

CHAPTER FIVE

THE FINAL CAUSE

We come now to what might be called the penultimate position of the materialists - the negation of the final cause in the operations of nature. This denial of the causality of the end takes the form of the assertion that, regarding the goals actually achieved in nature, all is a product of chance. There are four arguments offered in support of this contention. In the order in which we are going to treat^{of} them, they are: 1) the fact that the natural agent lacks knowledge of the end renders unintelligible the assertion that it acts for the sake of the end; 2) there is no evidence that intention is found in the works of nature; 3) the mere existence of material causality precludes the possibility of a final cause; and 4) the many monstrous products of nature demonstrate its lack of purpose.

The first argument against finality in nature is that which was presented by A.G. Ramsperger. It is his contention that, without assuming knowledge of the end on the part of the natural agent, it is meaningless to speak of the end as being a cause of its actions. Though he admits that the activities of many natural things seem to indicate purpose, he immediately adds: "But when we inquire how the future ends can direct present activities, we find that this is completely unintelligible, unless we are willing to suppose that moths and

vegetables are motivated by the ideas of anticipated goals". This supposition he quite legitimately rejects. He then presents the principle on which he bases his denial of purpose in all but intellectual agents: "Behavior is explained by purposes only on the supposition that it is conditioned by actual thoughts or images of the expected outcome, that exist at the time of the behavior" (1).

Now, as we noted in the chapter devoted to an exposition of materialism, Ramsperger's argument is valid only if action for an end necessarily involves knowledge on the part of the one acting. Only if this be assumed can one deny the possibility of intention in nature. And it is this very assumption that we challenge. For there are, in fact, two ways in which a thing may be said to act for an end: either as directing itself to the end, or as being directed by another. It is in this latter manner that the natural thing acts for an end. As St. Thomas states:

It must be observed that a thing tends to an end, by its action or movement, in two ways: first, as a thing moving itself to the end - such as man; secondly, as a thing moved by another to the end, as an arrow tends to a determinate end through being moved by the archer, who directs his action to the end. Therefore those things that are possessed of reason move themselves to an end; because they have dominion over their actions through their free will, which is the faculty of will and reason. But those things that lack reason tend to an end, by natural inclination, as being moved by another end not by themselves; since they do not know the nature of an end as such and consequently cannot ordain anything to an end, but can be ordained to an end only by another. (2)

Accordingly, it is proper to the rational agent to know the end as such and to direct itself to the end. This is not the case with irrational animals, for example, who possess only sense knowledge, nor with those things which lack knowledge altogether. (3) Rather, they are moved to the end by another, and in lieu of knowledge of the end possess a natural inclination toward it, or what is also called a natural appetite. The direction by another is closely related to this natural inclination or appetite, but let us first consider the notion of such an appetite.

What we mean by the natural appetite is simply an innate tendency in the thing to act in a determinate fashion and to realize a determinate end. The inherent aptitude to so act follows from the form of thing. This is brought out in the Summa Contra Gentiles:

Through the form which perfects it in its species, the natural thing has an inclination to its proper operation and to the end which follows these operations: for as the thing is, so it acts and tends to what is fitting to it. (4)

In another text, St. Thomas directly relates the form as that from which determinate action follows to the direction of the natural agent by another. As he states in this text, the form of the natural thing, which is the source of its inclination and action toward the end, is itself derived from another. And so, the cause of this form is the first principle of the natural thing's action for an end:

If a thing has no knowledge of the end, even though it have an intrinsic principle of action or movement, nevertheless, the principle of acting or being moved for the end is not in that thing, but in something else, by which the principle of its action toward an end is imprinted upon it. Wherefore such like things are not said to move themselves, but to be moved by others.(5)

We find much the same theme in still another text.

There St. Thomas calls attention to an appetite which arises from knowledge which exists, not in the subject of the appetite, but in some other. And it precisely this which we call the natural appetite. Natural things tend toward what is proper to them by reason of knowledge which is not in them, but in the Author of their nature.(6)

It is, therefore, God who directs things to their end. And thus is it possible for an agent which lacks knowledge to act for an end; for the required knowledge is found in its first cause.

