Chapter Thirteen Math & Nature? Outline 34-4

~~Lesson III~~

NATURAL DOCTRINE AND MATHEMATICAL PHYSICS.

1. Whether it pertains to the present treatise to discuss their distinction or their unity, why and how the problem arises at this point.

2. Sciences treating the same subject are either the same, or one is part of the other. Points, lines, surfaces and bodies can be considered mathematically as well as experimentally. Hence it would seem that in this regard mathematics and physics are either the same, or one is part of the other. Astronomy is a case in point. Based on the measurement of macroscopic phenomena, which exhibit unusual uniformity and rigour, astronomy showed very early that natural phenomena are amenable to mathematical treatment. The phenomena being admittedly natural, it would seem that, here at least, physics does not differ from mathematics.

3. To solve this problem we must first point out in what the subject of mathematics, qua mathematics, differs from the subject of the study of nature. Both treat of points, lines, etc., but not in the same way. The former does not consider them as terms of a natural body, directly or indirectly known to sense. He considers these objects "apart from sensible and natural matter".

4. Why and how things that are inseparable in reality, can be separated by the mind. In what sense abstraction is proper to mathematics, and how this is based on the very nature of quantity. Whether a being that has nature, is necessarily quantified. Abstraction of "whole" and abstraction omit

of "form". What is meant by form, in this context, Why there cannot be as many kinds of abstraction as there are categories. Whether number and magnitude are the subject of mathematics inasmuch as they are common sensibles. Whether there can be a science that is common to number and magnitude. Whether the subject of projective geometry is still quantity. Why "intelligible matter" has been called a "hybrid notion".

omit (great stuff but too much for beginners)

5. How mathematics abstracts from movement as well as from sensible matter eventhough the mathematician considers points, surfaces, series, etc., in movement. If truth is conformity of mind with "what is", how can mathematics be true? Whether mathematical and logical abstraction are the same. An Aristotelean interpretation of the "essentialism" attributed to Aristotle. Whether mathematics can verify its principles. Plato's teaching in this connection.

6. What is meant by a physico-mathematical science. Whether its principles are abstract. Why it is called "subalternate" and "intermediary". Whether its subject is one. Whether it is a "species" of mathematics. Why, though formally mathematical, it is mainly natural.

7. Whether it applies to all things that have "nature" in the sense defined. Whether living beings are amenable to mathematics, qua living beings. Some opinions of modern biologists on this subject.

Lesson IV

THIS SCIENCE CONSIDERS NOT ONLY MATTER, BUT FORM IN MATTER AS WELL.

1. Since natural science is about nature, and nature is said of both matter and form, does this science consider form as well as matter? Why the question is raised about form, as if it were evident that natural science considers the material, but less so that it extends to form.

[The study of living beings will raise the same question in reverse order, i.e. whether they should be defined with matter as well as with form.] Since form is not the same as matter, does the same science consider them severally, or in composition? Comparison with Mathematics.

2. Whether to know "what a thing is made of" (e.g. that this table is made "of wood") is the same as to know "what it is" (e.g. that this wooden object is a table)? Can one know "what" a natural being is without knowing what it is made of? On the Platonic mode of defining natural things.

3. The "physiologists'" procedure in the matter: things are what they are, exclusively because of what they are mixtures of. [Analogy: "This is a house because it is something made of bricks, cement, wood, etc."] The likelihood of this view. Why the analogy is rejected. Modern philosophers who concur with it.

4. That natural science must consider form as well as matter, can be shown from analogy with art, which imitates nature. Why the example of medicine is appropriate.

In what respect all arts imitate nature; yet only some are called arts of imitation. Whether to imitate nature is the same as to intend imitation.) omit

5. Argument from the aim of science. What is meant by "matter is for the sake of form". The difference between "end" as what merely comes last (e.g. the end of a line, or the end of Socrates' life, meaning his death) and the end or purpose,

viz. what is last as "that for the sake of which" (e.g. "to be lived in" as the reason why the house was built). Why the latter is called that which is "best", instead of "good". The distinction between the end as that being for whose good something is, or is done; and the end as something at which the action aims.

6. That form, with regard to matter, is "that for the sake of which", can be shown by comparison with the coordinated arts and crafts of building. In what sense all artifacts are for our own sake. The difference between "the art that uses the product" and "the art that directs the production of it", and their order. The use is "that for the sake of which" the artifact is make, as a ship for navigation. Matter is to form, as the form of the artifact is to the use.

7. Of those things which are "toward something" and of "that toward which" they are, the science is the same. But matter is "toward" form, as toward that for the sake of which it is. Whether this makes of matter a relation. The distinction between "relation", "to relate", and "to be related"; between "to be a relation", and "to be nothing but relative to". If matter is the latter, the same science treats of both matter and form. -- Whether this argument takes for granted that natural science is concerned with the material. [Compare with n. 1.]

8. To what extent this science seeks to know the form and "what" of natural things. Analogy with arts and crafts. The doctor does not study the nerve for the mere sake of knowing as the physiologist does, but for the sake of health; the

carpenter does not have to know botany, so long as he knows how to handle ~~what~~ kind of wood for a given purpose. Natural science does not consider form as such, but form as in matter; nor does it consider "what a thing is" absolutely, but only in terms of what is given in sense experience.

