of the *kinds* which men define and classify. Are they merely what Locke calls "nominal essences," or do our definitions signify real essences, *i.e.*, the natures of things as they really are? Is the real world one which, as William James says, "plays right into logic's hands"? Does Nature

consist of a *hierarchy* of natures or distinct kinds; or is it a *continuum* of things all having the same nature and differing from each other only individually or accidentally, but not essentially? These problems are discussed elsewhere, in such chapters as ANIMAL, DEFINITION, EVOLUTION, LIFE AND DEATH, and SAME AND OTHER.

In the 20th century, Whitehead introduces what he calls an "organic theory of nature." This doctrine "cries aloud for a conception of organism as fundamental for nature," and he explains this by saying that "the whole

point . . . is the evolution of the complex organisms from antecedent states of less complex organisms." For Whitehead, science is now "taking on a new aspect which is neither purely physical, nor purely biological. It is becoming the study of organisms. Biology is the study of the larger organisms; whereas physics is the study of the smaller organisms . . . The organisms of biology include as ingredients the smaller organisms of physics." In Whitehead's organismic view of nature, the old issue between mechanism and vitalism becomes irrelevant.