Because the natural thing is determined in its being, and has but one inclination to a determined thing, no knowledge is required whereby, in accordance with some notion of the appetible, it could distinguish what is desirable from what is not. But such knowledge is prerequisite in the One who forms the nature, and who gives each nature the inclination proper to it.(7)

We find an even stronger emphasis upon this intimate relation between the natural inclination or appetite and God as directing the natural agent to the end, in the second definition of nature arrived at by St. Thomas. As we have seen, it is from the formal nature of

the thing that the active inclination toward a determinate end flows. Thus the first definition of nature (which applies to both the form and the matter) runs: "The principle and cause of motion and rest in that in which it is primarily and per se and not accidentally." (8) However, when the question of finality in nature is taken up in Book II of the Physics, St. Thomas immediately states:

This pertains to the question of providence, because those things which do not know the end tend to an end only as directed by something which knows, as the arrow by the archer. Thus, if nature operates for an end, it is necessary that it be ordered by something that is intelligent, which is the work of providence. (9)

Accordingly, following the proofs that nature is among those things which act for the sake of an end, St. Thomas posits this definition of nature:

Thus it is evident that nature is nothing else than the ratio of a certain art, namely, the divine, placed in things by which the things themselves are moved to a determined end. (10)

We see, then, that though purposeful action ultimately requires knowledge of the end, it need not be possessed by the one acting. For this reason Ramsperger's a priori rejection of finality in nature is without foundation. The question in dispute can only be solved by determining whether or not natural agents reveal an innate inclination toward the end. And that such an inclination actually exists we shall show in treating of the second argument against purpose in nature.

H. Heath Bawden presents an adequate formulation of the argument which holds that there is no evidence for intention in the works of nature. It will be recalled that he adumbrated the development of the complex forms of life in the following manner: "One living cell divided into two or joined with another cell, and the race began. Certain protein organizations developed chromosomes, genes, enzymes, hormones, and even manufactured vitamins in the digestive tract." Having thus accounted for the coming-to-be of living things, the author continued: "In a world of spontaneous variations and random reactions anything could happen, and we (mankind) are an example of what did happen. There is no scientific evidence that what happened was the result of premeditated design. Adaptation of means to ends took place in the same fortuitous way that a spinning proton will enter the nucleus of an atom, turning it into an isotope, or a spinning neutron will throw off a revolving electron, thus altering its electro-dynamic status. (11)

Our reply to this particular argument will consist in an exposition of the proofs that nature acts for an end which are found in Book II of the Physics. In that work, the issue is joined immediately after an account of the ancients' position that chance rather than intention explains how certain results are obtained in the operations of nature. And the first argument rests precisely upon a distinction

that must be drawn between the events which come about by nature and those which come about by chance. Now, it is those events in nature which come about for the most part that we term "natural". The reason for this is that, on the basis of their frequency, we can see that there must be a determinate principle of their coming-to-be. An example would be that of the incidence of a certain characteristic among men - say, to have two feet. This is the principle we call nature, and, as we noted above, it is defined as "The principle and cause of motion and rest in that in which it is primarily and per se and not accidentally." That it actually exists is evident. (12) On the other hand, we would attribute to chance - i.e., to an indeterminate, fortuitous cause - characteristics which, in the same class of things, occur rarely. Thus the first part of this argument runs as follows:

All things which come to be naturally either come to be always or frequently; but none of those things which come to be by fortune or by the intrinsically vain, i.e., chance, come to be always or frequently. Thus we do not say that it is by fortune or chance that it rains in the winter. We would, however, say that it was by chance if it were to rain very much during the dog days. In the same way, we do not say that it is by chance that we have heat during the summer, but only if this occurs in winter. (13)

The distinction between events which come about naturally, and thus for the most part, and those which come about by chance, and thus infrequently, has still another aspect worthy of note. For what we term a chance or casual event is defined as that which happens

outside the intention of the end. For example, we would say that it was by chance that, in going to the market to purchase household materials, a man should encounter his debtor. (However, were this encounter to happen always or frequently, it would be clear that it was, in fact, intended by the creditor.) There are, therefore, two characteristic features in such events: rarity of occurrence and absence of intention. Both may be grouped under the proposition that chance events are indeterminate in their cause. Now natural events are, as we have seen, those which come to be "ut in pluribus." In affirming this, we implicitly deny that they are products of chance. And, in addition, we thereby affirm that they are intended. For, that the determination of the process and result is due to the end is consonant with the fact that, as a rule, the end is realized.

