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NATURA AGIT PROPTER FINEM

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PROPOSITIONES

1. a) Non omnis potestas sive accepta secundum eamdem rationem potentiae sive sub eadem specie, potest se habere ad opposita.

   b) Potentiae se habentes ad opposita sunt vel activae vel passivae; istae quae aequivocae potestates dicuntur, non se habent ad opposita.

   c) Possibile absolutum definitur ex non-repugnantia terminorum.

2. Voluntas magis participat modum naturae quam intellectus.

3. Eorum quae sunt a casu, causa est intrinseca, sicut eorum quae sunt a natura.

4. Justitia legalis est virtus maxime perfecta.

5. Modus procedendi in demonstrativis per prius est resolutorius.

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NATURA AGIT PROPTER FINEM

INTRODUCTION

In a brief yet stimulating article[1], Charles G. Bell has sketched the methodological trends in the experimental sciences for the past one hundred and fifty years. His survey brings out this: a mechanistic spirit prevails in the study of nature. Experimental scientists seem confident that a gradual dissolution of material agents into their material determining components will at length provide the solution to all the mysteries of nature. Mr. Bell notes: "... in every science and with every such new discovery of material determining agents, there will be a period of enthusiasm when real explanation and cause seem to be revealed. But after the discovered relationship has been examined for a time, it becomes apparent both that further unexplored relationships are required to connect these agents we have found with the operations they are supposed to effect, and that a new transcendental unity must be

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1) Charles G. Bell, Mechanistic Replacement of Purpose in Biology, in Review Philosophy of Science, Vol. 15, No 1, Jan. 1948.

postulated of the whole to bind the agents into the ordered pattern they maintain."(2)

The transcendental unity to be postulated is that of the final cause. And Bell shows in a cursory manner how in the last century and a half the progress of experimental sciences has been marked by a fascination for mechanism punctuated with periods of interest in finality. In effect the author has definitively shown that a sufficient explanation of nature can never be had without the introduction of final cause. Yet strangely and disappointingly he fails to make this his ultimate conclusion. Rather he concludes that both methods, the finalistic as well as the mechanistic, are of immense value, and both should be preserved and employed as has been done hitherto, one cycle alternating with another. It is true enough that both methods are valuable, and neither should be discarded. Still they should not be looked upon, or used, as unrelated principles; on the contrary, they ought to be integrated. The final cause has a definite relation to the efficient and the material causes of mechanism, for it is the "causa causarum" and determines the causality of the others. But without efficient and material causes, the final cause can never come into being. Once the priority of the final cause is

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2) Ibid., p. 47.

recognized together with the interdependence of all the species of causes, it becomes evident that only their proper integration can ever give us a complete explanation of nature.

It is therefore unfortunate that in modern times the significance of the final cause has been lost and an undue emphasis placed on material and efficient causes. But while this has certainly been the case in the experimental sciences, the blame is not entirely with the scientists. Much of the responsibility belongs to their philosophic brethren who have estranged, by false abstraction, the common principles of natural science. The history of modern philosophies is characterized by a denial, or at least, a neglect of final causality. Bacon, for example, acknowledges the division of causes into material, formal, efficient, and final, as quite proper, but dismisses the final cause as having a corruptive rather than a salutary influence on the progress of science.(3) Descartes expressly proscribes the search after final causes for the exami-

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3) "It is a correct position that 'true knowledge is knowledge by causes'. And causes are not improperly distributed into four kinds: the material, the formal, the efficient, and the final. But of these the final cause rather corrupts than advances the sciences, except such as have to do with human action." -- Francis Bacon, Novum Organum, in English Philosophers from Bacon to Mill, (Modern Library, N.Y., 1939) p. 88; also see p. 37.

nation of natural things.(4) Since Spinoza's claim is that all nature flows from the necessity of the Divine Nature and by it is determined to existence and action in a definite way, logically there can never be for him a question of finality, but solely of efficiency.(5) Leibniz decries the rejection of the final cause by his contemporaries, and, at the same time, attempts to conciliate the mechanists and finalists by holding up both methods as fruitful. Noble though his intentions may be, he nevertheless excludes in effect final causality as proper to nature since nature is for him always a necessary cause, and only extrinsically contingent upon the Free Will of God.(6)

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4) "That we must examine, not the final, but the efficient causes of created things.
"We will not stop to consider the ends which God proposed to himself in the creation of the world, and we will entirely reject from our philosophy the search of final causes." - Rene Descartes, Principles of Human Knowledge, The, (N.Y.: E.P. Dutton and Co. Inc., 1951) p. 197.

5) "In the nature of things nothing contingent is granted, but all things are determined by the necessity of divine nature for existing and for working in a certain way." - Baruch Spinoza, Ethics (N.Y.: E.P. Dutton and Co. Inc., 1910) Part I, Prop. 29, p. 23. See also Props. 32, 33.

6) Gottfried Leibniz, Discourse on Metaphysics (LaSalle, Ill.: Open Court Publishing Co., 1950) nos 19-20, pp. 33-39; and Textes Inédits (Paris: Presses Universitaires de France, 1948) 2 Vols., T. II, Conversation sur la Liberté et le Destin, pp. 478-486.

An even sadder commentary on the situation is had when it is noted that among Scholastic philosophers, who purportedly are carrying on in the tradition of Aristotle and St. Thomas, we find a misapprehension or gross neglect of the final cause in the study of nature. We will have occasion to see in the course of this work in what way Suarez denied final causality in natural activity; and a perusal of just a few of the numerous handbooks on Scholastic Philosophy will evidence how lightly the final cause is regarded. Even Gredt(7) who has authored one of the better textbooks has been negligent in this respect.

This brings us to the point where we may discuss our own purpose in the present endeavor. Hasty reflection on the title given this paper advises us that our present intention is to show that natural agents act purposively, and thus to discuss final causality in natural activity. We pretend to do nothing more than to put forth the views of Aristotle and St. Thomas on the problem, convinced that the thoughts of both men are as one. We address ourselves immediately and primarily to those in the scholastic tradition, with the hope that what we have to say may in some

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7) Gredt, Elem. Philosophiae (Friburgi Brisgoviae: Herder and Co., 1926) Vol. I, pp. 200-276, ed. quarta, where in discussing ens mobile in genere no mention is made of final cause.

small way help to bring about a re-examination of final causality among Scholastic thinkers. Beyond this our aim does not extend. There is perhaps a remote desire to see the notion of final cause re-instated in its proper place in the study of nature. But we believe this can be accomplished by proper study and treatment of the causes in Scholastic thought, which, when achieved, will have its repercussions in the body of philosophic endeavor.

The task we have set for ourselves then is an exposition of the Aristotelian doctrine that nature acts for an end. Such a treatment is susceptible of a division into two principal parts: first, we will try to establish that nature does in fact act for an end; secondly, we will attempt an explanation of how nature acts for an end, or again, how final causality in nature is to be understood.

The first part will embrace: a consideration of the terms 'nature' and 'end', so that a clear understanding of their precise application may be had; a discussion of chance and fortune, giving us an insight into our difficulties, as well as opening the road to their solution; and lastly, a detailed analysis of the five proofs presented by Aristotle to establish purposeful activity in nature.

Having in this way pointed out the fact of purposeful activity in nature, we will fix our attention, in

the second portion of this work, on the peculiar manner in which final causality is found in natural operations. We will do this by way of refuting the three principal objections to the finalist hypothesis. This will give rise to these major considerations: a discussion of the role of intelligence in final causations, and the way in which nature, though lacking intelligence, can still be properly said to act for an end; an investigation into the contingency proper to nature, which explains the chance event and not only renders possible but calls for purposive action in nature; and lastly, an examination of what is meant by the necessity of matter, showing that the necessity which matter exerts is actually borrowed from the end in view. With this our treatise will be completed, and I think that we will not only have satisfactorily demonstrated our thesis, but will also have successfully refuted all major objections.

Chapter One

EXPOSITION OF TERMS

Since the proposition "natura agit propter finem" is the focal point of our inquiry, it is well to preface our discussion with some explanation of what we mean by the terms "nature" and "end". It is no less fitting in such a treatment to impose certain limitations on ourselves, for, if we attempted to make a comprehensive study of these two terms at the outset, the whole perspective of this paper would be distorted. For one thing, as in every work of this kind, definite presuppositions have to be made, else we would find ourselves forced to explain every word or phrase used; for another, our notions of "nature" and "end" are destined to receive sharper precision in the development of our thesis, and we would only be clouding the issue by trying to grasp all their nuances from the beginning. Suffice it then for our purpose to give a general exposition of these two terms now.

We presuppose an understanding of the first book of the Physics[1] wherein Aristotle discusses the principles of the subject of Natural Science. That subject is

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1) Also, St. Thomas' commentary. Cf. In I Phys., lect. 1, nn. 2-4; In II Phys., lect. 1, n. 1.

ens naturale, or more formally, mobile being, the constitutive principles of which are matter and form. In Book II Aristotle views the method of demonstration and the mode of procedure proper to the study of nature, that is, the principles of Natural Science itself.(2) Such a proposal necessitates a twofold investigation: first, an inquiry into nature, for, only by knowing what nature is can we come to know what are natural things, and consequently what method is to be pursued in studying them; secondly, a determination of the causes the natural philosopher will use in his demonstrations. Among the causes discussed we will find that the end or final cause holds the pre-eminent position.(3)

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2) Cf. In II Metaph., lect. 5, n. 336 (ed. Marietti).