9. Whether to know that there must be that in virtue of which a horse is a horse and different from what a cow is (as horse-raisers and dairy-farmers still have reasons to believe), is the same as to know what it is. Whether the "what it is" in the question "What is a horse?" is the same as "what a horse is". How the identification of the two, i.e. of what is in the mind only, with what is in things, gives rise to a certain type of "quiddities" as well as of critics whose rejection of them assumes the same confusion. The creation of such quiddities à propos of natural things, is sometimes called Philosophy of Nature. Whether the question "what is it?" is legitimate in the study of nature. Whether a question becomes vain so soon as we know that we shall never find the ultimate answer, and whether as a consequence a horse ceases to be what it is, viz. a horse and not non-horse. Whether "what" a thing is and to be "this" thing, or "to be horse" and "to be this horse" are the same. Hegel and Lenin on this subject; their idea of "concrete universal".

omit

unprofitable

omit

10. The ultimate term of natural science is to know the first principle of life in man. This principle has the nature of form, but the present science can consider it only as in sensible matter.

form or

Whether we can know what our reason is without knowing what the human body is, and vice versa. Whether we can know what reason is without knowing what imagination is, and imagination without knowing where and what is its organ; and its organ without knowing its elemental components or structure. Whether the natural rule of defining with matter extends to reason itself. Whether the study of man presupposes all the other branches of natural science.

intellect

Omit or summarize very briefly without part.

Chapter Fifteen

Nature

Lesson V

WHETHER THE SCIENCE OF NATURE SEEKS KNOWLEDGE OF CAUSES.

1. Why should there be question of causes in the study of nature any more than in mathematics? Why an introduction to natural science should consider the various kinds of causes as well as their "modes". To know why a thing is what it is, i.e., all that without which it cannot be, is to know its cause or causes. Whether the causes to be considered here are causes of things, causes of knowledge, or both. Why we must first consider the division of causes on the basis of artifacts and actions.

2. Why, of the various kinds of causes, we must consider first of all "that out of which a thing comes to be and which persists within the thing", i.e. the material. Whether, of all causes, the material cause is the one which is best known to us, when "cause" is said first of the mover or agent. Even today, the word "cause" first brings to mind an "agent", one who makes or does something, who pushes a cart, makes shoes, or knocks someone down; in modern philosophic literature, "cause" and "efficient cause" are frequently equated, and further reduced to a single kind, viz. the mechanical. Whether from this it follows that in discussing the notion of cause and to defend it we must consider first of all the cause which first received this name "cause". The distinction between cause as principle and cause as cause.

3. Secondly, after matter, cause is said of "form" in the sense of

"kind", as in answer to the question "what kind of thing is this?" Form, in ~~that~~ this sense, is the reason why we know "what" this individual thing is ~~###~~, when we do. E.g., these sounds make up an octave, because of their proportion, viz., 2 : 1; this proportion is called "form", and the duality the form of this proportion. Any integer is another instance of form in this sense.

Why these instances are well-chosen. Whether to be a number is the same as to be a collection, e.g. whether two is the same as one plus one, three the same as two plus one, etc.; one two, incidentally one and the same as two ones. Whether all collections are numbers. Whether diverse collections are different kinds of collections, and whether diverse collections of the same kind are definable.

Omit!

4. Form as cause, in the present context, is that which is signified by the definition. Only to the extent that I know that by reason of ~~what~~ Socrates is a man, do I know Socrates as a man. Yet it is only by knowing a "this man" that I come to know "man", and know Socrates as "a man". Analogy of an artifact, e.g. a wooden table; to convey what it is as a "this kind of thing", it is not enough to state that it is a wooden something; ~~nor are~~ and yet the composition and form (in the primitive sense) or figure of the table are not something ~~[illegible]~~ apart from the wood, although the wood could have another composition and figure, making it something of another kind, such as a chair. Form, as that which the definition signifies, and by which we know that this thing is a table, comprises both matter, i.e. what it is made of, and form (the figure), in the sense of parts, and is called "form of the whole". The distinction between "parts of the matter". Why that which the definition expresses is called "form", and why "intrinsic form". Whether mathematics is concerned with form understood in this sense of cause.

, a given case of the form in matter

Our conclusion is that

"parts of the definition" and

In footnote if at all

5. Whether form, understood ~~of~~ and what is meant by form as "part of the definition", viz. that which determines the nature of what is defined, is also cause. Whether it is cause of knowledge, cause of the thing, or both. Why, in the present context, this meaning of form presupposes form understood of "what is defined".

Omit ?

6. Cause is also said of that form of a thing, which is outside the thing of which it is the form: the "exemplar", "archetype", or idea according to which something is made or comes to be, as the idea which the shoemaker has of shoes.

The distinction between the idea of shoe, without which he could not make a shoe, but which is not exhausted by the making of this shoe; and the idea of this shoe, without which he could not have made this shoe, as distinct from the idea of that shoe. How the former meaning of "idea" corresponds to the "form of the whole", and in what both meanings of idea have the nature of form and cause. The Platonic view.

7. The third kind of cause is "that from which a movement or rest begins", such as the man who gave the advice is a cause of what was done as a result of the advice; or the father of the child; or anything that brings about the change of what is changed.

Whether the type and order of the two examples are relevant. Why the first is taken from human action; and why not "decision" instead of "advice". Why the second instance, taken from nature, should be taken from human nature in particular, and why fatherhood should be chosen.

Omit

8. The counsellor is only one of four kinds of efficient cause. The others are: the completive (e.g. the housebuilder), the dispositive (e.g. the brick-maker or the lumber-man), and the auxiliary or secondary cause, as distinguished from both principal agent and instrument (e.g. the military, acting for the good of civil society). The counselling cause differs from the main or principal cause inasmuch as it conveys to the agent the purpose, and the form by which he acts, such as the naval architect to the ship-builder. Whether counsel is the same as deliberation.

Omit or perhaps relegate to footnote

9. Whether this division of efficient cause is pertinent to the study of nature. How the neglect of this division and, more particularly, of "counselling cause", which is intellectual, is largely responsible for the confusion aroused by the principle of inertia and by the general idea of evolution. How its denial is due to "anthropomorphism".