All things which come to be are either by chance or by an end, for those things which happen outside the intention of the end are said to happen casually. However, it is impossible that those things which come to be always or frequently happen by chance. Therefore those things which come to be always or frequently come to be for the sake of something. But all those things which come to be according to nature come to be always or frequently, as even those who deny intention in nature admit. Therefore all those which come to be by nature come to be for the sake of something. (14)

The validity of the principle that a determination from the end is established on the basis of frequency, is generally recognized. We may see this in an article by N. Wiener and

A. Rosenbluth entitled "Purposeful and Non-Purposeful Behavior", which appeared in a recent issue of Philosophy of Science. The authors, in the article from which we quote, seek, quite vainly, to prove that "intrinsic purposefulness" may be imputed to certain mechanical devices which manifest a definite behavior pattern with respect to a given end. We cannot, of course, accept this view as valid, for there can be nothing "intrinsic" to any artificial thing such as a machine. However, in seeking to prove their assertion, they do set forth some valuable criteria for determining whether or not an action is purposeful. Some of these concern chance. They write:

The recognition of purposeful behavior requires that several observations be made with the system exposed to different initial or subsequent conditions. Repetition with varying conditions is indispensable to eliminate random conditions. It is also necessary to ascertain that the particular relation between the acting object and the constituents of the system interpreted as the goal was not reached by the independent development of processes which fall into phase at a given moment.
(15)

The argument proposed by Wiener and Rosenbluth is clear enough. What they demand is evidence that the course of any given process is not determined by the chance confluence of external factors. Once such evidence is gained, the conclusion to be drawn is evident: the ordination to the end must be attributed to a principle intrinsic to the "acting object". Now, in so far as natural things are concerned,

the observations which the authors rightly view as necessary to determine action for an end have, of course, been made for some thousands of years. The "repetition with varying conditions" is also something to which all natural things have been, and are, subjected to at nearly all times. It is certain that we cannot attribute to "random coincidences" the development, say, of the eyes of the various animals. And, again, that the factors in the development of any given living thing did not just "fall into phase at a given moment" is a truth beyond dispute. In view of these truths, it is clear that we must, at least, impute purpose to nature.

As is perhaps apparent, the arguments advanced by Wiener and Rosenbluth, when applied to nature, simply manifest the presence of an intrinsic factor in things to accordance with which they tend toward determinate ends. This means that the acknowledgement of finality in nature must follow upon recognition of that intrinsic principle of motion and rest in things which we call "nature". And that such is indeed the case may be seen from a passage in Ernst Cassirer's work "The Problem of Knowledge". In the section from which we quote, he discusses the writings of the biologist W. Roux, who attempted to account for the activities of living things in terms of their physico-chemical composition. However, notes Cassirer, this mechanistic approach toward such beings encountered radical difficulties.

For it proceeded upon the assumption that the factors with which the investigator dealt "are entirely uniform, none showing any qualitative difference from the others, "and that each "has simply a numerical value". That such is not the case in biology, Cassirer continues, Roux was forced to concede:

But in the study of organic phenomena we can never achieve such a reduction to homogeneous number, for here we encounter a specific difference in the elements themselves, a difference of 'form'. In trying to describe an organism and to trace its development we must always reckon with this form and with an original 'disposition' in the organism. Here certain specific causes are always governing alongside the external conditions, and these Roux called 'determination factors', since they give a determinate direction to what occurs. Fish, amphibian, or invertebrate eggs in the same brook or pool, and eggs of various birds in the same incubator, all develop differently, in spite of a similar environment, and typically so, that is to say, they develop into beings of its own class, genus, and species. (16)

It is to be noted that, in the above passage, no explicit mention is made of finality in the development of living organisms. Cassirer limits himself to an exposition of the fact that organisms manifest formal differences and thus "specific causes" or "determination factors" which give a definite direction to their development. However, in so doing he is implicitly affirming the existence of purpose in nature. For it was this very determination in the operations of nature on which the proof for finality found in the Physics was based.