3) Though the most cogent demonstrations in natural science are taken from the end, nevertheless the demonstration most proper to the study of nature is that from the efficient cause. "Circa generationes et actiones, et circa omnem transmutationem maxime dicimur aliquid scire quando cognoscimus principium motus, et quod motus nihil est aliud quam actus mobilis a movente." -- In III Metaph., lect. 4, n. 382. The Metaphysician considers the final cause as proper to his science, and the efficient cause only in a reserved sense. "Et ideo ad hanc scientiam, inquantum est considerativa primarum substantiarum praecipue pertinet considerare causam finalem, et etiam aliqualiter causam moventem." -- Ibid., n. 384. In the light of the doctrine presented by St. Thomas in the Prima Pars, q. 108, a. 5, we can say Metaphysics studies the final cause as proper and proportioned to it, and the efficient cause per excessum, i.e. in a way above that called for by the nature of that cause; whereas Natura Science treats the efficient cause as proper, and the final cause per participationem et deficienter, in a manner below what is befitting that cause.

I - WHAT IS NATURE?

A. ITS DEFINITION -

The term "nature" has diverse meanings. We must now determine which of its senses pertains to our present consideration. Since it is the duty of the Metaphysician to delineate the various significations of words and the order of their imposition, let us consult Aristotle's treatment of the word "nature" in his Metaphysics.(4)

"Nature" is first used to denote the genesis of living things, and in this case it has the sense of the word "birth" or "nativitas" in Latin. Since all consequent meanings of a word are derived from its first imposition, it is important to grasp the full tenor of this primary signification of nature. The generation of living things, or birth, implies two distinctive notes: a kind of passage or motion, and an interiority. St. Thomas remarks that the very sound of the Latin and Greek words for nature themselves suggest a certain process; and he gives the example of the maturation of fruit or foliage, where the process from bud to full development is manifest to our senses.(5) Moreover, since what is born is at sometime internally conjoined

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4) Bk. V, ch. 4, 1014b16-1015a19; St. Thomas, lect. 5.

5) In V Metaph., lect. 5, nn. 811-815.

to that from which it issues, nature will always mean something intrinsic. The stem joining the leaf to the tree, the umbilical cord of mammals, exemplify this.

With this understanding of the primary meaning of nature, the transition to its consequent impositions is more easily made. From signifying the very genesis of living things, nature comes to denote the principle initiating that change, -- that from which the thing born is generated as from an intrinsic principle.(6)

The similarity of birth to other motions gives rise to the third meaning of nature as the intrinsic principle of movement, the source of motion in any natural being whatsoever when it is in the natural being as such.(7) This is what nature means in the second book of the Physics.

From the sense of nature as the intrinsic principle of motion in mobile beings, we easily progress to two further impositions. Matter is called "nature" because matter is in fact a principle of both the becoming and the

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6) "Ex hoc autem quod ipsa nativitas primo dicta est, secutus est modus secundus, ut scilicet generationis principium, ex quo aliquid generatur, sive ex quo illus, quod nascitur generatur primo, sicut ex intrinseco principio, dicatur natura." - Ibid., n. 809; Arist., 1014b18.

7) "... natura tertio modo dicatur id, unde est principium motus in quolibet entium secundum naturam, dummodo sit in eo inquantum huiusmodi." - Ibid., n. 810; Arist., 1014b20.

being of natural things.(8) For the like reason we call form "nature", and more fittingly so since the motion of natural things is due more to form than to matter.(9)

To these last two principal meanings of nature, are adjoined two others. The first relates to matter as nature, and is what we refer to as the raw material of a thing; as steel is the raw material of a saw.(10) The second is based on form as nature, and in this manner the species, which is the form of the whole, is called nature, e.g. humanity is the nature of man.

> Secundus modus adiacet quinto modo praedicto quo forma dicebatur natura. Et secundum hunc modum non solum forma partis dicitur natura, sed species ipsa est forma totius... Sicut autem forma vel materia dicebatur natura, quia est principium generationis, quae secundum primam nominis impositionem natura dicitur; ita species et substantia dicitur natura, quia est finis generationis. Nam generatio terminatur ad speciem generati, quae resultat ex unione formae et materiae. (11)

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8) "Ex hac autem tertia ratione naturae sequitur quarta. Si enim principium motus rerum naturalium natura dicitur, principium autem motus rerum naturalium quibusdam videbatur esse materia, consequens fuit ut materia natura diceretur, quae quidem est principium rei, et quantum ad fieri." - Ibid., n. 816; Arist., 1014b27-35.

9) "Quia vero motus rerum naturalium magis causatur ex forma quam ex materia, ideo supervenit quintus modus quo ipsa forma dicitur natura." - Ibid., n. 819; Arist. 1014b36-1015a9.

10) Ibid., n. 821.

11) Ibid., n. 822; Summa Theol., Ia, q. 29, a. 1, ad 4.

By a still further extension, which St. Thomas calls metaphorical, every individual substance may be named nature.(12) Since nature is the term of generation, and because generation terminates in substance, substance too receives the denomination nature, although metaphorically. And it is because substance is nature that Aristotle considered the various significations of Nature in the Metaphysics.(13) For there is a sense of nature that is co-exten-

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12) If we take motion in its wider acceptation as a perfect act, we can extend the term nature to include the intrinsic principle of operation of every being, and Angelic nature, Divine Nature, or human nature insofar as it is the principle of the specifically human acts of understanding and willing. In fact, there is a sense of nature inclusive of even accidental being, provided it can be reduced to something substantial: "Natura dicitur multipliciter. Quandoque enim dicitur principium intrinsecum in rebus mobilibus. Et talis natura est vel materia, vel forma materialis... Alio modo dicitur natura quaelibet substantia, vel etiam quodlibet ens. Et secundum hoc, illud dicitur esse naturale rei, quod convenit ei secundum suam substantiam. Ed hoc est quod per se inest rei. In omnibus autem, ea quae non per se insunt, reducuntur in aliquid quod per se inest, sicut in principium." - Ia IIae, q. 10, a. 1 (Underlining is mine). We may also employ "nature" to denote the whole universe, as when we say "something is in the nature of things", and further to signify "God" when we wish to express the idea that He is the author of nature, or the orderer of nature. Cf. John of St. Thomas (hereafter abbreviated to J.S.T.), Cursus Philosophicus, T. II (ed. Reiser), p. 171a.

13) "His distinguit hoc nomen Natura: cuius quidem consideratio, licet non videatur ad primum philosophum, sed magis ad naturalem pertinere, ideo tamen hic hoc nomen natura distinguitur, quia natura secundum sui quamdam acceptionem de omni substantia dicitur.... Et per consequens cadit in considerationem philosophi primi, sicut et substantia universalis." - In V Metaph., lect. 5, n. 808.

sive with substance, and therefore a subject of Metaphysics. We have covered them all, however, for a different reason, namely, to show where the third imposition, which properly concerns us, fits in the scale of the ordered significations of nature.

B. ANALYSIS OF DEFINITION -

As we noted, Aristotle uses nature as the intrinsic principle of motion in the second book of the Physics, and it has this meaning in the proposition "natura agit propter finem". Thus understood nature is defined as: the principle and cause of motion and rest in that in which it is primarily and in virtue of itself and not in virtue of an accident.(14) Let us go on now to make precise this notion of nature by an investigation of the elements of the definition.

The use of both "principle" and "cause" brings to light two things.(15) "Principle" re-emphasizes the interiority of nature, for a principle is that from which something proceeds. The terms together signify that those

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14) Phys. II, ch. 1, 192b21-23, -- taken from de Moerbeke's translation: "est igitur natura principium alicuius et causa movendi et quiescendi in quo est primum per se et non secundum accidens." Cf. also In II Phys., lect. 1, n. 5; In V Metaph., lect. 5, n. 810.

15) Cf. In II Phys., lect. 1, n. 5.

things are natural that have in them a principle of motion whereby they may move or be moved. Thus the principle of motion in a natural thing may be either active or passive. If the ens naturale can move, it has an active principle of motion; if it can be moved it has a passive principle of motion, which is matter. If it can both move and be moved (not under the same respect to be sure), it has both an active and a passive principle; and in each case nature is that principle.

It has been objected(16) that in some instances the principle of motion appears to be altogether extrinsic to the thing in movement, as, for example, in the heating of water. The principle of the heating seems to be, say, the sun, which is completely extrinsic to the water. Now, since this is a natural motion, Aristotle's definition appears to be faulty. St. Thomas dismisses this objection by stressing the role of nature as the passive principle in natural movements.(17) It is the passivity of matter, which has a natural appetite for form and movement, that is the principle of such motions, and in virtue of which they are natural. Thus water owing to its matter has a natural disposition to be heated, and when it is actually

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16) Cf. Ibid., n. 3.