Outline

10. Cause as "that for the sake of which" a thing is done as in "to take a walk for the sake of health". When, in answer to the question "Why is he taking a walk?" and, knowing his purpose, we reply "To be healthy", we think we have assigned the cause.

Historically, final causality was the last to be examined as a cause in nature, and later, the first to be rejected, even avant la lettre, by the Scholastics themselves. (From Durandus to Descartes, and thereafter). Whether final causality should be examined first in the order of arts and crafts, and not in that of human action from which, nevertheless, the first instance was chosen.

should be confined to a general statement

11. Whether only what is produced last of all has the nature of final cause. Whether we consider as causes "for the sake of which" such things as tools, what we make with them and whatever is performed this side of what is last, such as a pestle to pound the drug, the physic and its administration, the purgation and the slendering, health being what is ultimately intended; or the saw, the board, building and the house itself, all of which are for the sake of habitation, are themselves causes as "that for the sake of which". Whether result is the same as final cause.

Why philosophers, in the main, and modern Scholastics in particular, look down upon such simple preliminary and extrinsic considerations as trivial, irrelevant to the study of nature, and unworthy of ~~lofty thought~~. How the neglect of these considerations renders absurd the very question of action for an end in nature. To neglect them is a specious kind of anthropomorphism. That nature acts for an end is to be shown, not at this juncture, but only after "chance" has been defined.

omit

12. Why it is natural that the ancient philosophers should have confined themselves to material causality, reducing all other to it. This view is prevalent today, but for quite different reasons. Why Descartes denied all final cause in nature. It is vain to try and answer Hume's criticism of causality in general when we grant that efficient cause is first and most certain to us as cause, and overlook that he uses terms according to later impositions and abstract meanings as if they were first, such as "principle", "cause", "mind", "understanding", "reality" and "causality". The same holds for Kant.

13. One and the same thing can have many per se causes, e.g. a statue: the matter (stone), the form or shape, the sculptor, his skill and idea; the statue itself is a cause, as well as that which the statue represents; and also the seeing of it. The complete definition of a house would embrace the definition of every kind of cause upon which a house depends per se as a house. What is meant by the statement: "A complete definition differs from demonstration by position only".

14. Causes of a different kind may be causes one of the other and be respectively prior one to the other. Practice leads to skill, and skill was the aim of the practice. But skill was first according to reason, as "that for the sake of which"; whereas practice is prior to possession of the skill. Likewise, the subject from which something becomes absolutely is prior to that which becomes, and the latter is prior as "that for the sake of which". For, that which becomes has the nature of good by reason of what we called form, and its subject is "for the sake" of what becomes.

15. The same cause may be cause of contrary results, in being held the reason for something brought about because of its absence. The wreck of a ship may be ascribed to the absence of the pilot whose presence was the cause of its safety. Whether cause and reason are the same. Whether such a cause is more than a reason.

16. All the causes so far enumerated can be reduced to four in kind: (a) Letters are causes as elements of syllables.

The elements of speech provide, in fact, our most definite and verifiable notion of element, i.e. "the first component within a thing and indivisible in kind into other kinds". Why the fundamental notion of element should be taken from an artifact. What is called a "chemical element" is not an element in this strict sense. Though we might show that there must be elements in nature, we do not actually know them; to that extent, physics tends toward knowledge of them as toward a limit which it can never be sure of reaching.

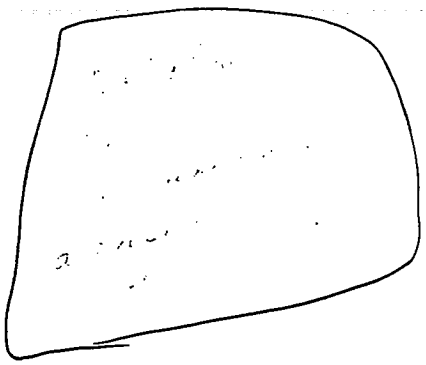
Clay is the material cause of a brick, silver of a cup. Anything that has the nature of part is as the matter of the whole. Propositions, because of their terms inasmuch as these are "that out of which something becomes" -- viz. the conclusions, which are made up of these terms -- are material causes. But those things which are wholes, compositions, or which are complete without being a whole or composite such as the ultimate constituents in nature, have the character of form.

17. That parts are material causes of the whole does not contradict what was said earlier, viz. that the parts of the definition reduce to formal cause. For what is defined has the nature of form with regard to this thing, as "man" compared to Socrates. However, when we consider "what is defined", in itself, the parts of the defined are as matter. -- Whether, in view of these parts, whatever is definable is a composite. ?

18. Other causes fall under the heading of "that from which something comes forth" either as movement or rest, such as the sperm, which is active in fecundation by penetrating the egg; or the doctor when bringing about health; or the one who gives advice, and whatever makes something. Propositions, too, are reduced to this kind of cause inasmuch as they produce the conclusion, thanks to the discourse of reason.

19. Finally, there are those things which are a good, and good has the nature of cause inasmuch as it is that for the sake of which something is done.

To reject this kind of cause, as shall be explained in further detail later on in this book, is to deny that there is any good in nature, at least apart from whatever use we may derive from nature for our own sake. Now, just as we had recourse to artifacts for the sake of illustrating the notion of final cause, so can the artifact be used to deny finality in nature. We said that all works of art or craft are in one way or another made by man for his own sake. Suppose, then, that nature could be conceived as a mere machine, as a purely mechanical whole, making allowance for greater complexity than that of any tool or machine of our own making -- at least until we would have attained knowledge of its general laws. On the other hand we admit that nature, considered in itself, is quite distinct from the order of human action and making. Unless, then, we could relate nature to man as we do our own works, it would be ~~as devoid of~~ good and final cause only as a discarded machine we never made in the first place, but useful to us as scrap. Obviously, on these terms, it would be silly even to enquire whether good and appetite can be considered in nature apart from man. But why has the question become so foolish?