As well, it was but a slight variation of Wiener and Rosenbluth's criterion for determining whether or not an action is purposeful, which led Roux to posit an intrinsic principle of its development in the organism. While Roux held to "determination factors" because different organisms, under the same conditions, took different directions in their development, Wiener and Rosenbluth held to "intrinsic purposefulness" because the same "acting object" achieved the same goal under varying conditions.

In the light of this relation between the recognition of nature and the affirmation of purpose in its operations, we can understand St. Thomas' assertion that those who deny that nature acts for an end negate nature and those things that are according to nature:

For those things are said to be according to nature which are moved without interruption by some intrinsic principle until they arrive at some end; and these are not moved by just any principle to just any end, but by a determined principle to a determined end, because one proceeds from the same principle to the same end unless something prevents this. (17)

The second argument concerns the design which is revealed in the processes of nature. It uses an analogy taken from art. Its tenor is as follows. Wherever we find an ordered sequence of events issuing in a determinate result, there we find that we call rationality. That is to say, when each prior stage in the process finds its reason only in the succeeding one, and, finally, in the ultimate result, we see

that the prior stages are understandable only in terms of the final issue. The parts of a house and the work performed to make it, have their reason in the house as a shelter for man. Apart from this end, the building materials and the work of building would be absurd. Now, in nature we find a similar sequence - for example, that involved in the generation of a living being. Here, and in similar cases, the process of generation follows an altogether rational pattern. But if the seed, the egg, and the evolution of the embryo were not ordered to the birth of a new individual, their existence and apposition would not have the rationality which is theirs because of this final issue. Everyone admits that when those previous stages do not reach such a term, something is wrong - even when we know why something went wrong. This can be true only if the previous stages were realized for the sake of the final issue. In other words, these processes lead us to see in such natural things an innate design.

When we affirm that natural processes reveal an innate design, we are implicitly distinguishing such processes from those found in art. Artistic actions spring from an elicited appetite, and thus presuppose knowledge. In nature, on the other hand, action for an end follows from an inborn aptitude for, or an inborn inclination toward, the end. Such an appetite we call "natural", and, as was noted in the first section of this chapter, it does not involve knowledge of the end.

Such an appetite we call "natural", and, as was noted in the first section of this chapter, it does involve knowledge of the end. The precise meaning of the "desire for the end" in the case of nature is brought out by St. Thomas in his general statement of the argument we are now considering.

In anything where there is an end, both the prior and those things which follow are done for the sake of the end. This being supposed, the argument is as follows. As something is done naturally, so it is innately apt to be done, because by naturally is meant innately apt. And this proposition is convertible, because as anything is innately apt to be done, so it is done; but we must add the condition, unless it be impeded. Therefore we take first that which does not have an exception, namely, that as something is done naturally, so it is innately apt to be done. But those things which come to be naturally are so done that they are brought to an end; therefore they are innately apt to be done so that they are for an end. And this is what we mean when we say that nature desires an end, namely, that it has an innate aptitude for the end. (18)

The most important part of this argument is the statement that nature performs its operations and realizes its goals in a determinate and orderly fashion. For it is this which permits the conclusion that nature orders the prior to the posterior and ultimately to the end: the design which we attribute to nature is revealed in the determinate sequence of events which is characteristic of its operations. Thus it is the relation between the prior and the posterior in the order of efficient causality which implies the

relation between the prior and the posterior in the order of final causality. Now, as was stated above, the order found in nature's operations has its counterpart in art. For both activities, the natural and the artistic, are based upon an identical relation of the prior to the posterior. And, indeed, because of this essential similarity, we can say that each would - were it so capable, - accomplish the work of the other in the same manner as the other. Thus, for example, nature would construct a house just as the human artisan does. This is established by the like method which it adopts in the generation of plants. In turn, art would follow nature's procedure in the production of that which is actually made by nature. This is revealed in activities which may have either art or nature as their principle, such as those that seek to restore health.