17) Cf. Ibid., n. 4.

being heated by the external agency of the sun, we still say that nature is the principle of that motion, since it is through the passive potency of matter (nature) that the motion is possible.

This precision marks a great difference between naturalia and artificiata. While in the products of art there is a material principle, nevertheless, the matter is not intrinsically ordered to, i.e. has not a natural appetite for, the artificial form it receives. Nature connotes something intrinsic, and so to have a natural appetite for something, is to be intrinsically ordered to it. A bed and a tree limb are alike in having a material principle, but they differ in that the form of the limb is the result of the intrinsic appetite of the material principle in the tree, whereas the form of the wooden bed is not; rather it is something extrinsically impressed upon it by an intelligent agent. The bed, as the limb, can fall, not by reason of being a bed, but owing to its mass, which it has in virtue of what is its nature.(18)

The definition goes on to say that nature is a principle of both motion and rest. This means, if it is natural for a body to move or be moved, nature is the principle of the motion; if it is natural for a body to be at

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18) Cf. Ibid.

rest, nature is again the principle; and lastly, it is not necessary for the ratio naturae that a thing have a natural tendency both for movement and for rest.(19)

By "motion" is not understood simply locomotion, but any corporeal or physical motion; and "rest" does not signify a total lack of motion simply, but the term of a given movement. For nature is a real principle of repose, and if "rest" expressed a pure negation, nature would be a real principle of nothing, and hence would be nothing. It is the repose, which follows on the achievement of the term of a motion, of which nature is the principle.(20)

Aristotle employs the phrase "in that in which it is primarily" to state definitively that nature must be an intrinsic principle. Hence, anything that moves or is moved by an extrinsic principle is not natural. So, the artifact, whose principle of motion is an artificial form received extrinsically from the artist, as well as that which is moved by violence, which is some exterior force, are both excluded. The word "primo"(21) qualifies the

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19) Cf. Ibid., n. 5; also J.S.T., Curs. phil., p. 172a.

20) "Nomine vero 'quietis' non intelligitur pura carentia motus, sed carentia illius cum possessione termini. Huius enim quietis possessivae principium reale est natura, carentiae vero, quatenus est nihil, non datur principium reale." -- J.S.T., loc. cit.

21) "Dicit autem in quo est, ad differentiam artificialium in quibus non est motus nisi per accidens. Addit autem primum, quia natura, etsi sit principium motus com-

notion of intrinsic principle as root origin, so that when we say that nature is an intrinsic principle of motion, we mean that it is a radical principle, and therefore in the substantial order. But it is the radical or prime principle in the same genus as the motion; which is to say, that though the fall of an animal is a natural movement as following on the very nature of the animal, nevertheless, it is not from the nature of the animal as animal, or as living, but as heavy body. In other words, the motion of falling may in given circumstances be common to all bodies, not peculiar to the animal, and therefore its falling must be imputed to the nature of the animal, insofar as the animal has an intrinsic principle of the motion of its body qua body. But such a principle is not the only source of motion in the animal, for it has another, namely, the intrinsic principle of its movement of growth, and still another, its intrinsic principle of sensing. We are not implying that the animal has several natures, but that the one it has includes in an eminent way the natures of

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positorum, non tamen primo. Unde quod animal movetur deorsum, non est ex natura animalis in quantum est animal, sed ex natura dominantis elementi." -- In II Phys., lect. 1, n. 5. The phrase "ex natura dominantis elementi" indicates what we are shortly to point out, namely, that the "primum" of the definition refers principally to the intrinsic principle of the most fundamental movement in any natural being.

inferior beings.

Once more, nature is the first intrinsic principle in the substantial order and first in the line of motion of which it is the principle. Consequently, the falling motion of the animal is attributed to the nature of the animal as bodily substance; the movement of growth, to the nature of the animal as living material substance; and sensation, to the nature of the animal qua animal. The question arises as to which of these is absolutely first, or to which does the word "primarily" in the definition principally refer. Some(22), it seems, would say it is the last, namely, the nature of the animal qua animal. In a sense this is correct. For, the soul of the animal is its substantial form and the principle of all its motions, containing in a virtual, eminent way the perfections of the substantial forms or natures of all things below it in the scale of being.

However, it is also true that nature as body is the foundation of nature as living substance and of nature

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22) "... illa particula 'primum' denotat, quod principium debet esse intrinsecum radicale. Sed quia non satis explicatur, quid sit esse radicale principium, adhibetur illa particula 'per se'. Sic enim intelligimus, quod non solum est primum respectu operationis et motus, sed quod in ipsa essentia rei est primum tamquam per se illi conveniens." - J.S.T., op. cit., p. 173a. (Underlining mine.)

as animal substance. A plant is first a body before it is a living body, just as an animal is a bodily substance first, then living, then sensate.

> Oportet intelligere diversitatem formarum naturalium, secundum quas constituitur materia in diversis speciebus, ex hoc quod una addit perfectionem super aliam, ut puta quod una forma constituit in esse corporali tantum... Alia autem perfectior forma constituit materiam in esse corporali, et ulterius dat ei esse vitale. Et ulterius alia forma dat ei et esse corporale et esse vitale, et super hoc addit ei esse sensitivum. (23)

In addition, as we will see shortly, that is more natural which is more determined to one, for which reason inanimate things will be said to be more natural than animate beings. It follows from this that the intrinsic principle of a motion that animated substances have in common with inorganic beings ought more to be called nature than their intrinsic principle of growth, for instance. In fact, both Aristotle and St. Thomas divide the operations of the animal soul into animal and natural, naming those animal that are proper to the sensitive soul as such, and those natural which the animal has in common with inferior beings.(24)

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23) Q.D. de Anima, q. un, a. 9.

24) "Unde Philosophus dicit in II de Anima, quod anima est naturalis corporis; et propter hoc operationes animae distinguuntur in animales et naturales. Ut illae dicantur animales quae sunt ab anima secundum id quod est proprium sibi; naturales autem quae sunt ab anima secundum quod facit effectum inferiorum formarum naturalium." - Q.D. de Anima, q. un, a.9, ad 6.

Therefore, it seems more correct to say that the "primo" of the definition has principal reference to the most inferior nature in any given cosmic being, i.e. to the absolutely first intrinsic principle which is the source of a motion common to all bodies.(25)

Lastly, this intrinsic principle must be in that in which it is "in virtue of itself and not in virtue of an accident". Nature must be a substantial intrinsic principle, not an accidental one, so that if something has a principle of movement internal to it that is merely accidental, that principle is not nature. In the classic example of Aristotle(26), a Doctor may cure himself of an

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25) To confirm this interpretation, see In II de Anima, lect. 7, n. 310, where in giving the order of the potencies of the soul St. Thomas claims <u>first</u> place for the vegetative potencies because these are the <u>foundation</u> of all the others and <u>common</u> to all living beings: "Ideo primo dicendum est de obiecto et actu huiusmodi partis (i.e. vegetativae), quam aliarum: quia ista pars est prima inter alias partes animae is subiectis in quibus invenitur cum aliis: est enim quasi <u>fundamentum</u> aliarum, sicut esse naturale ad quod pertinet operationes eius, est fundamentum esse sensibilis et intelligibilis. Et alia ratio est, quare est <u>communis</u> omnibus viventibus." (Underlining mine.) For the like reason he says the generative potency is the most natural: "Et dicitur naturalissimum (i.e. generare), quia in hoc convenit etiam cum aliis rebus inanimatis, quae generationem habent, licet alio modo." -- Ibid., n. 312. For other instances of things being said to be more natural because more fundamental and more common, cf. In VIII Ethic., lect. 12, n. 1720-1725; IIa IIae, q. 26, a.8. See also, Cajetan, Commentaria in De Anima Aristotelis, nn. 140-149.

26) Cf. Phys., II, ch. 1, 192b23-32.

illness. Here, indeed, the causal principle of health is within the man himself, who happens to be a Doctor. The art of healing is an accidental quality that accrues to this sick man. Doctors heal the sick; the sick are healed by Doctors. In our example the sick man, who is also a Doctor, makes use of his acquired medicinal art to cure himself; but he is healed qua sick man, qua other than Doctor. But a natural principle of motion is in a natural body that is moved only insofar as it is moved. Whereas the art of healing (the causative principle of health), while intrinsic to the person healed, is nevertheless extrinsic and accidental to the movement of the sick man; for he is moved qua sick man. The connection between the Doctor who heals, and the sick man who is healed, is only an accidental one.

In this manner we can always distinguish natural from artificial things. The principle of the motion engendering natural things is within and per se proper to itself, whereas the principle of the production of artifacts is always extrinsic, either by the exteriority of separation, or by the exteriority of an accident.

> Et sicut est de medico sanante, ita est de omnibus artificialibus. Nullum enim eorum habit in seipso suae factionis principium; sed quaedam eorum fiunt ab extrinseco, ut domus et alia quae manu inciduntur; quaedam autem fiunt a principio intrinseco sed per accidens. (27)

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27) In II Phys., lect. 1, n. 5.

