

CHAPTER SIX

THE NECESSITY PROPER TO NATURE

There remains but one of the principal doctrines of materialism to be accounted for. We refer to the position that natural things come to be "ex necessitate materiae". In a very important sense, this was disproved in the preceding chapter, where it was shown that nature acts for an end. This being so, the assertion that the end of natural generation is a pure result of the given material conditions - which is essential to the belief that it comes to be from the necessity of matter - is seen to be false. However, it might yet be maintained that the natural thing is, in fact, necessitated in its existence by its material cause. Accordingly, we must take up the problem anew and show why this, too, is impossible. In our analysis of this question, the most important principle that we will bring to bear is that the operations of nature are for the sake of the end. For this truth is the decisive factor in determining the necessity proper to nature.

Our purpose in the present chapter is threefold: one, to show the error of the materialist position; two, to establish the essentially subordinate status of the material principles in the generation of things; and three, to bring to light the necessity actually found in natural generation.

Let us consider once more the materialistic view of necessity in nature. It will be remembered that the operations of nature are compared to the sequence of events encountered in the phenomenon of rain. Each stage, that is, in any given system is thought to be the mere consequence of antecedent and present physical factors. And assuming the existence of such factors, their effects are held to follow with an absolute necessity. A similar notion is extended to the coming-to-be and development of natural things. As Aristotle writes in the *Physics*:

Why then should it not be the same with the parts in nature, e.g., that our teeth should come of 'of necessity' - the front teeth sharp, fitted for tearing, the molars broad and useful for grinding down the food - since they did not arise for this end, but it was merely a coincident result; and so with all other parts in which we suppose there is a purpose. (1)

As we know, precisely the same sort of interpretation of the organs and properties of living beings would be presented by the modern proponents of materialism. For example, in accounting for the existence, the structure and the function of the human eye, the following general explanation would be offered: given the determinate relationships between its physical and chemical constituents, these are simply the necessary result. Or if it were asked why man possesses such a pronounced flexibility in his hands, the reply would be that their physical make-up necessitates this very

flexibility. No explanation in terms of other causes could be considered, since, in principle, all causality in nature is reduced to the matter. And, needless to say, a similar interpretation is applied to the generation of natural substances in their entirety.

In his critique of this particular approach toward the generation of natural things, Aristotle compares it to one in which the coming-to-be and existence of a house would be explained solely in terms of its material components. As St. Thomas writes in his commentary:

Some think that the generation of natural things comes from the absolute necessity of matter. This is just as if one were to assert that the walls of the house are as they are from the necessity of matter, because the light things appear above and the heavy things are likely to rest on the bottom. For this reason (it would be held) the solid and heavy stones remain in the foundation, while the earth is placed above the stones because it is lighter, as is found in walls made of bricks, which, in turn, are made of earth. Then wood, the lightest of all, is placed on top, i.e., on the roof. In the same way, they believe that the dispositions in natural things come from the necessity of matter, as if man has feet below and hands above because of the heaviness and lightness of the body's fluids. (2)

Now, there would be three manifest errors in so explaining the existence of an artificial thing such as a house. First of all, it is not taken into account that the being of the house as such does not derive from the matter alone. But, in fact, the disposition of the material parts - their organization into a determinate accidental

whole - comes, not from the parts themselves, but from the order imposed upon them by the builder of the house. Secondly, the action of this builder is ignored, and thus implicitly denied. But, as is apparent, his action in accordance with the art of building is the efficient cause of the coming-to-be of the house. Finally, it is overlooked that the house comes to be for the sake of an end: the sheltering of human beings. And in overlooking this truth, one other fact is neglected - that the parts of the house are selected and disposed with just this end in view. For example, the builder chooses and fashions the material of the walls in order that the walls might serve the purpose of supporting the roof and the floors. And so far as concerns the causality of the material parts of the whole structure, it is limited to their role of composing the thing: they are the material cause and no more.

Now all this is so obvious that it may appear hardly worth mentioning. It is certain that the matter alone does not suffice for the existence of the house, and that one must have recourse to all four causes in order to account for its existence. Above all, it is evident that one must turn to the intention of the builder in order to account for his activities and the materials he utilizes in his productive effort. The reason for this is that he operates for an end; that is, his actions and that which he constructs have a final cause. Consequently, it would be an unqualified absurdity

to hold that a house comes to be solely as a result of its material cause, and to state, as well, that it comes to be of necessity in the absolute sense of this term. All this, it is granted, is only too evident. And yet, everything which we have noted is of extreme importance concerning the question under study. For the truths and principles stressed in the case of the artificial thing are applicable, in every respect, to the generation of the natural substance. Thus the natural thing, like the product of art, has three causes above and beyond the matter; and the most important of these other causes is, as in the case of the artificial thing, the final cause. Like the craftsman, the natural agent acts for an end. The conclusion to be drawn from this fact relates immediately to the problem in hand: the relation between the matter and the end in the natural thing is identical to that found in the artifact. That is to say, the material cause is chosen and disposed by nature precisely in order that it might sustain the form it is nature's intention to bring into existence, and in order that it might allow for the development and functioning of the organs which are essential for the survival of the natural substance.