What has been said may be shown by an example, because we arrive at the posterior from the prior both in art and in nature. Thus if artificial things, such as a house, were to come to be by nature, they would come to be in that order in which they now come to be by art. For example, first the foundation would be built, afterwards the walls, and finally the roof would be added. This is the way nature proceeds in that things which are attached to the earth, namely, in plants, whose roots, like a foundation, are fastened to the earth, while the trunk, like the walls, is up in the air, and the leaves are over everything like a roof. Similarly, if those things which come to be by nature were made by art, they would come to be in the way in which they are innately apt to come to be by nature. This is evident in health, which is produced both by art and by nature, because just as nature heals by heating and cooling, so also does art. Thus it is clear that in nature one thing is for the sake of another, namely, the prior for the sake of the posterior, just as it is in art. (19)

As St. Thomas notes, the third proof for finality in nature is but a complement and explanation of the preceding one. For it, too, brings to the fore the identical relation of the prior to the posterior (in the order of efficient causality) in both art and nature. However, we use the principle that art imitates nature. The example given to illustrate this principle is again that of health, which is something that comes to be by both nature and art. There, as we saw, man simply follows the lead of nature, in applying the remedies first suggested by this intrinsic principle of things. Thus, in this and similar cases, art is but an application to things, by man, of this order of the prior to the posterior that is first noted in natural operations. Therefore, we must conclude that, as in art, those things that come to be by nature are for the sake of an end.

Art does certain things that nature cannot do, as making a house and the like, but in those things which can come to be both by art and by nature, art imitates nature, as is plain in the aforesaid example of health. Therefore if those things which come to be in art are because of an end, it is clear that those also which come to be by nature come to be because of an end, since the prior and the posterior are similarly related in each. (20)

The fourth proof draws upon what Aristotle terms the most obvious instances of purpose in nature. He refers to the actions of animals, which, though not caused by knowledge of the end as such (that is, there is no knowledge of the relation of means to ends)

are clearly for the sake of certain ends. Again, quite certain evidence of intention is found in the case of plants, where we see the development of parts for the sake of the whole. This last is usually formulated in the expression that nature adapts means to ends, and is, of course, found in the development of any living being.

It is most evident in animals that nature acts because of something, for these act neither by inquiry nor by deliberation. Still, it is clear in their operations that they act because of something. Because of this, some ask whether spiders, ants and similar animals operate by intellect or some other principle. It is clear, however, that they do not act because of intellect, since they always operate in the same way. Every swallow makes its nest in the same way, and every spider its web, which would not be true if they operated by intellect and art. For every builder does not make a house in the same way, because the artist has the ability to judge about the form of the artificial thing and can vary it. And, proceeding from animals to plants, we see in these that some things are made to be useful for an end. For example, the leaves are useful for protecting the fruit. Therefore, if all these, namely, the swallow making its nest, the spider its web, the plants producing foliage to protect the fruit, and the roots in plants being below rather than above, so that they can take their nourishment from the earth, are by nature and not by art, it is evident that the final cause is found in those things which come to be and exist by nature, namely, by nature operating because of something. (21)

The fifth and final argument presented has two aspects.

One of these concerns the form as the end of natural generation; the other, the relation between the matter and the form. In order to understand the second aspect, we must turn back to the end of Book I of the Physics, where the nature of the relation between

the formal and material principles of things is fully developed. But first, let us offer the argument itself:

Since nature is spoken of in two ways, namely, of both the form and the matter, and the form is the end of generation, as was said above (Book II, Lesson 12) - while it is of the nature of the end that other things come to be because of it - it follows that existence and becoming for the sake of something is found in natural things. (12)

This proof first of all calls attention to the fact that the term of nature's operations is the form of the natural thing. But, as we have seen, that toward which nature tends is the cause of its action. Consequently, the entire process of coming-to-be has the form as its final cause; it is this which nature seeks to realize by means of its operations.

We might now ask for what, precisely, the form is the end. For one, we can say that it is sought by the natural agent, which naturally inclines toward the production of such an effect. But, in addition, we can say that it is an end for the matter, which is ordered to the form by its very nature. And this truth brings us to the second aspect of the argument.