C. THE DEFINITION APPLIED -

1. General Application -

Having discussed the definition of nature, we next consider its extension, that is, to what things it is applied. First of all, it is clear that those things are natural that have in themselves a principle of motion and rest. Since matter is such a principle, matter is called nature. Further, since it is through the form that matter is, the form of the matter is also nature. Indeed the form may be said to be more nature than matter, since what is in act in regard to some perfection is more deserving the name of that perfection than that which is only in potency in it.(28)

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28) Cf. Ibid., n. 6, and lect. 2. This general application of the term "nature" takes into account the imposition of "nature" secundum ordinem rerum. See In V Metaph., lect. 5, nn. 824-826, where St. Thomas notes that Aristotle distinguishes between the order of predication of nature by reason of the imposition of the name, and the order of its predication by reason of the things signified by the name. We name things in the order in which they enter our knowledge. Afterwards we may reflect on the things themselves and see that one may merit the name more than another. Thus we impose the name anew, giving a different order of predication. "Sed secundum rerum ordinem, formae prius competit ratio naturae, quia... nihil dicitur habere naturam, nisi secundum quod habet formam." -- Ibid., n. 825. Next, "Materia... dicitur esse natura, quia est formae susceptibilis. Et generationes habent nomen naturae, quia sunt motus procedentes a forma, et iterum ad formas." -- Ibid., n. 826. In the particular application of nature to follow, we will see more determinately the basis of these two orders.

Those things will be said to be natural or "according to nature", whose substantial existence, as well as accidental existence, depends on an intrinsic principle of motion.(29) Yet, more determinately, we can see that all natural things will in fact be bodies, corporeal beings, for nature has been defined as the intrinsic principle of motion. But motion requires as a "conditio sine qua non" divisibility, and divisibility depends on quantity and ultimately on matter.(30) Hence, every ens naturale must have matter as a constituent principle, and so every being of nature will be a body. This is not to say that the formal aspect under which the study of nature considers its subject is that of corporeity. Natural bodies comprise only the material subjects or objects of the study of nature. The peculiar formality under which the Philosophy of Nature views its subjects is that of mobility, that is, it considers beings inasmuch as they have an innate aptitude for motion. The formal subject of the study of nature is then mobile being, or mobile ut sic, while in re every mobile being is a body.(31)

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29) Cf. Phys. II, ch. 1, 192b35-38.
30) Cf. Phys. VI, ch. 1; In VI Metaph., lect. 1, n. 1158; J.S.T., Curs. phil., p. 10b.
31) Cf. In VI Metaph., lect. 1, nn. 1155 and 1158; In XI Metaph., lect. 4, n. 2209; in I Phys., lect. 1, n. 4 (although here St. Thomas speaks strictly of the subject of the Physics only; nevertheless on view of the other citations, it can be used as a secondary reference.) J.S.T., op. cit., pp. 8-17.

2. Particular Application -

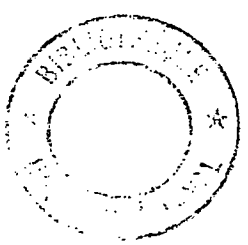
Something is said to be natural because it has nature, but can one thing be said to be more natural than another? For example, is an inanimate thing more deserving of the name "natural" than an animated being? If so, is it more deserving because the nature that it has realizes more properly the definition of nature? The answer to each of these questions is "yes". To understand why, we must reflect on the reason underlying the order of impositions of the term nature.

The common experience of the observer of cosmic events is that on which the Ancients based themselves in imposing the term nature. Things come into being around us. Further, there is a definite regularity in these diverse becomings, that is, definite things result from determinate prior things, e.g. an oak, not a maple tree, comes from an acorn; a human being, not a brute animal, results from human sperm. We wish now to characterize these events by imposing a name on them, so that some community of thought about them may be possible. Our minds are still in some confusion about what is essential to all these happenings, but what is certainly obvious to us is the coming-into-being of living things. We call it birth,

as did the Greeks and Latins, but their name for birth is a cognate of another term that we translate as "nature". Thus we have the first imposition of nature, and say that it (nature) is the genesis of living things.

Remaining in the genus of animated beings, which are more comprehensible to us, we inspect further the phenomena around us, and we remark that the genesis of living things involves a certain process or passage from something. Things born come to be born <u>from</u> <u>something</u>; and they do so after passing through definite stages during which they are internally conjoined to that from which they issue. This suggests to us that the causal root of cosmic becomings may be the principle whence begins the process that culminates in the birth of a living thing. So, we call the <u>principle</u> of the generation of living things "nature".

However, this second signification of nature cannot explain all the happenings around us, for there are other passages or motions similar to those of generation, and some of these are not attributed to living things. Yet these motions reveal a like interiority, and a result, just as regular, if not more so: the movement of the sun or that of falling bodies, for example. This leads us to impose the signification of nature as the principle and cause of motion and rest, etc. And as that principle may



be active or passive, form as the active principle, and matter as the passive, are called nature.

Looking back now, we can see that our search for a quidditative knowledge of what lies beneath the regularity of phenomena was actually an advance from confusion to distinction. We had at first a vague knowledge of what nature is, and to aid us in acquiring a distinct knowledge of it, we gave it a signal definition, based on something quite evident to us. From this as a terminus a quo we went to a second tentative definition, less obscure than the first, and thence to the proper definition of nature as the intrinsic principle of motion.

Once this exact definition of nature is had, we go on to see how it can be applied. As was observed, it applies to bodies first of all; but among these, some answer to the requirements of the definition more strictly than others. St. Thomas brought this out for us when he divided the operations of brutes into animal and natural, and he directs our attention to it again in a like distinction of plant activities.

> Omnia (vegetalia) enim in seipsis habent potentiam quamdam, et principium, quo suscipiunt motum augmenti et decrementi. Et quod hoc principius non sit natura sed anima, manifestum est. Nam natura non movet ad contraria loca: motus autem augmenti et decrementi est secundum contraria loca. Augentur enim vegetabilia omnia,

> non solum sursum et deorsum sed utroque modo. Manifestum est ergo, quod principium horum motuum non est natura, sed anima. (32)

Since every particular motion is always toward some determined thing, and since the entire concern of the ordered impositions of nature centered on an explanation of the regularity, constancy, hence determinacy, of cosmic events, the notion of determination ad unum was understood in the whole discussion. From this kind of seed, this determined kind of thing results. And the intrinsic principle of the movement, that is the genesis of this determined kind of thing, is what we call nature. Hence, the factor of determination ad unum is an essential element to be considered when judging how different bodies comply with the definition of nature. Because the movement of growing plants shows a certain indetermination inasmuch as it is ad contraria, that movement is said to be from the vegetative soul rather than from nature. Here St. Thomas is reserving the term nature for inanimate things, since in them we find complete determination to one. This does not mean that the growth of plants is not natural, for it is. It is natural to the plant because it proceeds from the soul which is the active intrinsic principle of

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32) In II de Anima, lect. 3, nn. 256, 257. (Underlining mine.)

movement in vegetalia.

The point is that there is an order in predicating "nature" of things according as those things comply with the proper definition. Inorganic beings are completely determined to one in their operations, and therefore nature will be said first of them. Indeed, as we indicated, Aristotle and St. Thomas often employ the term with exclusive reference to inanimate beings. Plants show a certain indetermination in their movements, and animals even more; so, nature will be said less strictly of them.(33)

Is this contrary to the first order we gave of the impositions of the term nature? Not if we bear in mind that that order represents a gradual effort in passing from a confused knowledge of nature to a distinct knowledge of it, for then the turnabout will be found to be merely apparent. Once a distinct knowledge of nature is attained, and its definition formulated, then do we look for its real order of imposition.

A final observation on this same problem is that in the Books of the Physics Aristotle is dealing with the communia, the common notions applicable to every ens mobile. In the succeeding treatises of his Natural Science, he takes

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33) This will become clearer in the fourth chapter after we have explained in what way natural beings are determined in their operations.

up the notions peculiar to the different kinds of mobile beings, whether inanimate, vegetal, or animal. For that reason he does not differentiate the inanimate being from the animated being with respect to the term "nature" until the De Anima. That distinction becomes necessary then because he is no longer speaking in communi, but in specie. Consequently, when Aristotle demonstrates that nature acts for an end in the second book, he is still speaking generally, and therefore employs the term nature for every principle and cause of motion and rest, etc., irrespective of whether this is found more properly in one agent than another. Thus, every being composed of matter and form, and every operation originating in these two principles, are called natural. This includes all the operations of man excepting those of his intellect and will, since these are not motions in the strict sense. Such is the sense of the words "nature" and "natural" in our thesis.