Also, just as it is with the house, so it is in all things in which we find action for the sake of something; because in all these the dispositions in the things made or generated do not follow without the material principles which have the required matter by which they are innately apt to be so disposed. Still, the things generated or made are not so disposed because the material principles are such as they are, except insofar as the "because of" means the material cause; rather, they are so disposed

because of some end, and the material principles are sought which are apt for this disposition which the end requires. (3)

We see, then, that the relation between the material cause and the term of natural generation is the contrary of that assumed in the philosophy of materialism. The end is not the pure and necessary result of the matter; rather, the end is actually the cause of the matter. For the matter exists as a material cause of the natural thing, and is such as it is, because of the end to which it is ordered. In seeking the reasons for the material dispositions in natural things, therefore, their use or end must be accounted their first cause. The eye, for example, does not exist because of its material constituents (unless, as St. Thomas notes, we are referring to the material cause as such); it exists for the sake of the faculty of sight, and its material constituents are chosen precisely in order that the eye might be an instrument of sight.

A clear knowledge of the relation between the material structure and the end in the works of nature is shown by the contemporary biologist R.S. Lillie. In an article entitled "Some Aspects of Theoretical Biology", he calls attention to the principle that "directiveness implies a selective and preferential...distribution of physical influence in space and time". He then notes that "directiveness" (or purposeful action) and this consequent preferential distribution of physical influence are found in nature: "In the living

organisms material and energy move in certain predetermined directions rather than in others; they follow definite routes, i.e., are canalized". In illustration of this truth he cites the complex transmission system found in living beings, whose function it is to effect the desired distribution of material and physical influences: "Processes of excitation and inhibition, material supplies, mechanical and other forms of energy, all reach their destinations or points of application through nerve tracts, vessels, ducts, tendons, and similar fixed transmitting structures." (4) The mechanistic explanation of the processes of excitation, the distribution of nutriment, etc., would be that they were simply entailed by the structure of the various networks mentioned by Lillie. But the absurdity of such an analysis is revealed when it is considered that the networks were developed because of these processes, which, in turn, exist because of the end to which they are ordered. While there is indeed a determinate relation proceeding from the prior to the posterior in these instances, the dominant relation is that proceeding from the posterior to the prior, for the end is the first cause.

Now, as we have pointed out, it is the purposeful and ordered utilization of the matter by nature which reveals the error of the materialists. It cannot be held that the material principles properly account for the structure and function of the natural being when, in fact, these principles are employed by nature so that such things might come to be. In addition, this relation between the material cause and the end - denied in principle by the materialists - permits us to

determine the kind of necessity actually found in the generation of natural things. In manifesting this mode of necessity, St. Thomas again has recourse to an illustration drawn from art. The particular example chosen is that of a saw. As is apparent in the case of an instrument such as this, that its existence is not absolutely necessary. Indeed, its existence is wholly contingent upon the intention of the artisan, whose efforts to produce it, in turn, may be impeded by any number of factors. Does this mean, however, that no mode of necessity is found in its production? By no means - for, if the saw is to come to be and perform the work to which it is ordered, it must be made of a certain material.

Because the saw is such, i.e., is of such disposition or form, therefore it should be of such, i.e., it should have such matter; and it is such, i.e., it is of such disposition or form because of this, i.e., because of some end. However, this end, which is sawing, could not come about unless it were made of iron; therefore it is necessary that the saw be made of iron if it is going to be a saw and if its work is going to be its end. (5)

There is, then, a certain mode of necessity in the productions of art. But it is, as we see, a necessity which derives from a cause posterior in existence - the end. Thus it is only a conditional necessity. If a certain end is to be achieved, that which is presupposed to its existence must be; it is necessary on the supposition that the end is to exist. But it is the matter which is presupposed to the existence of the end; therefore it is the matter which must exist if the end is to be.

St. Thomas immediately applies the mode of necessity found in the productions of art to nature. The reason for this is that the material cause of natural things is also for the sake of the end. Such being the case, the nature of the matter is determined by the nature of the end. And so, the necessity in natural things is also from the end; it, too, is a conditional necessity. Another way of expressing the same truth would be to say that the necessity proper to nature is in the matter; for it is the matter which must be if the end is to be. This, it is to be noted, is the very opposite of the mode of necessity posited by the materialists, which is held to be from the matter and in the end.

It is evident, therefore, that in natural things there is necessity from supposition, just as in artificial things. But this is not in such a way that what is necessary is as the end, because that which is necessary is posited on the part of the matter, while the reason for the necessity is posited on the part of the end; because we do not say that there must be such an end because the matter is such, rather the opposite: because such an end and form is going to exist, it is necessary that such matter exist. The necessity is posited in the matter, while the reason for the necessity is posited in the end. (6)

It is clear, therefore, that, rather than necessitating the end, the matter is itself necessitated by the end. Neither the matter nor the end must exist of necessity in the absolute sense of this word; but if the end is to be, the matter must first be, and must be of a particular nature. The principle of the necessity in

nature is, as St. Thomas affirms, the form or end that nature seeks to bring into being. Because this form or end is of such a character, its existence necessarily involves certain material principles: these principles must exist upon the supposition that the end or form is to exist. In treating of the nature of the matter and of the reason for its existence, therefore, the end must be first in consideration. This truth is stressed by Aristotle in his treatise on the method proper to the natural sciences in De Partibus Animalium. The particular point being made relates to the development of certain essential parts of the human being, but since these parts, in turn, demand a determinate material make-up, what he says also applies to the matter.