~~20.~~ There is still another perspective in which the question of final cause in nature is quite out of season. Mathematics, because of its own type of abstraction, has nothing to do with final nor with efficient cause. All its definitions are purely formal, and when a demonstration is made from parts such as the sides or the angles of a figure, these parts must be understood as intelligible matter. The same holds for mathematics when applied to nature. Now, if we held in principle, as many do, that mathematical physics should eventually account for whatever is in nature, assuming that ~~knowledge~~ statements which are not mathematical are but the expression of our ignorance, then, to insist that the application of mathematics should be confined to things ~~inasmuch~~ insofar as ~~they are~~ homogeneous, i.e. quantified, whereas this is not all that they are, ~~this restriction~~ would be a mere residue of anthropomorphism. However, if ~~that~~ this assumption is not true, and the fact is that things are not as simple, the accuser's own anthropomorphism is unmasked, a rather humourless kind at that, the more silly for being "scientific", and unworthy of the superstitious savage.

First draft of complete text to end of lesson VIII

20. Confining ourselves to the illustration from artifacts, where these notions of cause are first and best known to us, it is plain that our purpose in making things is the first of whatever we have so far called causes, even though it is the last to be considered, and most difficult to establish that it acts as a cause in nature as well as in human making and doing. Thus, in the building of a house, the future resident for whom the house is built, and "for whom" to live in a house is a good; and the house itself, thanks to which this good end can be achieved (the end "by which"), are plainly the cause of all the other causes. It is for the sake of this that the builder works; to this end, such or such a composite structure is conceived, its conception implying that it be made out of such and such material. For this reason we say that the end is cause of all the other causes.

21. Spinoza, in his Ethica ordine geometrico demonstrata (Part IV, Preface) using the same example -- but which he already interprets in the light of his deductive system -- inverts this order of causes. "That cause, which is called final, is nothing but the human appetite itself, inasmuch as it is to be considered the principle or primary cause of a thing. E.g., when we say that habitation was the final cause of this or that house, surely we mean only that a man, having imagined the advantages of living in a house, had the desire to construct a house. To live in a house, inasmuch as it is considered to be a final cause, is actually no more than a particular desire, and this is truly the efficient cause; it is considered primary because men are usually ignorant of the causes of their desires". True enough, the efficient cause is first in the actual making of a house, for until then it had been only intended as something to be brought about, but which had not begun to exist. Yet, if the building is actually undertaken, surely it is because of "the advantages of living in a house", advantages conceived as desirable. In this instance, the "advantages", which

awakened the desire, were not already there, in existence, yet, even when merely known as advantages that ~~can~~ might be brought about, they did arouse the appetite and thereupon set one on to build. ~~Not that whatever one pursues does not as yet exist; and if it does, it is not as yet possessed — for one might want a house that is already there.~~ We must note too that, according to Spinoza, "good and evil are nothing either positive or negative, in the things themselves, outside the modes of thinking, or notions, formed by our mind by comparing them one to the other". (Ibid.) He reasons as follows: Comparing man and cabbage, we say that man is more than what the cabbage is, the former drawing mathematical conclusions, say, whereas cabbages apparently do not, and so we qualify the cabbage as imperfect.

This should not be taken to mean that we pursue only things which do not yet exist, for we may easily want a house already built, but when we do, we desire it as not yet possessed.

But there is more to it than ~~that~~ this. A man is not a good man just because he is a man, nor even for being good only inasmuch as he is a man; and a good cabbage should be compared to a spoilt one -- although spoilt in "spoilt cabbage" does not mean quite the same as in "spoilt child". Nor is a cabbage imperfect, in the sense of lacking something it should have, because it is not a man. On the other hand, while being good as a man, a person may easily be less perfect than the meanest of all beasts. Now it is true that nothing is called good or desirable unless related to appetite. We cease to desire and relish food when we have had our share, but when we do want bread, stones have no appeal. And so there must be a proportion between want and wanted, but it is not the want that invests the wanted with what can be wanted.

Omit in Heaven

Nor is it surprising that Spinoza should go on to define the good as "that which we know, for certain, to be useful to us". (Ibid., Def. I) For such, indeed, is the sole good of an artifact, e.g. a man-made shelter or a machine; and even food, which both horse and man naturally pursue as something pleasant (a good called delectable), can be rated among useful things when we compare it to the end of nature, such as growth or survival. Yet in confining good to usefulness or pleasure of this kind, Spinoza goes from one extreme to the other: after the general assertion that "perfection [understood as neither good nor bad] and reality are one and the same" (Part II, Def. 6) he reduced whatever is good to the kind which is, of course, first and best known to us, but which has only the nature of what is pleasant to sense, or of a means. Anything of this kind is deemed ~~it~~ good because of "that for the sake of which it is", and not without this, except perhaps in some other respect.