D. SELF-EVIDENCE OF NATURE -

We may conclude our consideration of the meaning of nature with a brief analysis of an objection made by Augustin Mansion to Aristotle's assertion that the existence of nature is evident and requires no demonstration. Mansion will admit that experience suffices to establish the exis-

tence of mobile beings, but he seriously doubts that it makes evident to us that nature is the principle of their movement.(34) What may be the node of Mansion's difficulty is a confusion between the knowledge of the existence of a thing, and the knowledge of its quiddity. St. Thomas has discussed this very problem, saying in effect that it is ridiculous to try to demonstrate the existence of nature, since it is sensibly evident that many things -- meaning those that have in themselves the principle of their movement -- exist by nature. Whoever wishes to demonstrate the evident by the obscure, cannot judge what is or is not known of itself; for, in attempting to demonstrate something that is known of itself, he is actually treating it as not self-

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34) "Dans un passage antérieur de la Physique, il avait posé en hypothèse contre les Eléates qu'il fallait, sous peine de détruire la physique en même temps que son objet, prendre comme point de départ que les êtres naturels étaient en mouvement, soit tous, soit quelques-uns au moins: il en appelait alors à l'expérience ou à l'induction. C'est là, en effet, une constatation qui s'impose: mais ici la thèse va plus loin et porte sur l'existence d'un principe en somme transcendant à l'expérience. Seulement l'inférence en vertu de laquelle on y arrive, est pour le sens commun si immédiate qu'Aristote a été amené à en faire une évidence. Il n'en reste pas moins que tout ce qu'il ajoutera, dans la suite, à sa théorie de la nature, participera à la faiblesse du début et, pour tout dire, n'aura, comme fondement dernier, que l'analyse fort succincte de l'expérience journalière et du langage ordinaire que nous avons résumée; or cette expérience, traduite dans le langage, implique une interprétation qui dépasse les faits." -- Augustin Mansion, Introduction à la Physique Aristotélicienne, 2e ed., Paris, Vrin, 1946, p. 101.

evident. The existence of nature is known of itself because natural things are evident to sense, although what the nature of each thing is, or what the very principle of motion is, is not so obvious. Still, ignorance of the proper nature of things does not prevent the existence of nature from being self-evident.(35)

It is possible to be certain of the existence of nature without knowing precisely what it is. Our external and internal experience distinguish some mobile beings, whose principle of movement is intrinsic, from others whose principle is extrinsic; in other words, it distinguishes natural things from artifacts. In manifesting the existence of beings in motion, and concomitantly the fact of motion, our experience discloses further the existence of an intrinsic principle of the motion -- the principle we call nature. But what exactly is nature is not so evident, a condition

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35) "Et dicit quod ridiculum est quod aliquis tentet demonstrare quod natura sit, cum manifestum sit secundum sensum quod multa sunt a natura, quae habent principium sui motus in se. Velle autem demonstrare manifestum per non manifestum, est hominis qui non potest iudicare quid est notum propter se, et quid non est notum propter se: quia dum vult demonstrare id quod est notum propter se, utitur eo quasi non propter se noto... Naturam autem esse, est per se notum, inquantum naturalia sunt manifesta sensui. Sed quid est uniuscuiusque rei natura, vel quod principium motus, hoc non est manifestum... Sed ignorantia principiorum moventium non impedit quin naturam esse sit per se notum." -- In II Phys., lect. n. 8.

that Aristotle and St. Thomas recognized and for that reason discussed nature in detail. It is only by reflecting on our experience that we can come to know what nature is. Our external experience differentiates natural from artificial things, and our internal experience presents us with an interiority, which we recognize as proper to natural things, having once compared them to artificiata.

With this we conclude our expesition of the term nature, saying with Aristotle: "What nature is, then, and the meaning of the terms 'by nature' and 'according to nature', has been stated. That nature exists it would be absurd to try to prove."(36)

II.- END OR FINAL CAUSE

Following his discussion of nature, Aristotle distinguishes the manner in which Mathematics and Natural Science consider their objects, then observes that the natural philosopher must treat of both matter and the forms inhering in matter, and thence proceeds to investigate the causes by which the natural philosopher demonstrates.(37)

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36) Phys., I, ch. 1, 193a1-3.
37) Cf. In II Phys., lect. 3, n. 1; lect. 4, n. 1; lect. 5, n. 1.

Salient among these causes is "that for sake of which", the end or final cause.

A. PLACE AMONG THE CAUSES -

By its very definition a cause must have an influence on the existence or becoming of the thing of which it is said to be the cause. "Causae autem dicuntur ex quibus aliqua dependent secundum suum esse vel fieri."(38) Now the caused existence of thing may be regarded from a twofold viewpoint. Absolutely and in itself, the form is the cause of the being of a thing, for it places the thing in act. Again, the caused '*esse*' may be looked at as reduced from potential being to actual being. This enables us to distinguish two other causes: first, matter which is 'ens in potentia' and that out of which the new being is made; secondly, the agent through whose efficient action potential being is reduced to actual being. Still, the agent ought to direct its action toward a determinate thing, since it is by reason of obtaining some determinate thing that the agent sets itself to act. This last, namely, that toward which the action of the agent tends, is called the end, or the final cause.(39)

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38) In I Phys., lect. 1, n. 5; see also In V Metaph., lect. 2 and 3; J.S.T., Curs. phil., p. 198.

The end enjoys a particular prestige among the causes. It is spoken of as the "causa causarum", for the causality of the other causes depends upon it.

> In aliis vero causis invenitur alia ratio causae, secundum scilicet quod finis vel bonum habet rationem causae. Et haec species causae potissima est inter alias causas: est enim causa finalis aliarum causarum causa. Manifestum est enim quod agens agit propter finem: et similiter ostensum est supra in artificialibus, quod formae ordinantur ad usum sicut ad finem, et materiae in formas sicut in finem, et pro tanto dicitur finis causa causarum... haec species causae habet rationem boni, et quandoque in his quae agunt per electionem contingit finem esse malum; ideo ad hanc dubitationem tollendam, dicit quod nihil differt utrum causa finalis sit vere bona vel apparens bona, quia quod apparet bonum non movet nisi sub ratione boni. (40)

This text gives us grounds for making two important observations. First, it is the end, or final cause, that determines the causality of the other causes. We can

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39) "... Cum causa sit ad quam sequitur esse alterius, esse eius quod habet causam, potest considerari dupliciter: uno modo absolute, et sic causa essendi est forma per quam aliquid est in actu; alio modo secundum quod de potentia ente fit actu ens. Et quia omne quod est in potentia reducitur ad actum per id quod est actu ens; ex hoc necesse est esse duas alias causas, scilicet materiam, et agentem qui reducit materiam de potentia in actum. Actio autem agentis ad aliquid determinatum tendit, sicut ab aliquo determinato principio procedit: nam omne agens agit quod est sibi conveniens; id autem ad quod tendit actio agentis, dicitur causa finalis." -- In II Phys., lect. 10, n. 15; cf. In V Metaph., lect. 2, nn. 771 and 775; lect. 3, nn. 781-782; J.S.T., op. cit., p. 201.

40) In II Phys., lect. 5, n. 11; cf. In V Metaph., lect, 2, n. 775; lect. 3, nn. 781-782.

illustrate this by imagining a modeler seated in his studio fingering a lump of clay. He wishes to fashion an egg out of it, and commences to roll the clay back and forth in his hands until the desired shape is had. Now, quite obviously the finished product, the egg-shaped piece of clay, is the end of the modeler's previous activity of rolling and kneading, and as such it terminates his action. Nevertheless it is in addition the initiating cause of the action. The artist before beginning his work sees a particular value in the artifact in question; that value is attractive enough to arouse his will to a desire of it. In consequence, his will moves his hands to efficient operation, ultimately bringing about an elliptic form in the clay.

We see it is actually the end, or final cause, that instigates the other causes to cause. Through his desire of the end the agent is moved to operate, to induce form into matter. And since it is this definite end which is desired, a certain kind of matter is necessary to attain it, and thus matter is able to exercise its causality. Lastly, either the form and end are identical, or form is utilized for the sake of the end. We understand further what is meant when it is said that the end is first in the order of intention and last in the order of execution.

It is the intention of the end that sets the other causes in motion, as a result of which the end comes into actual being.

B. DEFINITION - END AS GOOD -

The second capital note to be made from the above cited text is the identification of end and good, -- a consideration absolutely essential to a proper understanding of final cause.(41) The end is a cause only inasmuch as it is a good, for, as we will see later, the end causes through being desired by some appetite. Now, appetite is the inclination of a being toward the thing which it desires. But every inclination is toward something similar and suitable to the being that is inclined. This can only mean that every inclination must be toward something good, since what is suitable to something must be good for it. Therefore every appetite is for something good, and, since it is the end that inclines the appetite, end is essentially good.(42)

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41) See Charles Hollencamp, Causa Causarum, in review Laval Théologique et Philosophique, Vol. IV. The author shows well to what extreme errors Durandus, Suarez and Vasquez were led as a consequence of their failure to grasp the notion of the identity of end and good.

42) "Omnis autem appetitus non est nisi boni. Cuius ratio est quia appetitus nihil alius est quam inclina-

The good we speak of is of course, not the moral good, but the transcendental good, -- that good which is really identical with being but which implies in addition an ordo ad aliud, a relation that the word being never connotes. In the De Veritate St. Thomas brings to the fore this difference between ens and bonum, spelling out at the same time the precise ordo ad aliud the good implies.