The fittest mode, then, of treatment is to say, a man has such and such parts, because the conception of a man includes their presence, and because they are necessary conditions of his existence, or, if we cannot quite say this, which would be the best of all, than the next thing to it, namely, that it is either quite impossible for him to exist without them, or, at any rate, that it is better for him that they should be there; and their existence involves the existence of other antecedents. Thus we should say, because man is an animal with such and such characters, therefore is the process of his development necessarily such as it is; and therefore is it accomplished in such and such an order, this part being formed first, that next, and so on in succession; and after a like fashion should we explain the evolution of all other works of nature. (7)

The above notion is also developed by R.S. Lille in the article by him from which we previously quoted. It will be remembered that he called attention to the fact that a purposeful utilization and distribution of material factors was characteristics of living

things. And this, he pointed out, was accomplished by means of various systems of transmission. He then continues, emphasizing that such systems are necessitated by the particular requirements of the living organism. The comparison he makes is with human means of communication and transport, which are necessary to sustain the social organizations built up by man:

Such channelling is a necessary feature of organization if any highly diversified and active system is to be built up and enabled to preserve its stability in the finished state; in human society roads, canals, piping, telephone lines and other fixed routes of communication and transport offer close analogies; all these are products of conscious activity. (8)

Thus, having seen that these physiological systems are for the sake of an end, Lillie is immediately led to view this end as the principle of their necessity. For these transmitting devices must be present if the living being is to develop and continue in existence. And the corollary of the conditional status of the means adopted by nature in order to maintain the complex organization in the living being is that the materials utilized in the development of these structures are also conditionally necessary: such materials are necessary if the nerve tracts, ducts, tendons, etc., are to exist.

In the text from De Partibus Animalium cited above, Aristotle stated that it was the nature of man which necessitated the existence of certain of his parts. As he wrote, such parts exist "because the

conception of man includes their presence..." Much the same idea is presented in Book II of the Physics, where necessity in nature is compared to that found in demonstration. The basis for this comparison lies in the fact that, in both cases, the principle of necessity is the definition - of that which is in demonstration, of that which is to be in nature. On this question, St. Thomas writes:

It is clear that the principle of demonstration in the demonstrative sciences is the definitions. Similarly, the end, which is the principle and reason of necessity in those things which come to be according to nature, is a principle taken from the reason and the definition, because the end of generation is the form of the species, which the definition signifies. This is also evident in artificial things, because just as the one demonstrating takes the definition as principle, so also the one building and the doctor in healing. For example, because the definition of a house is such, this should come to be and exist in order that the house come to be, and because this is the definition of health, this should be done in order that one might be healed. (9)

This identity between the principle of demonstration and the principle of necessity in those things which come about for the sake of an end is particularly evident in the case of an artificial thing, such as a house. Let us first consider the definition of a house as a principle of demonstration.

There are two possible definitions of a house - one taken from the material cause and the other taken from the final cause. The definition of the house in terms of its matter would be: a house

be a structure that protects man from rain, cold and heat. Now, it is possible to demonstrate the definition in terms of the matter by employing the definition from the final cause as the principle of the syllogism. Thus we could say: a house is a structure that protects man from the elements; but that which so protects man is a structure composed of stones, cement and wood; therefore a house is a structure composed of such materials. In the light of this demonstration, we see that the complete definition of a house would be one which includes both the principle and conclusion of the demonstration. This would be: a house is a structure composed of stones, cement and wood which protects man from the elements. And if we wished to form a definition which would denote the causality of the end with respect to the matter, we would say: a house is a structure composed of such and such materials because it is a structure which protects man from the elements. Definitions such as these differ from demonstrations only in position, i.e., they are not ordered into mood and figure. This is the case because they contain all that is found in the demonstration, namely, the medium and the conclusion. (10)

Turning to the question with which we are immediately concerned, we find that the definition of the house from its end is also the principle of necessity. For, it is because a house is a structure which protects man from the elements that it is necessarily

constructed from stones, cement and wood. Put in a conditional form, this relation between the matter and the end would read: if that which protects man from the elements is to exist, it is necessary that it be made of stones, etc. As we see from this example, those things which come to be for, and are necessitated by, the end are like the conclusion of a demonstration. And the reason for this is that the end occupies the same place in generation that the principle does in demonstration.