22. Now, since we said that final cause has the nature of good, and our first example was health as that for the sake of which one may take a walk, we must note that so far as man is concerned, and insofar as he acts by choice, the final cause (end) may be a bad one. But this does not contradict the general statement that we act for the sake of a good, for even that which is not really a good at all, but only apparently so, such as excess of food or drink, or unjust possession, is still pursued as a good by the one who chooses it, knowing all the while that it is not right. ~~Let us recall, however, that especially with regard to final cause,~~ But so far we are speaking of final cause only as influencing man's affairs, and we would indeed be guilty of anthropomorphism if we assumed straight off that, because ~~we~~ man, in ~~our doing and making~~ his making & doing, acts for an end, nature too acts for an end. ~~even though we spontaneously believe, treating them~~ Of course we can scarcely help believing, and treating them accordingly, that ~~our~~ dogs do not like to feel cold, ~~that~~ or hot, and that they enjoy this or that kind of food and pursue it ~~for the sake of pleasure. That nature,~~ because they do; but nevertheless that nature, as such, in everything and everywhere, acts for an end is something which remains to be ~~shown~~ proved. ~~Many philosophizing people today would insist that they do not know, in a way which conveys that they do not really care,~~ whether nature acts for an end.

Lesson VI

DIVISION OF CAUSES ACCORDING TO THEIR "MODES".

1. While the number and nature of the kinds of cause are four, the modes of causation too are many. These are gathered from the various ways in which a cause, even of a simple kind, may be related to its effect.

2. For one cause may be prior to another of the same kind. For instance, medical art is for the sake of healing, and when it restores health, it does so as an efficient cause. But medical art is an art and not every art is medical; building houses and playing the flute come under the general heading of "art". And so when we say that Socrates' health was restored by art, and not by nature alone, but without specifying any particular kind of art, we assign a general cause. In this context, the general cause is called the prior one; and the particular, the proper cause. Speaking of formal cause, we had mentioned the octave, which is "a two to one proportion of sounds". It would also have been true to say that it is "a two to one proportion", "a numerical proportion", or even, simply, "a proportion". But just as "art in general" does not produce health, nor in fact anything at all, neither does "proportion" in general constitute an octave. Although such causes are called general and universal, as such they are not causes at all, but no more than common attributes of a particular cause. Such universality we call community of attribution or predication. Of course, every octave is a numerical proportion, but so long as we know it only as a numerical proportion we do not know it as an octave. ~~To say~~ To posit a good definition we must assign the proximate genus. To say

that a horse is an "animal", or even a "four-legged mammal" is true, but not enough to describe it as a horse and distinguish it from a mouse. Every animal is an animal, but no animal is just animal, not even the one who is almost non-animal.

> 3. This particular division of cause into prior and posterior is easily misunderstood, especially by people inclined to drift outright into metaphysics. In fact, we are sometimes prompted to believe that the freedom of metaphysics is achieved by withdrawing into the general fog of being; as if from the intuitive height of this confusion, we might, unhampered by bodies, plants, or whatever natural things, give full rein to creative thought and, knowing nothing in particular, yet preside over all. Attemps have been made to deduce all of Metaphysics from the sole principle of contradiction, as if anything could be deduced from it at all. One such thinker (of whom the gentle Aquinas said that he reasoned "most stupidly"), by applying that method, arrived at the conclusion that God and first matter were one and the same.
>
> To forestall any such confusion we must point out here the radical difference between a cause that is universal in predication only, as those mentioned above, and a cause which is universal in causation. We shall call the latter, briefly, universal cause. It is not our aim to demonstrate in full, at this juncture, that there is such a reality as a universal cause. Our sole purpose here is to point out that the universal in predication should not be expected to yield what is proper to a universal in causation. However, this requires the support of some argument or other. The digression should prove useful inasmuch as it is precisely the later Scholastics' neglect of this type of cause which makes them so helpless in the face of certain major problems raised by the findings and hypotheses of experimental science. What a universal cause is can be shown by an argument similar to the one already used in proving that nothing can become per se out of what is. (I, 14, n. 6)
>
> Let us note, first of all, that a predicate is called universal in two ways:
>
> (a) Something is called universal as <u>predicable</u> when it bespeaks a relation to inferiors, i.e. subjected parts, of which it is said with identity though

without adequation, such as "animal" is said of both man and beast, or "man" of both Socrates and Plato. There is, here, identity without adequation. Identity, because man is an animal, and Socrates is a man; but no adequation, because "to be an animal" is not the same as "to be a man", since beast, too, is animal. This universal is the dici de omni, or universale in praedicando, sometimes called universale inessendo, i.e. "by being in the many of which it is said". For no animal is just animal, but always of this or that kind, and not convertible with any one kind. ("Animal", however, is sometimes used as a specific name for "irational animal".) This universal inessendo should not be confused with the universal in essendo in the sense of "universal in being".

(b) Then there is the universal predicate which refers adequately to a subject. This universal is not at all the "predicable universal"; it is the universal predicate of a demonstration made from "what" a thing is, such as when we show from "what the triangle is" that "the three angles of any triangle are equal to two right angles". This universal predicate does not belong primarily and immediately to the subjected parts as parts, for while it is true of every kind of triangle, it is not proper to any one kind.

Now the latter universality is also true of the effects referred to the same cause, when this cause cannot be identified with any or all of the effects. Before giving an example, let us state the general reason: when one and the same thing, e.g. A, can be predicated of B and C, neither B nor C being the cause of C as A or of B as A, then there must be a distinct cause of B and C inasmuch as they are A, which they have in common; otherwise, B and C would have to be not only cause one of the other inasmuch as both are A, but B would have to be cause both of C and of itself, or C of B and of itself.