The relationship between matter and form is, as we stated above, developed in the preceding book of the Physics. There the form of a thing is spoken of as "something divine, optimum and appetible".

It is called something divine "because every form is a certain participation of the similitude to divine existence, which is pure act, because each thing is in act insofar as it has form". It is optimum "because act is the perfection of the potency and is its good." And thus "it follows that it is appetible, because each thing desires its own perfection." As the statement on form as "optimum" indicates, that for which the form is appetible and a good is the matter, which is the potential principle. Thus, writes St. Thomas, "matter, which is other than form and privation, is innately apt to desire and seek form by its own nature". The reason why the form is the good of the matter is found in the statement that the form is that through which the matter has existence. And, as St. Thomas explains, the appetite that the matter has for the form is nothing other than its ordination to form in accordance with its proper nature. (23)

With this last proof we end our discussion of the argument which holds that there is no evidence for purpose in nature. Contrary to that thesis, we have shown that the operations of nature manifest a determination from the end, order and design, adaptation of means to ends, and a gratification of natural appetites. All these reveal that innate aptitude for the end which, as St. Thomas states, is what is meant when it is said that nature acts for an end.

The third objection raised by materialists against attributing purpose to the operations of nature derives from the mere existence of the concomitant causality of the prior material factors. The formulation of the position that we shall accept as representative is that of F.J.E. Woodbridge. The first illustration offered in proof of the entire adequacy of the material factors to account for all that occurs in nature is that of the development of vegetation about the shores of a lake. This, it is maintained, is explained by "the fact that water and soil happens to meet there under certain conditions." This fact, it is next asserted, "excludes any other explanation of the resulting order". He then continues: "And it has not been difficult to extend a similar explanation to the marvelous structures and functions of animals. Its apparent incredibility when so extended steadily diminishes with greater familiarity with the facts and with increased experimentation, until it becomes no longer easy - it may, indeed, become impossible - to think of nature as a work of art." (24)

As we see, Woodbridge's argument falls into two parts. First it is maintained that, given a prior cause, recourse to a final cause is implausible. Following this, it is asserted that, given a prior cause, an explanation in terms of the causality of the end is impossible. Our consideration of these two points will be brief. We hold the first assertion to be question-begging, and the second to involve a very apparent absurdity.

When Woodbridge states that the material factors are entirely adequate to account for the development of natural things, he is clearly assuming the question at issue - namely, whether or not these factors and the effects which they produce are ordered to an end. For it is impossible to reduce all causality to that which is prior in existence, except on the condition that there be no final cause. Thus, the author's argument is really nothing more than a re-affirmation of the position that he purports to establish. As well, in limiting causality to the prior causes, Woodbridge falls into the error of denying nature altogether. For, as was noted in an earlier section of this chapter, "those things are said to be according to nature which are moved without interruption until they arrive at some end; and these are not moved by just any principle to just any end, but by a determined principle to a determined end..." Therefore, when Woodbridge disputes a determination from the end in the development of living beings, he is implicitly denying that such a development is according to nature.

What now of the assertion that the causality of that which is prior in existence "excludes any other explanation of the resulting order"? The futility of this is evident when we consider that artistic endeavours also involve a prior as well as a final cause. Are we to conclude from this that a final cause of artificial things is an a priori impossibility? Consistent with his position on nature, such should be the conclusion drawn by Woodbridge. In fact, however,

he is somehow able to reconcile the joint causality of the end and of the prior cause in human activities. For he admits that "the arrangement of plants in a garden may show the gardener's taste and skill". And before this, he had offered a very apt illustration of the way in which both the prior and the final cause are found in productive actions. Thus: "Asking why the loom so successfully weaves the colored fabric, we get the answer, it was made in order that it might do precisely that which we admire."(25) In view of this acceptance of the causality of the end in artificial things, it is clear that his denial of its very possibility in nature did not derive from any rigorous analysis of the relation between the end and the prior causes. If such an analysis had been seriously attempted, Woodbridge would have seen that, far from being in opposition to one another, the end and the prior causes are complementary. For, as was pointed out in our introductory chapter, the end is the cause of the other causes, in the sense that it is the cause of their causality. In turn, the prior causes are the cause of the being (but not of the causality, which would be contradictory) of the end. And so, the one does not exclude the other; rather, it demands the other.