St. Thomas next points out that, since the end of generation is like the principle of a demonstration and those things that exist for the end are like the conclusion, in the complete definition of the natural thing we also find that which is necessary because of the end. In illustrating this, he again offers the example of a saw, in whose definition we should place the matter as well as the end. For:

if anyone wanted to define the work of a saw, since this is cutting of a kind which will not take place unless the saw has teeth, and these will not be apt for cutting unless they are of iron, it will be necessary to posit iron in the definition of a saw. (12)

Accordingly, the complete definition of the natural thing will include the matter as well as the form or end, for it is the matter which is necessary because of the end. (13) This inclusion of the matter permits one final comparison between demonstration and natural generation. Thus far we have seen that the end of generation is like the principle of a demonstration; that the matter of natural things is like the conclusion of a demonstration; and that the complete definition of the

natural thing must include both the end and that which is necessary because of the end, just as the definition from the end in demonstration implies the definition in terms of the matter. St. Thomas writes of this final point of comparison between demonstration and natural generation:

Therefore, just as the definition which brings together in itself the principle and the conclusion of demonstration is the whole demonstration, so the definition which brings together the end, the form and the matter comprehends the whole process of natural generation. (14)

We have here reached the proof that nature's operations reveal a conditional necessity - a necessity from the end and in the matter. As we have seen, the commanding question is always: is the term of nature's operation intended? An affirmative reply to this query means that one must accept the end itself as the reason for the existence and necessity of that which is required for the existence of the end. However, in spite of this truth, a difficulty does present itself: one which was implicit in our treatment of necessity in Chapter One. There, in exposing the notion of necessity from the matter, we mentioned two phenomena which involved both this type of necessity and a final cause. The events in question were a faculty peculiar to serpents and the development of the spurs and talons of birds. Though both must be accepted as products of intention - for they clearly subserve desirable ends - Aristotle noted that they were

also necessary consequences of the given material conditions. Now, events such as these are not rare. Indeed, as Aristotle states in his introduction on method in De Partibus Animalium, the activities of nature can be expected to provide both this kind of absolute necessity and a necessity which derives from the end. And, he notes, the proper approach to natural processes must take account of the two:

Of the method itself the following is an example. In dealing with respiration we must show that it takes place for such or such a final object; and we must also show that this and that part of the process is necessitated by this or that stage of it. By necessity we shall sometimes mean hypothetical necessity, the necessity, that is, that the required antecedents shall be there, if the final end is to be reached, and sometimes absolute necessity, such necessity as that which connects substances and their inherent properties and characters. For the alternate discharge and re-entrance of heat and the inflow of air are necessary if we are to live. Here we have at once a necessity in the former of the two senses. But the alternation of heat and refrigeration produces of necessity an alternate admission and discharge of the outer air, and this is necessity of the second kind. (15)

Another example of such a union of necessity from the matter and intention is found in the sequences of events leading to rain. It will be recalled that the sort of causality revealed in this particular instance was offered as representative of the materialistic view of natural processes. However, in disputing the use to which the ancients put this phenomenon, St. Thomas does acknowledge that rain involves a necessity from the matter. The only error of which he accuses the ancients is their conclusion that such a necessity entails the negation

of the final cause:

For though the rain has a necessary cause of the part of the matter, still it is ordered to an end, namely, to the conservation of generable and corruptible things, because there is mutual generation and corruption in these inferior things in order that perpetual existence might be preserved in them. (16)

We find the same admission in De Generatione Animalium.

There Aristotle concedes that certain aspects of natural generation involve an absolute necessity as well as the causality of the end. And, like St. Thomas in the above text, his criticism of the ancients (in this case, Democritus) rests solely upon their denial of the final cause.

Democritus, however, neglecting the final cause, reduces to necessity all the operations of Nature. Now they are necessary, it is true, but yet they are for a final cause and for the sake of what is best in each case. Thus nothing prevents the teeth from being formed and being shed in this way; but it is not on account of these causes but on account of the end (or final cause); these are causes only in the sense of being the moving and efficient instruments and the material. (17)

These texts would appear to contradict the thesis which has been developed in the present chapter - namely, that where there is a final cause, the principle of necessity is the end rather than the matter. For it is clear that nature does, in fact, provide instances of a necessity from the matter. Should we, therefore hold the materialist position on the generation of natural things to be vindicated,

and that of Aristotle and St. Thomas to be invalidated? That such a conclusion would be entirely unwarranted will be evident from the following considerations.

As regards the possible vindication of the materialist conception of natural generation, there are two points worthy of note. First of all, this conception rests, not only on the presence of one kind of absolute necessity in nature's operations, but, as well, on the negation of all but the material cause. But, as we know, the coming-to-be of the natural thing involves three causes other than the matter, the first of these being the end. Consequently, while accepting a necessitation of certain things by the matter, both Aristotle and St. Thomas repudiate the ancients' position as a whole. For, as they immediately point out, the events which come about of necessity also have a final cause. Thus, in the passage from De Generatione Animalium in which he rejects Democritus' account of the formation of the teeth, Aristotle continues.