For instance, Socrates is a cause of this man, his son, Socrates Junior. Now, many same things can be said of either, such as "rational", "animal", "living", "a being". In each of both, though quite distinct individuals, there must be that by reason of which this one same thing may be said of either, and because of which they are of this or that kind. Now Socrates, while he is surely the cause of Junior's being this man, could hardly be the per se cause of that by reason of which Junior is a "man", since in Socrates himself there must be the same "that by reason of which" he too is a man. For to say, of Socrates, "this is a man", is not the same

as to say "this is Socrates", or "this man is Socrates", unless Socrates were the only man possible, and man his proper name. Hence, the word "man", in "Socrates is a man", and the word "man", in "Socrates Junior is a man", are either the same word signifying the same nature in both, or they are one only as a word, signifying natures different in kind, as man and circle. If the latter were true, the word "man", as used in this context, would be an equivocal term, such as "dog" meaning this kind of animal, and the same word "Dog" used to signify a particular constellation of stars. But if the name "man" is univocal (the same would hold for an analogical name), Socrates cannot be the per se cause of his son as to that by reason of which his son is a man. He could be such a cause only if he were the cause of his own being "a man", in the way in which he may be the cause of his own being "a musician". But this would mean that he is the cause of what it is to be a man, and therefore the cause of human kind itself; and thus he would be the cause both of his own being a man and of his own being <u>this</u> man. For no one can be a man without being a <u>this</u> man, no more than <u>this</u> man can "be" without being a man. In other words, no man can possibly be the cause of any <u>this</u> man's being a man.

The per se efficient cause of every <u>this</u> man's being a man is a universal cause as opposed to a particular one such as Socrates. And since a universal cause must be a cause of a being whose nature is different from its own, it is an equivocal cause. It is called "equivocal", not in the sense that its name is equivocal, but because its effect differs in kind from the nature of its cause.

The same argument can be used with regard to being, which is what everything has in common with everything else. For, "to be" is said, although not univocally, of everything that is. For the same reason, there must be a universal cause of all that exists, but which, itself, has no cause. And this cause is termed <u>universalissima</u>, i.e. the cause above all causes, universal or particular, none of which can extend to all that their effect is.

If the universality of every such cause were reducible to the generality of a common predicable such as "animal"; if "to be predicated as the cause of many" were the same as "to be predicated of many", a universal cause would be a general, confused cause, such as the genus "art" compared to "medicine", the latter being only one kind of art; and <u>this</u> effect, e.g. the health of Socrates, would itself be something general and confused, quite in the manner according to which it is known, that is, only as "an effect of art", and

not as the achievement of a particular kind of art, viz. medicine. Such general knowledge alone would not allow us to distinguish "the health of this man" from "this shoe". Yet, many philosophers have confused these two types of universality; and others have considered the effect of the universal cause in the sole light of the community which is expressed by the common predicable, as if "animal" were both general, and yet one real, distinct part of man, to which is added another real and distinct part, viz. "rational".

Note here that Plato combined the two types of universality into a single cause. He argued as if from the fact that Socrates cannot be the per se cause of the reality that this son of his is "a man", above all men there must be "man", the proper and universal cause of every particular man such as Socrates, Plato, etc. In other words, he converted the predicable universal into a universal cause, confusing the manner in which things are in our mind with the manner in which they are in reality.

Others, as we mentioned, plainly extend the confusion to the effect itself. When we say that a universal cause is the cause of this man's being "a man", they attribute to the effect itself the indetermination of the predicable universal "man". They understand the universal cause produces something general in this thing, something determinable which will be this kind of thing, and this thing, thanks to a less universal, or to particular cause. According to this opinion, when Socrates generates this son of his, the most universal cause produces the latter's being "in general"; at the same time, that cause or another less universal one, produces this son's "being a body", but again "in general"; and so on, until after "live body in general", we have "animal" and, finally, "man" in general. But it is, to their mind, the ultimate particular cause, Socrates, and he alone, who is responsible for his son's being determinately this being, this body, this living body, this animal, inasmuch as, by determining all the generalities, he is the proper cause of this individual.

That this is an altogether too material interpretation can be shown most readily in the case of the universal cause of being. For this man, "to be a man", is also "to be"; his "being" is not something separate from his "being a man", both of which refer to a universal cause; nor are they separate from "to be this man", for all are this same man. The universal cause produces this being who is Socrates Junior, this man who is the same Socrates Junior. This individual man is not a being, nor a man, apart from being Socrates Junior. In other words, the fact that Socrates

> is the particular cause of <u>this</u> man, does not mean that he is the only cause of his son as <u>this</u> man. The cause that is universal <u>in essendo</u> is cause of all that Socrates is cause of. The difference is that, on the one hand, Socrates is no more than the cause of this man as this man and, on the other, while that universal cause is even more so cause of <u>this</u> man, the nature of the latter is not assimilated in kind to the nature of the universal cause, which, nevertheless, brings about <u>this</u> effect and operates far more intimately, without any confusion whatsoever, than the most particular of causes.
>
> Furthermore, if the most universal cause were not cause of its effects as to their difference in kind and of their being <u>this</u> particular thing, then, that <u>this</u> thing is of one kind, and <u>that</u> of another would, as far as that universal cause is concerned, be purely incidental; things in their difference and in their individuality would have, as per se cause, only the cause, or causes, intermediate between the "universal cause <u>in essendo</u>", and the individual effect. — And the same would hold if there were no single universal per se cause of both Socrates' and Socrates Junior's "being a man", and of their each being a "<u>this</u> man": that both are subject of common predicates would be no more than a purely incidental fact, without any per se cause whatsoever. All individuals of one kind would be so per accidens, and science, therefore, as well as its application to individuals, would be impossible.

4. Besides the per se causes, there are also incidental causes. And these can be divided parallel to the <u>genera</u> of per se causes. As regards material cause, that a table be made of wood, or of this particular kind of wood, of iron, or of iron of this kind, is incidental, although it is not so to a wooden table, nor to a wooden table of this kind of wood. Polycletus is an incidental cause of the statue, whereas "sculptor" is its per se cause. The reason for this distinction is that Polycletus is cause of the statue inasmuch as he happens to be a sculptor. The same holds of whatever generality contains Polycletus, such as "man", or "animal". We could say "this man", or even "this

animal" is cause of the statue. But in doing so we assign a merely incidental cause.