> Secundum hoc aliqua dicuntur addere supra ens, in quantum exprumunt ipsius modum, qui nomine ipsius entis non exprimitur. Quod dupliciter contingit: uno modo ut modus expressus sit aliquis specialis modus entis. Sunt enim diversi gradus entitatis, secundum quos accipiuntur diversi modi essendi; et juxta hos modos accipiuntur diversa rerum genera... Alio modi ita quod modus expressus sit modus generaliter consequens omne ens; et hic modus dupliciter accipi potest; uno modo secundum quod consequitur omne ens in se; alio modo secundum quod consequitur unumquodque ens in ordine ad aliud;... Si autem modus entis accipiatur secundo modo, scilicet secundum ordinem unius ad alterum; hoc potest esse dupliciter. Uno modo secundum divisionem unius ab altero; et hoc exprimit hoc nomen aliquid;... Alio modo secundum convenientiam unius entis ad alius; et hoc quidem non potest esse nisi accipiatur aliquid quod natum sit convenire cum omni ente. Hoc autem est anima, quae quodammodo est omnia... In anima autem est vis cognitiva et appetitiva. Convenientiam ergo entis ad appetitum exprimit hoc nomen bonum; ut in principio Ethic. dicitur: Bonum est quod omnia appetunt. Convenientiam vero entis ad intellectum exprimit hoc nomen verum. (43)

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tio appetentis in aliquid. Nihil autem inclinatur nisi in aliquid simile et conveniens. Cum igitur omnis res, inquantum est ens et substantia, sit quoddam bonum, necesse est ut omnis inclinatio sit in bonum." -- Ia IIae, q. 8, a. 1.

43) De Ver., q. 1, a. 1. (Underlining mine.)

The good then is a general mode following upon every being, not considered in itself, but insofar as it bears a relation to some appetite, -- a relation of "convenientia", fittingness, suitability, proportion. It is in this "convenientia" to an appetite which the good expresses that we find its notion of appetibility, hence its "ratio finis".

Again in the De Veritate, St. Thomas explains this transcendental meaning of the good, but now with particular emphasis on the note of final cause:

> Et sic oportet quod bonum, ex quo non contrahit ens, addit aliquid super ens, quod sit rationis tantum... Verum et bonum positive dicuntur; unde non possunt addere nisi relationem quae sit rationis tantum. Illa autem relatio, secundum Philosophum in V Metaphys., dicitur esse rationis tantum, secundum quam dicitur referri id quod non dependet ad id ad quod refertur... sicut patet in scientia et scibili;... relatio vero qua scibile refertur ad scientiam, est rationis tantum;... et ita est in omnibus aliis quae se habent ut mensura et mensuratum, vel perfectivum et perfectibile.
>
> Oportet igitur quod verum et bonum super intellectum entis addant respectum perfectivi. In quolibet autem ente est duo considerare: scilicet ipsam rationem speciei, et esse ipsum quo aliquid aliud subsistit in specie illa: et sic aliquid ens potest esse perfectivum dupliciter. Uno modo secundum rationem speciei tantum; et sic ab ente perficitur intellectus, qui perficitur per rationem entis; nec tamen ens est in eo secundum esse naturale; et ideo hunc modum perficiendi addit verum super ens... Alio modo ens est perfectivum alterius non solum secundum secundum rationem speciei, sed etiam secundum esse

> quod habet in rerum natura: et per hunc modum est perfectivum bonum; bonum enim in rebus est, ut Philosophus dicit in VI Metaphys. In quantum autem unum ens est secundum esse suum perfectivum alterius et conservativum, habet rationem finis respectu illius quod ad eo perficitur; et inde est quod omnes recte definientes bonum pununt in ratione ejus aliquid quod pertinent ad habitudinem finis; unde Philosophus dicit in Ethic. Quod bonum optime definiunt dicentes, quod bonum est quod omnia appetunt. (44)

The good is the intrinsic and entitative perfection of a thing by which it is perfective of some appetite, and through its property of perfecting some appetite, it is appetible, and therefore a final cause. The notion of perfective perfection, hence appetibility, gives to the good its reason of final cause. It is for this reason that Aristotle can define the good as "that at which all things aim"(45), and why also he can reproach the poet for identifying term with end. The fact that something is ultimate in some process does not therefore make it the end or purpose for which the process took place. That ultimate stage must also be a good for the causing agent.

> That is why the poet was carried away into making an absurd statement when he said 'he has the end for the sake of which he was born'. For not every stage that is last claims to be an end, but only that which is best. (46)

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44) De Ver., q. 21, a. 1. (Underlining mine.)
45) Ethics, I, ch. 1, 1094a3.
46) Phys. II, ch. 2, 194a30-33.

Thus far we have given only a general purview of what we mean by end and its causality. Several restrictions have yet to be made in order to understand precisely how this doctrine applies to natural operations. But we can leave their treatment to a later occasion, for enough is known now to enable us to begin our discussion. It is feasible though to make this supplementary note: in view of what has just been said about the identity of end and good, we may then speak of form as being the end of matter. Matter is "being in potency"; form is that by which matter becomes "being in act". Form is then the perfection of the potency that is matter, and consequently a good for it. For this reason we say that of its very nature matter desires form as its end and good; it has a natural appetite for form.(47)

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47) "... forma est quoddam divinum et optimum et appetibile. Divinum quidem est, quia omnis forma est quaedam participatio similitudinis divini esse, quod est actus purus: unumquodque enim in tantum est in actu in quantum habet formam. Optimum autem est, quia actus est perfectio potentiae et bonum eius: et per consequens sequitur quod sit appetibile, quia unumquodque appetit suam perfectionem." -- In II Phys., lect. 15, n. 7; "Cum forma sit quoddam bonum et appetibile, materia, quae est aliud a privatione et a forma, est apta nata appetere et desiderare ipsam secundum suam natural." -- Ibid., n. 8; "Materia enim, secundum id quod est, est in potentia ad formam." -- Ia, q. 66, a.2; "Appetitus formae non est aliqua actio materiae, sed quaedam habitudo materiae ad formam secundum quod est in potentia ad ipsam." -- Q.D. de Potentia, q. 4, a. 1, ad 2.

A last remark before going into our problem. In the ordinary observation of natural beings we see that they act always or nearly always in the same way. A rock thrown into the air will always fall to earth unless obstructed. Particular floral seeds produce their characteristic blossoms. Each species of bird has its peculiar way of building its nest, and will always build it in that way. Yet, we witness other phenomena, like a dog being born blind, or a horse struck by lightning. All this would indicate that either everything happens by the necessity of matter, so that every natural event is fully determined in its antecedent conditions; or everything happens by chance, as the blind dog and the accidental death of the horse would seem to imply; or else nature acts for an end with the possibility of chance events not precluded. Aristotle's answer, as that of St. Thomas, is definitely the last, and as has already been stated, our purpose is to explain their teaching in as clear a manner as possible.

Chapter Two

CASUS ET FORTUNA

Immediately preceding his demonstration of purposeful activity in nature, Aristotle devotes a chapter to the discussion of chance and fortune. We may wonder why he places this treatment here, why he does not delay it until after proving that nature acts for an end. Chance and fortune are obscure causes, while the end is a more obvious cause. It seems more fitting to discuss what is clearly a cause before considering what is less evidently so. Moreover, to explain chance and fortune Aristotle makes use of our common sense recognition of purpose in natural operations; he presupposes that nature acts for an end when explaining the casual and fortuitous, and immediately afterwards proves what he has presupposed. Why not first demonstrate that there is purpose in nature? There are several reasons. One is expressed in this notation of St. Thomas:

> Initiata est autem inquisitio hujus scientiae ab admiratione de omnibus... Quae quidem admiratio erat, si res ita se haberet sicut automata mirabilia, idest quae videntur mirabiliter a casu accidere... Casualia enim non a causa determinata, et admiratio est propter ignorantiam causae. Et ideo cum homines nondum poterant speculari causas rerum, admirabantur omnia quasi quaedam casualia. (1)

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1) In I Metaph., lect. 3, n. 66; see also nn. 54-56.

Further the existence of the casual represents one of the principal objections to final causality in nature, and by invalidating it at the outset, we confer that much more facility to the working out of our main problem. Moreover, a clear understanding of chance as a cause will be of considerable aid in grasping the import of the statement that nature acts for an end, as well as the significance of the first argument in contention of that thesis.

Again, the recognition of chance is in itself a proof for finality, since exceptions prove the rule. Therefore by thus beginning our treatise we are imparting to it the momentum of an implicit affirmation on the part of our opponents of what we intend to prove.