The final objection proposed by the materialists has to do with the errors committed by nature in its operations. One supposed example of this was offered by Empedocles, who claimed that there once existed "man-faced ox-progeny". More certain instances are to be found in the various deformed and monstrous living beings which, while infrequent, do indeed come to be. In view of such cases as these, it is demanded, how can it seriously be maintained that nature intends the ends it brings about? Should we not, rather, accept the hypothesis of chance and attribute all to accidental variations in the initial material conditions? For, under this hypothesis, both good and evil become rational, since neither violates any prior conception of what should arise out of nature's activities.

This objection apparently rests upon the false assumption that nature is a necessary cause. If this were so, and if there were no possibility that nature's efforts might be impeded, the problem would indeed be a serious one. For we would then have to attribute intention to nature as regards both its failures - precisely as failures - and its successes, which is clearly impossible. Actually, however, nature is not a necessary cause; there is, therefore, every reason to expect that it might, on occasion, be frustrated. And since error is also encountered in art, its existence in nature establishes nothing so far as intention is concerned. The errors

of the artist do not prompt us to assert that he acts without purpose - why, then, should a similar happening in nature be considered as evidence that nature acts without purpose? Further, the very fact that we do denominate some things as monsters indicates our awareness that nature does intend certain ends. The point here is the same as that brought out in our discussion of the second proof for finality in nature. It is granted by all that when nature does not achieve a certain goal, something is wrong. This is the case even when the reason for the failure to realize such an end is known. But this can be true only if nature intended the end in question.

Both of the above points are made by St. Thomas in his rejoinder to this particular argument:

Although art acts because of something, still it happens that sin comes to be in those things which come to be by art, because sometimes the grammarian does not write correctly, and the doctor sometimes gives someone the wrong dose. Thus it is evident that sin occurs also in those things which exist according to nature, even though nature operates because of something. Moreover, of those things which come to be because of something in art, some come to be according to art, and they come to be correctly; but there are some in which the artist, not acting according to art, fails. In these sin occurs, since art acts because of something, for if art did not act for a determined end, there would be no sin no matter in what way the art operated, because the operation of the art would be the same for all things. Therefore, the fact that sin is found in art is a sign that art acts because of something. The same thing happens in natural things, in which monsters are as sins of a nature acting for the sake of something, insofar as the right operation of nature is deficient. The fact that sin is found in natural things is a sign that nature acts because of something. (26)

We might now ask what, precisely, the generation of monsters

means. Actually, only that these imperfect specimens of different kinds result from seeds or eggs of such initial poor quality that normal development was impossible. Certainly, a diseased parent, for example, will very likely engender deficient offspring. Thus we can only say that, owing to a corruption of some natural principle, nature was unable to realize its intended goal.

Therefore, in the substances which Empedocles said were constituted in the beginning of the world 'ox-progeny', i.e., half ox and half man, if they could not arrive at some end and term of nature such that they would be conserved in existence, this was not because nature did not intend this, but because these things which it was not possible to save were not generated according to nature but by a corrupt natural principle - just as even now it happens that some monstrous parts are generated because of the corruption of the seed. (27)

We might well also call attention to the fact that, contrary to the materialists' argument, a determinate order of proceeding, and thus action for a determinate end, are truly characteristic of nature. This is apt to be overlooked when one concentrates upon nature's failures. Hence, for yet another reason, from the existence of these failures one cannot conclude that nature acts without purpose.

Wherever there are determined principles and a determined order of proceeding, there should be a determined end for the sake of which the other things come to be. But in the generation of animals there is a determined order of proceeding, because the seed should come to be first, and the animal does not exist immediately from the beginning; and, again, the seed itself is not immediately enclosed in a hard shell, but is in the beginning soft, and tends to perfection in a certain order. Therefore, there is a determined end in the generation of animals. And so, monsters and sins in animals do not happen because nature does not act for the sake of something. (28)