> Note the difference between a common per se cause and a common incidental cause. "Art", common in predication only, was mentioned as an instance of a per se cause of health; it was called prior in the sense of "more common", as "animal" is more common than "man", and "man" common to this and that man. Medical art is a particular per se cause of healing. But what, then, is the difference between the generality "art", as a per se cause of health, and the generalities "animal" and "man", which are called incidental causes of the statue, when every kind of art is an art, every sculptor a man, and every man an animal? Yet there is a marked difference. For though on the one hand every sculptor is a man, and an animal, in the sense that it is of the nature of the one who possesses such art, to be a man, and man is animal, just as any particular kind of art is an art; and though one can very well be a man without being a sculptor, just as one may be an artist without being a flute-player, it remains true, on the other hand, that one may be a man without being an artist of any kind. For art is merely conjoined to man. And although it is natural that man be inclined to art and in fact needs its works, he does not actually possess an art by the mere fact that he has the nature of man, in the manner in which he has reason, whether he uses it or no. In this sense, the fact that a man is a doctor, a shoemaker, a flute-player, or a plumber, is incidental to man or to animal as such, while he may by nature be more apt to acquire this kind of art rather than that kind of craft — something which is not always heeded in practice, as when a person who might have made a good plumber becomes an awkward doctor.

Now the second division of causes according to their modes. From the above example it is plain that some incidental causes are nearer to per se causes than others are. For incidental cause is said of anything which is merely conjoined to a per se cause and does not belong to the very nature of this cause. Yet, that which is conjoined to a per se cause may be more or less remote from what has the proper nature of cause. For instance, if the sculptor is a pale man and also a musician, the art of the musician being in the same proximate subject as that of sculpture,

namely in the mind (although not without some manual dexterity), to be a musician is closer to being a sculptor than to being pale, which affects the body. But in the same example, the very subject of the art, namely Polycletus, is, of all that is incidental to being a sculptor, the closest; more so than "pale" or "musician", since they are conjoined to "sculptor" only by reason of their subject, viz. Polycletus.

5. Now a third division. Besides the causes properly so-called, viz. both per se and accidental causes, some are called potential, i.e. causes which <u>can</u> operate without doing so; some are called actual, i.e. causes which are actually in the state of operation. The builder may be called a cause of building a house, either because he knows how to build one although he is not building one now, or because he is actually building one.

> The importance of this division which, in the opinion of many is too obvious to be relevant or worthy of consideration, will be shown further on in this same lesson.

6. Having distinguished the causes according to the foregoing modes, we must now distinguish, in a similar way, those things of which they are the causes. For what is caused is on the hand something posterior and more proper and, on the other, something prior and more common. We say, for instance, that something is the cause of <u>this</u> statue, but we also say that something is the cause of "a statue", which may be said of any particular statue; and we indicate something even more common when we refer to the statue as an image or imitation, which, of

course,it is. Just as one may be called the moving cause of "this bronze", of "bronze", or of the "material" of the statue, generally.

Now the same can be said of incidental effects, viz. that some are more common, and some less. Yet both are the same thing, such as Socrates Junior, who is this son, this man, this mammal, this biped, this live being, this body, this being.

By an incidental effect is meant something which though conjoined to a per se effect, does not belong to or follow from the nature of this per se effect. For instance, the per se effect to be expected from a cook is tasty food, not food that restores health. It is the doctor, who prescribes, per se, health-restoring food; but when it happens to be tasty as well, this is incidental.

4. There is a fourth and final division of causes according to their modes, namely into simple and composite. For "cause" may be said either of the per se cause and the incidental cause taken separately one from the other, as when we say that Polycletus is cause of the statue, which is incidental; or, that the sculptor is cause of the statue, namely per se. This indicates a so-called simple cause, whether it be per se or incidental. But we may also signify in a complex way and as a composite both per se and incidental cause taken together, as in: "'The sculptor Polycletus' made the statue".

> There is still another sense in which a cause is called composite, as when several causes of the same kind concur in producing some effect that is one, e.g. the ensemble of several people pushing along the same cart, or the many bricks that make up a wall. However, such composite causes do not fit into the present division, since no simple component of such a cause is the cause itself, but only part of a cause.

(9)

8. All these various modes can be reduced to six in number. For a cause, as to its mode, i.e. compared to its effect, means either: - (1) something particular, or (2) something general; - something incidental, either (3) particular or (4) general; - (5) some complex of causes, or (6) each cause by itself. And each of these six modes is divided into cause in potency and cause in act. This further distinction, which affects each mode and thus brings their total to twelve, is to the point, for what is in potency cannot be said "to be absolutely".

9. The foregoing distinction of modes allows us to point out three things that are consequent upon it:

The first is a difference to be noted between causes which are in the act of causing, and those which are not: the former exist and cease to exist simultaneously with what they are the cause of provided, of course, that by a cause in act we mean a "singular", i.e. a proper, particular cause, such as this healing person, who is simultaneously, as a cause actually healing, with the person in the course of being healed by him, and ceases to be an actually healing person once that sick person is actually healed; just as this builder, while actually building, is simultaneous with the house in its course of being built. But this is true neither of a general cause, even in its state of causing, nor of a cause that is not in the state of causing. For a builder may be in the course of building, without being in the course of building this house, but some other house. But when we consider the builder as building this house, it is necessary that when the one is posited, the other, too,

be posited; and when the cause ceases to cause, what he causes ceases to be in the state of being caused. But this does not apply to a cause that is in potency, i.e. which is not in the state of causing, for the destruction of the house does not simultaneously destroy the one who built it.