...to say that necessity is the only cause is much as if we should think that the water has been drawn off from the dropsical patient on account of the lancet, not on account of health, for the sake of which the lancet made the incision. (18)

Secondly, it should be noted that the kind of necessity upon which the materialists base their position is obvious and, indeed, trivial in character. As Aristotle remarks in De Generatione Et Corruptione, this sort of necessity is also encountered in artistic

productions. It is, he notes, simply something conjoined to the utilization of certain instruments in the realization of a desired end:

Moreover their procedure is virtually the same as if one were to treat the saw (and the various instruments of carpentry) as the cause of the things that come to be: for the wood must be divided if a man saws, must become smooth if he planes, and so on with the remaining tools. (19)

What now of the possibility that the existence of a necessity from the matter in certain events should invalidate the position that a conditional necessity is proper to nature? With respect to such a possibility, the above selection from De Generatione et Corruptione provides the most adequate rejoinder. As Aristotle there indicates, in the case of those things which come to be for the sake of an end, we can only say that, if such and such a cause is actually operative certain effects must follow. But, we may ask, is this cause itself - either the agent, its instrument or the matter - necessarily operative? To this we can only reply that it must be if the desired end is to be. But such a reply clearly shows that the ultimate necessity is one that derives from the end - in other words, a conditional rather than an absolute necessity. Therefore, while acknowledging that the matter is at times a necessary cause, neither Aristotle nor St. Thomas relinquishes the basic position. When the material principles and their effects exist for the sake of the end, even though an event have a necessary cause on the part of the matter, the matter is itself the subject of a necessity from the end. Now, the end is the first cause; and so, the primary, the dominant, necessity in nature is that which comes from the end.

CHAPTER SEVEN

ACCIDENS INDIVIDUI

The term of natural generation is intended. For this reason the materialist thesis concerning necessity in nature is altogether erroneous. It cannot be asserted that the end is simply the necessary result of the material cause when, in truth, the matter exists for the sake of the end. As St. Thomas stated in the Physics: the end is not such because the matter is such, but rather, the matter is such because the end is such. We cannot, for example, say that the organization of the parts of the animal body has as its proper cause the material principles composing these parts; rather, we must accept as the primary cause of this the nature of the living animal, which necessitates such a distribution of its material parts. For the animal nature is the final cause of the operations which brought the order of the parts into existence. Nor can we hold that, say, the flexibility of the human hand has as its first cause the material structure permitting such flexibility. For it is the operation made possible by this flexibility which is the cause of the material structure itself. In both instances, our assertions are consequent upon the principle that the matter is for the end. And, as was shown at the end of the preceding chapter, this relation between the material and final cause holds even when the matter necessitates certain intended effects.

But how universal in application is the principle that the nature of the matter is determined by the nature of the end? Can it be affirmed, always and without qualification, that the matter and its dispositions are what they are because of some end? In other words, do all the conditions of the matter, under all aspects, and thus all physical character characteristics of the natural substance, have a final cause? That the matter of the natural things, as to its general nature at least, will be what it is because of the end, is necessarily true. What, however, is to preclude the possibility that the matter, chosen and disposed for an end, entail certain characteristics that are either beyond or contrary to the intention of nature? Why should it not be possible that the material principles, when composing, say, the body of a living being, necessitate properties inimical to this being? What we are here suggesting is that there is no a priori reason for assuming that the material cause is always perfectly ordered to the form of the natural thing, and thus entirely tractable to the intention of nature. Can there, indeed, be any assurance that the matter will not, as it were, refuse to yield itself wholly to nature's designs?

As we shall have occasion to see in the present section of this work, the material cause does, in fact, play a dual role in the productions of nature. In one, its existence and nature are completely determined by the nature of the form it is to sustain; in the other, the matter is the dominant factor, and is the proper reason for many

unintended attributes, both essential and accidental, objectionable and harmless, found in the things which it composes. We shall also learn that, in nature as a whole, the purely physical factors present a strong obstacle to the fulfillment of nature's intentions. But let us first consider the unintended characteristics of natural things which spring from the matter alone.

There are two general classes of attributes which are simply necessitated by the material principles of things. In one of these we find the accidents that are peculiar to the individuals of any given species - such qualities as the color of the hair or eyes. As is apparent, here the causality of the matter, though exercised apart from that of the end, is usually innocuous in character. In the second class fall those attributes that are both common to all the members of the species and wholly adverse to the intention of nature. These are the many physical defects, including corruptibility, to which all living things fall victim. There is, however, a fundamental similarity between the two classes which permits us to describe them both as "Accidents individuali". We shall establish this similarity in what is to follow, but first we must treat of those accidents which vary from individual to individual.