I.- FORTUNE

A quick glance at the Aristotelian teaching on chance and fortune reveals a progression from effect to cause.(2) All learning, hence every study or science, is essentially an inquiry into what we do not know well on the basis of what we know best. It happens, however, that what is most known to us is most often less knowable in itself. A thing is knowable proportionately to the

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2) Cf. In II Phys., lect. 8, n. 1.

amount of actuality it has.(3) Thus, in itself the essence of a thing is more knowable, because more actual, than its accidents. An accident has actuality through the essence in which it inheres. Similarly, an intelligible object is more knowable than a sensible one. Yet, to <u>us</u> accidents and sensible things are better known, and through them we

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3) A thing is knowable to the extent it is actual (Cf. In IX Metaph., lect. 10), so that the more actuality there is in a thing, the more it is knowable in itself, and conversely, the less actuality, or more potentiality in it, the less it is knowable in itself. The essence that underlies the accidents of a thing is the reason of being and source of the actuality of the accidents. It is therefore more actual and more knowable <u>in se</u>. Intelligible objects being immaterial are greatly removed from the potentiality of matter and are therefore more knowable than sensible objects which are immersed in matter. God, Who is Infinite Actuality, is more knowable in Himself than creatures. But this does not mean that essences, intelligible objects and God are most easily, or first known, by us; in fact, we know them with difficulty and through things that are less knowable in themselves, namely, accidents, sensibles and creatures. This is because all our knowledge begins in sense. We know first sense objects which are joined to matter and so less knowable in themselves. Through them and by means of abstraction, composition and division, and discourse of reason, we come to know immaterial and eternal truths which, while being more actual and knowable <u>in se</u>, are however less evident to our inferior intellect. This is the natural way by which we acquire knowledge, -- proceeding "from what is more obscure by nature, but clearer to us, towards what is more clear and more knowable by nature". Cf. Phys. I, ch. 1, 184a9-b14; St. Thomas, lect. 1, n. 6; In VII Metaph., lect. 2, nn. 1300-1305; In De Trinitate, q. 6, a.1; In I Ethic, lect. 4, n. 52; In I de Anima, lect. 1, n. 15; Ia, q. 84-86; Q.D. de Ver., q. 11.

arrive at a knowledge of the essential and intelligible. Now in the study of nature that which we know most readily are the effects whence begins our search for the causes. For though in itself a cause is more actual than its effect, -- it gives the effect the actuality it has, -- and so more knowable, nevertheless the natural effect is more evident to us because it is more closely linked to sense wherein all our knowledge takes root.

> ... Sicut anima rationalis a sensibilibus, quae sunt nota magis quoad nos, accipit cognitionem intelligibilium, quae sunt magis nota secundum naturam, ita scientia naturalis procedit ex his, quae sunt nota magis quoad nos et minus nota secondum natural... Demonstratio, quae est per signum vel effectum, maxime usitatur in scientia naturali... quia, cum rationis sit de uno in aliud discurrere, hoc maxime in scientia naturali observatur, ubi ex cognitione unius rei in cognitionem alterius devenitur, sicut ex cognitionem effectus in cognitionem causae. (4)

This principle is fundamental to the whole study of nature, since it marks the way one must proceed in that science. We refer to it now for this reason. If chance is, it is a cause. But as a cause, it is extremely obscure, which is why some have doubted the existence of chance, and why others have attributed its causality to some divine orderer.(5) Casual events, on the other hand,

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4) In De Trinitate, q.6, a. 1.
5) Cf. In II Phys., lect. 7, n. 9.

are evident and undeniable. Hence by reasoning from them to the nature of chance as their cause, Aristotle is adhering to his principle of proceeding from what we know most easily to what we know least easily.(6)

This observation likewise enables us to appreciate the reason for dealing with fortune here. Our principal concern in this treatise is with the problem of finality in nature, and we are pursuing the discussion of chance and fortune only inasmuch as it furthers the attainment of our goal. In this perspective, chance comes directly under our observation, since it is the cause of the exceptional in nature's activity, and the exceptional presents a difficulty to the finalist theory. Fortune, on the other hand, has its sphere of influence in the operations of an intel-

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6) When employing the word "fortuna" to express the notion of change (cf. In II Phys., lect. 8, n. 2 *ff.*), St. Thomas makes use of this principle. Actually, as will be seen, chance is the generic term embracing chance and fortune as its species. Moreover, in the illustration there given, that a man is born with six fingers is rather a chance effect than fortuitous, since the agent (cause) of generation is nature and not an intellectual appetite. Still St. Thomas uses the word fortune, and for the excellent reason that the fortuitous is obvious to us. Acting as intelligent agents, we often see unintended effects arising out of our purposeful activity. To explain similar occurrences in nature, is it not best to use at first familiar terms and expressions until the general idea has been conveyed, at which time more precise language can be employed? It is simply an instance of throwing light on what is obscure by means of what is more evident.

lectual appetite[7], and so of itself it does not concern us, but warrants our attention only to the extent it can clarify our notions of chance.

In our day-to-day living we are faced with a certain regularity that at times reduces itself to humdrumness; day succeeds night and night day; rains come, rivers flow; old life gives way and new life is born. Yet, within the compass of this seemingly unalterable constancy, things happen to break the monotony of the pattern and make us conscious of it. The man with six toes, the cat without a tail, the freak storm, -- it is the likes of these that occasionally enter the range of our experience, and it is the fact of their recognition that Aristotle wishes us to take into account here. As Chesterton says: "The world will never starve for wonders; but only for want of wonder." Men witness these rare occurences, and call them casual events, positing chance as their cause. What is this cause called chance? Perhaps we can find the solution by looking at similar instances in human actions.

Socrates takes a walk to the store to buy some vegetables. While there he meets a friend, who is indebted to him to the sum of five dollars. The debt is promptly

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7) See Phys. II, ch. 6, 197b1 ff.; St. Thomas, lect. 10, nn. 5, 7, 8.

dissolved. This pleasant outcome was not the reason why Socrates decided to go to the grocery store; the encounter with his debtor was something unexpected, something he had not foreseen, and therefore not intended. For that reason we say it was a stroke of good fortune for him, and conversely, of bad fortune for the debtor, if he had wished to avoid Socrates. But now, how is fortune said to be the cause of this fortuitous episode? First, we note that the fortuitous effect (the meeting) is an accidental unit.(8) Since meeting his debtor was not a motive impelling Socrate to go to the store, but was actually something outside of his per se intention, we cannot speak of any essential relationship between his going there and his happy encounter; otherwise everytime Socrates walks to the store, he must meet his friend. Consequently, the fortuitous effect is really something accidental, accruing incidentally to what is directly intended.(9) In Aristotelian terminology, we can express it this way: the fortuitous effect is an ens per accidens that happens to a per se effect. But an ens per accidens can only have a per accidens cause, and this per accidens cause is fortune.

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8) Cf. In I Periherm., lect. 14, n. 14.

9) Cf. In II Phys., lect. 8, n. 8; In VI Metaph., lect. 2, esp. nn. 1184, 1185.

> Causa per accidens dicitur dupliciter: uno modo ex parte causae; alio modo ex parte effectus. Ex parte quidem causae, quando illus quod dicitur causa per accidens, coniungitur causae per se; sicut si album vel musicum dicatur causa domus, quia accidentaliter coniungitur aedificatori. Ex parte autem effectus, quando accipitur aliquid quod accidentaliter coniungitur effectui; ut si dicamus quod aedificator est causa discordiae, quia ex domo facta accidit discordia. Et hoc modo dicitur fortuna esse causa per accidens, ex eo quod effectui aliquid coniungitur per accidens; utpote si fossurae sepulchri adjungatur per accidens inventio thesauri. Sicut enim effectus per se causae naturalis est quod consequitur secundum exigentiam suae formae, ita effectus causae agentis a proposito est illud quod accidit ex intentione agentis; unde quidquid provenit in effectu praeter intentionem, est per accidens. (10)

Mark well, it is the per se cause, when fulfilling the role of an accidental cause, that is denominated fortune.(11) Just as the builder, who is the direct cause

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10) In II Phys., lect. 8, n. 8.

11) This is one of several points that L.E. Foley has failed to grasp, at least so his article (Chance and the Fortuitous in a Philosophy of History, in review The New Scholasticism, Vol. 22, 1948) seems to indicate. He states: "Chance is an event brought about by the meeting of two orders of per se causality...." "since chance does not have a cause as such, etc.", p. 308. Foley has further added to the confusion by reversing the application of the terms "chance" and "fortune" as employed by St. Thomas. When Foley speaks of chance, as in these citations, he means fortune, and vice versa. In any event, for him both chance and fortune are not causes but effects; and he declares this immediately after thus citing Aristotle: "It is clear then that chance is an incidental cause." Cf. In VI Metaph., lect. 3, n. 1201.

of the house, is said to be the accidental cause of what occurs in it, so it is Socrates, the per se, or direct, cause of going to the store, who is called the accidental cause of the reunion with his debtor. Socrates then is fortune, not in as much as he is a per se cause, but in the measure that he is an accidental cause. Accidental causality must be explained by per se causality, just as accident is explained by substance.

It may be adverted to next that the per se intended effect, with which the fortuitous effect is conjoined, is something willed by an intelligent agent. Hence fortune is found only in deliberated activity, in the operations of moral agents.(12)

The fortuitous effect remains in itself something that could be the object of a per se intention, that is, something sought or repelled in itself: Socrates could have gone to market with the sole desire of meeting his debtor.(13) This is the most essential characteristic of both fortune and chance, and it revolves upon the notion of good. The fortuitous event must always be a good (since it is a good to avoid evil, bad fortune is included) for the moral agent to whom it happens. The significance of

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12) Cf. In II Phys., lect lo, n. 5.
13) Cf. In II Phys., lect. 8, nn. 6, 7, 9.

this statement can be readily seized if we consider how many things could have happened incidentally to Socrates, to which we would not confer the name fortuitous. There could have been a bird atop a telephone pole, a pretty waitress, passing buses, etc. ad infinitum; -- all of which have no meaning for Socrates, because they confer no good on him; yet they are things that accidentally happen to him on his walk. If, on the other hand, the bird was his lost canary or the waitress became his wife, or one of the buses, which he decided not to take, skidded off the road into the river, these events would then take on a different color, because they would have the nature of a good in relation to Socrates.

This recognition of the indefinite number of events that could have happened to Socrates makes us mentally alive to the indeterminacy of the cause that is chance. And the indefiniteness is two-sided. Socrates in fact went to the store to buy vegetables, which was the occasion of meeting his debtor; however, not only an infinite number of things could have occurred to him besides receiving the five dollars owed him, but also he could have gone there for an indefinite number of reasons: to pay a bill, to see his girl friend, etc. From both vantage points we discover fortune to be an indeterminate cause.(14)

Lastly, we must say that fortune can only be the

cause of those things that happen rarely.(15) If Socrates often met his debtor when he went to the store, his encounter this time could not be considered a result of fortune.

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14) If Foley had taken this into account, he would hot have made the statement: "Hence, to speak about 'accidental causality' is not quite correct. The reality of the event (chance for him) is to be found in each order which occurs in the event." -- Op. cit., p. 308. The very indeterminacy of fortune precludes any mention of proper causality, and it is the very reason of accidental causality: "Causa per se est infinita et indeterminata, eo quod infinita uni possunt accidere." -- In II Phys., lect. 8, n. 8; see also Ia, q. 116, a. 16; In I Periherm., lect. 14, n. 13.

15) Cf. In II Phys., lect. 8, nn. 2, 9. "... quod non omne quod est praeter intentionem oportet esse fortuitum vel casuale, ut prima ratio proponebat. Si enim quod est praeter intentionem sit consequens ad id quod est intentum vel semper, vel sicut frequenter, non evenit fortuito vel casualiter, sicut in eo qui intendit dulcedine vini frui, si ex potatione vini sequatur ebrietas semper vel frequenter, non erit fortuitum nec casuali; esset autem casuale, si sequeretur ut in paucioribus." -- Contra Gentiles, III, ch. 6. Mr. Jacques Maritain seems to have overlooked this. He recounts an incident of two men driving from opposite points and meeting at a crossroads at 6:30 every Thursday morning. "Every Thursday at half after six they pass each other <u>regularly</u> at the quadrant of roads; yet their meeting is chance, too, since it results from a simple conjunction of two independent series of causes." And he adds: "to describe which the ancients used the word fortuna." The fact is the Ancients would not call it fortune because two essential properties are lacking: rarity of instance, and the presence of a good. In a footnote Maritain acknowledges the factor of good as requisite, but insists the "word 'chance' could be applied to this <u>regular</u> meeting of two independent causal series." if the property of good were supplied. See J. Maritain, <u>Reflections on Necessity and Contingency</u>, in "Essays in Thomism", edited by R.E. Brennan, O.P. (N.Y.: Sheed and Ward, 1942), pp. 35, 36; underlining mine.

One must be cautious not to equate the exceptional instance with the fortuitous. Every fortuitous event is exceptional, but not every singular occurrence is fortuitous. A pole-vaulter may fail in a hundred attempts to clear the horizontal bar, and succeed only once; yet we would not call in fortune here, because to clear the bar was his direct intention on every try. The pellet that wounds the pheasant is only one of the many dispersed from the birdshot cartridge. That it alone reached the target is not fortuitous, for it is the result of the huntsman's intention. He always uses such a cartridge with many pellets in order to insure a hit. It is only the exceptional event, which arrives outside the intention of the moral agent, that we call fortuitous.(16)

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16) The same is true in the case of chance. Only that which occurs rarely outside the intention of the natural agent is casual. Relatively few of the myriads of spores produced by a sporophyte reach favorable ground and germinate; yet, when one does, it is not called casual, but the intended goal of nature who uses the many to assure the accomplishment of her direct purpose, the germination of the few. A modern author, when formulating principles for detecting purposeful activity, calls our attention to this: "The biased result or purpose should not be considered in every case as necessarily the average common result. There are cases where the purpose of an event falls short of being average to that class of events. The function of an acorn is to grow into an oak tree, yet actually a very small number of acorns become oak trees." -- Y.H. Krikorian, Teleology and Causality, Review of Metaphysics, Vol. 2, 1948-49, p. 48.

From these reflections the definition of fortune can be formulated: Fortune is an accidental cause (viewed from the side of the effect) of something which comes about rarely, and which is among those things that could be purposely intended by a moral agent.(17)

II.- CHANCE

Casting our gaze now on the field of casual phenomena, we can examine this illustration. A lioness, returning from a food-seeking stroll, discovers the disappearance of her two cubs. Instinctively she begins to track them down, and follows their scent to a brook hardby, where the spoor is lost. She does not cross the brook, but wanders fruitlessly up and down its bank, until she finally gives up the search. The next day, hungry again, the lioness spies a delicious-looking kudu, and begins to stalk it. She pursues her prey to the brook, then across it, and lo! she stumbles upon her straying cubs. This incident, which was casual for the lioness, evinces the almost identical nature of chance and fortune. We have, first of all, a *per accidens* effect (finding of the cubs) accruying to a per se intended effect (stalking of the prey), which per

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17) Cf. Phys. II, ch. 5, 197a4-7; St. Thomas, lect. 9, n. 6.

accidens effect remains in the category of things that can be directly desired: finding her cubs is undeniably a good for the lioness and she certainly would have directed herself forthwith across the brook had she known they were on the other side.

This casual effect has then an accidental unity which must be attributed to an accidental cause.(18) That cause is chance, and it is the lioness in as much as she is an accidental cause, which is to say, that in being the per se direct cause of crossing the brook, she is the accidental cause of regaining her cubs. That this is an exceptional instance is evident, as is the presence of indetermination in the causality: the possibilities of what could have happened to the lioness are as indefinite as the number of things that could have impelled her to cross the brook.

There are still these differences between chance and fortune that ought to be heeded. The first has been remarked already, but it can bear repetition. Chance as a generic term includes both voluntary and non-voluntary agents. Chance, as a species, is a cause only of the exceptional that results from natural operations, while fortune

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18) "Eorum enim quae sunt aut fiunt secundum accidens, oportet esse causam secundum accidens, et non determinatam." -- In VI Metaph., lect. 2, n. 1186.

works in the sphere of deliberated activity.

> Omne quod est a fortuna est a casu, sed non convertitur... Casus non solum est in hominibus, qui voluntarie agunt, sed etiam in aliis animalibus, et etiam in rebus inanimatis... Ostendit (Philosophus) in quibus maxime casus differat a fortuna. Et dicit quod maxime differt in illis quae fiunt a natura; quia ibi habet locum casus, sed non fortuna. Cum enim aliquid fit extra naturam in operationibus naturae, puta cum nascitur sextus digitus, tunc non dicimus quod fiat a fortuna, sed magis ab eo quod est per se frustra, idest a casu. (19)

Yet, nature is an intrinsic principle determined to one, while the will is an extrinsic principle and undetermined, and so we have a basis for a further distinction:

> Et sic possumus accipere aliam differentiam inter casum et fortunam, quod eorum quae sunt a casu, causa est intrinseca, sicut eorum quae sunt a natura; eorum vero quae sunt a fortuna, causa est extrinseca, sicut et eorum quae sunt a proposito. (20)

While it is true that every cause per se is extrinsic to itself in as much as it is a cause per accidens, nevertheless, in distinguishing chance and fortune, we say that chance is intrinsic, because chance is nature as an accidental cause, and nature is an intrinsic principle of action; whereas fortune is extrinsic, since fortune is the will as an accidental cause, and the will is a principle of operation extrinsic to nature.

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19) In II Phys., lect. 10, passim.
20) Ibid., n. 10.

In fine, we may posit this definition of chance: Chance is an accidental cause (viewed from the side of the effect) of something which comes about rarely, and which is among those things that could be directly intended by nature.

Such is, in short, the Aristotelian conception of chance. It is certain that our exposition of it is not complete, and, moreover, will not be until we have investigated the notion of contingency, at which time we will be in a position to perceive how it is that chance effects are possible. For the present our knowledge of chance is sufficient to allow us to realize that it will not offer an insuperable obstacle to a theory maintaining that nature acts purposively. To the contrary, casual events, that is, the exceptional cases that result from the activity of nature, seem to prove finality, and not merely in the sense that exceptions prove the rule. It is something more radical than that. Chance presupposes finality. As we say, chance is the cause of attaining one end that is not intended, while pursuing another end that is intended; as a consequence, where there is no action for an end, there can be no question of chance. The classical objection to this assertion would be the determinist hypothesis in which natural events are

interpreted as necessary results of prior causes, thus excluding finality and seemingly accounting for the casual and fortuitous. This objection will be duly met at the opportune occasion. For the moment it is desirable to undertake the demonstration of our thesis that nature acts for an end.