It is in Book V of De Generatione Animalium that we find the accidents peculiar to the individual considered by Aristotle. His

purpose therein is not to analyze them as such, but to treat of the qualities of the parts of animals in general. However, in pursuit of this end, he is immediately led to distinguish between two kinds of such qualities - one of these being characteristic of a species as a whole, the other pertaining to the individuals within the species. He writes:

We must now investigate the qualities by which the parts of animals differ. I mean such qualities of the parts as blueness and blackness in the eyes, height and depth of pitch in the voice, and differences in color whether of the skin or of hair and feathers. Some such qualities are found to characterize the whole of a kind of animals sometimes, while in other kinds they occur at random, as is especially the case in man. (1)

In correspondence with this difference between the types of the above qualities, it is necessary to distinguish on the basis of their causes. Those qualities which are common to a species must be supposed to have a final as well as a prior cause. This is so simply because they do come to be always or for the most part. On the other hand, those affections which occur at random cannot be supposed to have a final cause, since their coming-to-be is not at all determinate. And because they do not come to be for the sake of an end, their only causes can be the matter and the agent. Further, since they lack a final cause, we must hold that they simply come to be of necessity in the absolute sense of this term.

Now we must no longer suppose that the cause of these and all such phenomena is the same. For whenever things are not the product of nature working upon the animal kingdom as a whole, nor yet characteristic of each separate kind, then none of these is such as it is or is so developed for any final cause. The eye for instance exists for a final cause, but it is not blue for a final cause unless this condition be characteristic of the kind of animal. In fact in some cases this condition has no connection with the essence of the animals being, but we must refer the causes to the material and the motive principle or efficient cause, on the view that these things came into being by necessity. (2)

As we see, Aristotle attributes such purely accidental qualities to both the agent and the matter. This does not mean, however, that he considers both of these causes to be of equal standing. For, actually, only the matter is the proper cause of these qualities. The reason for this lies in the negation of the final cause. Though the natural agent does indeed produce such qualities, it does so without intending them; they fall outside the notion of that which it intends to produce. They are thus incidental to the exercise of the natural agent's causality; i.e., they are merely concomitant results of this agent's action; so far as the agent is concerned, they simply "happen". The only determinate reason why they come to be is the condition of the particular matter utilized by the agent in the realization of its actual end.

It might seem that in calling attention to the fortuitous status of such characteristics, we are rendering contradictory the

affirmation that they come to be of necessity; for, certainly, the necessary and the fortuitous would seem to be opposed. However, we can, in instances such as these, hold to both chance and necessity. Chance is affirmed because the qualities in question do not enter into the conception of the end sought by nature; they are, as we noted above, merely coincidental results of the action of the efficient cause. On the other hand, necessity is affirmed because, given any individual and its unique material nature, this uniqueness must find expression in certain accidents: the bare existence of the individual necessitates the "accidens individui".

We thus find that nature's usual procedure - in which the end is dominant, and in which the matter comes to be and is such as it is because of the end - is subject to definite limitations. In the case of those things regarding which nature shows a clear determination, we can say that they become such because they are such, i.e., that their actual existence is the primary cause of their coming-to-be. (3) However, the reverse is true in the case of those things which occur at random: they are such merely because they become such; i.e., they simply "happen". Considering the determinate characteristics of things in relation to their material cause, we should say: "materia est talis quia finis est talis." But with regard to those characteristics of which the matter is the proper cause, we should say: "finis est talis quia materia est talis."

Let us now treat of the second class of attributes which arise "ex necessitate materiae". These are the characteristics that are both common to all the individuals within a species and altogether adverse to the intention of the natural agent. As both common to the species and contrary to the end, such properties point to a fundamental disproportion between the material cause of things and their form. In these instances we find that the matter, ordered to, and, indeed, necessitated by, the form and its operations, in turn necessitates characteristics wholly detrimental to the form.

The most comprehensive analysis of this disproportion between the matter and the form is found in Quaestiones Disputatae De Malo. The article in point is entitled "Whether Death and Similar Defects Are Natural to Man." The question is apparently posed in this manner because what is natural would seem to be intended - for the natural is that which follows from nature, and, as we know, nature acts for an end. Thus the first objection runs: "The body of man is composed of contraries. But everything composed of contraries is naturally corruptible. Therefore man is naturally mortal, and consequently naturally subject to other defects." (4)

In the body of the article, St. Thomas first admits the seeming validity of such an objection. He notes that something is termed natural either because it has a nature, as we call bodies natural, or because it is consequent upon the nature of the thing,

as we call the upward movement of fire natural. It is with this second meaning of "natural" that we are here concerned. Now nature is spoken of in two ways, namely, as form and as matter. Accordingly, that which is called natural as consequent upon nature is so called either because it follows from the form or because it follows from the matter. Thus we say that to heat is natural to fire because this action follows from the form of fire. And we say that to be capable of being heated by fire is natural to water because this follows from its matter. Since, however, the form is more nature than the matter (this is proved in Book II of the Physics), that which is natural as following from the form is more natural than that which is such as following from the matter. (5)

We thus see that corruptibility, which follows from the matter, would be less natural to man than, for example, the act of knowing, which follows from his form. On this basis, however, it would still seem that man's corruptibility is entirely natural. But there is yet another distinction to be drawn. We must consider that which is natural as following from the matter in a twofold manner. In one way, insofar as it is in harmony with the form. It is this property or condition consequent upon the matter that is sought by the agent; and it is because of such a property that the matter is chosen as the material cause of whatever is generated, whether it be natural or artistic. An example is that of the iron of the saw. The iron is

chosen by the artisan for its suitability to the form and to the end of the saw; this suitability derives from the iron's quality of hardness.

However, not all that follows from the matter reveals such congruence to the form. For there are also properties of the matter in accordance with which the matter is not proportionate to the form, but, instead, opposed to both the form and the end. The iron, for example, not only renders the saw capable of cutting by virtue of its hardness, but also renders it breakable and subject to rust. It is evident that such dispositions in the matter are not sought by the artisan; indeed, these defects are contrary to his intention. Yet they must exist. To what, then, are we to attribute them? Clearly, only to a necessity from the matter. In the one case - the saw's hardness - we have two causes, the end and the matter. In the other case - the saw's susceptibility to rust and breakage - we have only the material cause. Here, the matter is not necessarily such because the saw is such, but the saw, under this one aspect, is determined in its nature by the matter. Accordingly, as St. Thomas notes, the qualities of the matter which are contrary to the intention of the agent simply arise: "ex necessitate materie". (6)

The body of man presents a situation analogous to that encountered in the case of the saw. First of all, man's body must be considered insofar as it is ordered to man's form, the intellectual soul. Thus considered, it will be seen that it is necessary that it be composed of

contraries, evenly combined:

For since the human soul knows potentially only, it is united to the body in order that, by means of the senses, it might receive intelligible species, through which it knows actually. For the union of the soul to the body is not for the sake of the body, but for the sake of the soul; because the form is not for the matter, but the matter for the form. However, the first sense is that of touch, which in a certain way is the foundation of the others. Now, the organ of touch must be a mean between contraries, as is proved in Book II of De Anima. Therefore the body proportioned to the soul is one that is composed of contraries. (7)

Here, then, the body of man is of such a nature, and possesses certain characteristics, because of his form. However, just as in the case of the saw, the subject of the human form reveals a disordination with respect to this form. The material disposition that is ordered to the operation of man's intellect also entails the corruptibility of the human body and renders it susceptible to various other ills. In this respect, the human body is in no way proportionate to its form. Indeed, the corruption of anything is opposed to its form, since the form is the principle of existence, while corruption is the way to non-being. Hence, in De Caelo et Mundo, Aristotle states that the corruption of even a seed is contrary to its particular as determined by its form. But especially is corruption opposed to the form that is the intellectual soul. For, while other forms are corruptible at least per accidens, the intellectual soul is corruptible neither per se nor per accidens. (8)

Now since the corruptibility of man's body renders it disproportionate to its form, it is apparent that this characteristic is not

intended by nature. Indeed, if nature were so capable, it would seek a body which did not involve such undesirable traits. This, however, is impossible, for, as we have seen, the very material disposition which necessitates corruptibility is its conditionally necessary; it must be if man is to possess knowledge. There is, then, but one cause of corruptibility and similar defects - the matter. Such defects come to be "ex necessitate materiae". Far from being the object of nature's intention, they are simply necessary consequences of the given material conditions. (9)

We have mentioned the existence of organic defects other than corruptibility. One such defect derives from the bone structure of most animals. The outstanding function that the bones serve is a mechanical one; they form the skeletal support of the body. As well, they protect many vital organs and the chest cavities. And their structure is admirable suited to their supporting function. As a rule, there is no great expenditure of material, nor is the weight of the bones excessive. However, the very rigidity which enables them to perform their most essential function necessarily entails an undesirable consequence. This is their lack of "give" and their relative brittleness, which can lead to serious fractures. Under certain circumstances, a pronounced flexibility would be in order. But, of course, such a flexibility is impossible if the bones are to provide a skeletal support for the body. Hence, the condition in the matter which flows

"ex necessitate materiae", however repugnant it may be, must be accepted. Nature must acquiesce to the difficulties into which it has "engineered" itself.

Another example of a characteristic which arises from the necessity of matter is found in the case of the eye - more precisely, the lens of the eye. In order that the eye function as an instrument of sight, it is necessary that the lens be transparent. And that it is such is most certainly due to nature's purposeful action. However, this transparency also means that the lens is not opaque to certain harmful light rays. But the inability to repel harmful influences results necessarily from a material structure that is initially ordered to an end. Thus, if the desired end is to be realized, the consequent defect cannot be avoided.

There are many possible illustrations of severe limitations which result from the matter of natural things. But we may simply generalize and note that natural things are not indestructible. In the case of living things, even a relative indestructibility is out of the question: it would render impossible their vital functions. Leaving aside such particular instances, however, the important thing to grasp is that the matter manifests a fundamental duality of function. In the first instance, its causality is exercised on behalf of the form and the operations which follow from the form. Yet, in addition to this positive function, the matter entails consequences which run counter to

its first function, and which tend to negate the primary reason for its existence. The similarity between this second role of the matter and the materialist conception of natural phenomena is evident. The natural thing is corruptible, for example, not because of the intention of nature, but solely because of its given material structure. With regard to an attribute of this kind, the natural thing is such as it is because the matter is such as it is. And it is precisely this similarity between the assertions of the ancients concerning the universal dominance of the material principles in nature and the status of the undesirable characteristics of natural things, which leads St. Thomas to employ, in both instances, the expression "ex necessitate materiae".

However, there are certain important differences between the "necessity from the matter" posited by the materialists and that posited by St. Thomas - aside from the question of its universal extension, though related to it. As we have seen, the materialist position on all natural phenomena entailed a simple negation of the final cause and that which comes from the necessity of matter; for he defines "necessity from the matter" in terms of the end, referring to just that condition in the matter that is contrary to the end. Further, the attributes of the natural things which derive from the matter alone cannot be entirely separated from the matter's ordination to the end. For example, the corruptibility of the human body is intrinsically related to the disposition in the body which exists

for the sake of an end: man's acquisition of intelligible species. Thus, contrary to the position of the materialists, here the end is, in a sense, the cause of that which, in another sense, comes from the matter alone.

But this second fact presents a difficulty. For does not St. Thomas deny the causality of the end with respect to the undesired conditions in the matter? Yet that the end is a cause of such a condition is certain in the case of man, since from one and the same disposition in the matter arises both the possibility of knowledge and corruptibility. Accordingly, to attribute the human body's corruptibility to the material cause alone would seem to be impossible. We might also call attention to the fact that corruptibility is a property of animals; and as such, it would appear to be the result of intention. For does not Aristotle, in De Generatione Animalium restrict the phenomena which come to be from the necessity of matter to those which "are not the product of nature working upon the animal kingdom as a whole?" He further states: "...when we are dealing with definite and ordered products of nature, we must not say that each is of a certain because it becomes so, but rather that they become so and so because they are so and so, for the process of Becoming and development attends upon Being, and is for the sake of Being, not vice versa." (10) How, then, can we hold that corruptibility, which is found in all animals, and is thus an "ordered product" of nature, comes from the matter alone?

The solution to the above problem is found in the article from Questiones Disputatae De Hyle with which we began our discussion of corruptibility. There, in distinguishing between those characteristics in the body which are ordered to the form and those which are not, St. Thomas states: "Whence Aristotle says in De Animalibus that with regard to the accidens individui one should not seek the final cause but only the material cause, for the cause from the disposition in the matter, not from the intention of the agent." (11) In this reference to Aristotle, St. Thomas is clearly implying that all undesirable attributes - including corruptibility, which is proper to the species - are essentially the same as those qualities which are peculiar to the individual, and, for that reason wholly extrinsic to the intention of nature. But what permits him to take this position?

To understand his reasoning, we must again turn to the book of De Partibus Animalium in which Aristotle analyzes the accidens individui. There, as we saw, he stated that such accidents could not be considered to have a final cause since they occur at random. For their random occurrence means that the qualities in question do not enter into the conception of the goal of nature's operations. Thus the ultimate reason why we must hold that they do not come to be for the sake of an end is that they fall outside the notion of that which nature intends. It is because of this that they are only accidentally related to the fulfillment of nature's intention.

Let us now compare the individual accidents to the condition of corruptibility. The important question here concerns the desired goal of the natural agent, and its relation to what is actually brought into existence. In order to manifest the precise character of this relation, it would be well to draw upon an illustration from art. What, for example, of the craftsman in his construction of a saw? He surely knows that the saw he is to make will be the subject of many unwanted but necessary defects. However, if he were to define the desired term of his productive action, would any undesirable qualities be included in such a definition, necessary as they might be? Hardly - since to include in the definition of the desirable that which is undesirable would involve a simple contradiction. What, then, is the relation of such properties to the desired goal of the craftsman? Most certainly, the relation is a wholly accidental one. For, like the qualities which might occur at random, the undesirable characteristics do not enter into the notion of the intended end.

What has been said of the product of art also applies to the natural thing. Though corruptibility is necessarily, and so per se, related to the realization of the end, it is only accidentally related to that which the natural agent actually intends. In the case of animals, nature intends a knowing being; therefore, the definition of its intention will include only that which is determinative of its action. Factors extrinsic to this intention must be considered to be in the line of accidents.

This doctrine is presented more explicitly in Book II of De Anima. There St. Thomas very briefly considers the attributes of living things which come from the matter alone. He first notes that determinate material conditions are required by the functions of animals. He then adds:

But from this, that the parts have such dispositions, it follows that they have other accidents, such as a certain hairiness, or various colors, or corruptions. And these are not for the sake of an end, but rather come from the necessity of matter. (12)

We find here that all merely concomitant qualities of the living being are classified as "accidents" and attributed to the necessity of matter. No distinction is made between those qualities which are common to the species and those which follow from the individual matter as such. For the principle involved is identical in either case: all such qualities fall outside the conception of nature's goal, and are thus accidental to the intention of the end.

In the following chapter, this negative aspect of the material principles of nature will be developed further. In one respect, the particular question considered will be nearly identical to that which we have already discussed. There are, however, two important differences. One concerns the way in which the matter again reveals its opposition to the intentions of nature; the other, the particular form which this opposition takes.