From this it is plain that inferior agents, such as the father of Socrates Junior, who is only the cause of his son's having become this man, must exist simultaneously with his son while the latter is actually being caused and becoming this man. But once his son has become, Socrates ceases to be, in this respect at least, an actual cause. That his son exists in act must be referred to the cause of what exists as existing in act, i.e. to the cause which is universal in essĕndo, and which must cause, and exist with, whatever is. So that if the actual causing of this universal agent were withdrawn from whatever exists, everything that is, owing, as it does, its existence to this cause, would cease to be everything that it is and no longer exist at all.

10. The second consequence is that in natural things we must always enquire after the first cause, which is the most exact and proper, just as we do in any given order of things such as that of a certain kind of artifact. For instance, a man builds because he is a builder, and not just because he is an artisan, or a man. By reason of what is he a builder? Because of the art of building which is his, and which the flute-player, e.g., does not possess qua flute-player. Such is the first cause in this order. And we should try to do the same in studying

nature, viz. proceed towards the exact and proper reason. Why does the moon follow such a course? Whence the tides? Why does a car, making a sharp turn at a certain rate of speed, tip over? Until we see the exact and proper reason why these things happen as they do, we do not really know them even as effects except in a way that is confused. We know them first as effects because they are not self-explanatory. And though we may be certain that something must have a determinate cause without knowing what this cause is, except in the logical fashion implied in the question "what is the cause of this?", we do not know the effect as a proper effect until we know its proper cause. And if this cause of that effect is not its own explanation, the cause itself is, in turn, the effect of some other cause, and until this latter cause is known, that effect will not be known in its own nature of effect until its first and most proper cause can be assigned.

> The first cause is sometimes called "supreme", and "prior". Now, as we have seen, "prior cause" may mean the most general in predication, as in "art the cause of health"; and this universality is of course supreme in the order of predication. But such a cause is not prior and supreme in the present context. If it were, the perfection of science would be found in the utmost confusion, and scientific knowledge of a thing by its first and supreme causes would be knowledge of it by what is most confused. If that were true, the limit of knowledge of what an elephant is would be to know that he is an animal, brought forth by a living being or, better still, by a cause; and even more "profoundly", that he is a body, indeed, a being; whereas to know that he is a four-legged mammal of considerable size, equipped, furthermore, with a trunk, would be knowledge of a lower kind. But this is too obviously silly. Yet that is what some scientists believe to be the claims of Philosophy, a belief which is not without some reason. After all, Hegel did believe that the particular proceeds from the general, and whatever is general, from what is most general of all, viz. "being in general", considered

by him, as a genus; indeed, the supreme genus, interpreted, furthermore, as self-contradictory, inasmuch as "being in general" is no being in particular, and therefore, he concludes it implies at the same time the negation of every kind of being. This contradiction, he held, resolves itself into the lesser generality that is "becoming in general". But "becoming", in all its generality, is the negation of all particular becoming, which is again a contradiction to be resolved, in which every becoming owes its becoming to the contradiction of what is most general becoming. And so on, presumably down to the becoming of "elephant in general", which again is no particular kind of elephant at all; this contradiction would be resolved into "African elephant" in general, and in the end we should be faced with this elephant we see in this circus, whose self-contradiction is a particular one of life itself, to be resolved in this elephant by his death. Actually, this method has shot all elephants before they could ever be, or before they could even be possible.

In the Marxist inversion of this method we fare no better. For, while Hegel's method is turned upside down "back on its feet", to identify "being" with "matter", the eternal contradiction of matter with itself is resolved into self-contradictory movement; an identical process of unending negation and negation of negation finally rouses self-negating elephants and men to be resolved by death; the same murderous farce begins over and over somewhere else, each time to end where "nothing is but what is not".

But there is still another reason why some are led to believe that Philosophy is the cult of confusion, and a far more subtle reason too. The Scholastics themselves may be in part responsible for this inasmuch as they do not make plain the distinction between being, on the one hand, inasmuch as it is the first known and most common, most indeterminate predicate of all predicates, and, on the other hand, being as the subject of First Philosophy which defines, whatever it defines, without sensible or intelligible matter. It is, then, a very different matter (a) to know that the elephant is a being, (b) to know him as a being, which is to know nothing at all of the elephant as such, and, (c) to know what kind of being the elephant is as an elephant; and this is the office of natural science. No other knowledge of elephants as elephants can replace it, but must always depend upon it; and the same holds for man as man, since as man he cannot be conceived without sensible matter. A "Metaphysics of man as man" is simply impossible. What kind of knowledge of elephant or of man would be complete, will be pointed out in Lessons X and XI.

> The main point to be made here is that the expressions "first cause", "ultimate cause", "supreme cause", "remote cause", "proximate cause", "universal cause", and "particular cause" are all ambiguous when taken out of context. They should be interpreted, now as related to what is first and better known to us, then with reference to what has in itself most of all the nature of "that from which things depend in their own being or in their becoming", or from whose knowledge things are most exactly known as to what they are in themselves.

11. The third consequence to be shown is that in assigning causes to effects we must observe their proportion, so that generic effects be assigned to generic causes, and particular effects to particular causes. As when we say that the cause of a statue is a sculptor, and of this statue, this sculptor. Likewise, to causes which are not in the act of causing we should assign effects which they may cause; and to causes in act, effects in act.

Lesson VII

DIVERSE OPINIONS ON FORTUNE AND CHANCE

1. Fortune and chance are reckoned among causes.

In a general introduction to the study of nature, such as this, we must take account of all causes that bring something about in nature. Now besides the causes already mentioned, there is still another kind whose role some philosophers denied, whereas others made it the cause of the universe itself inasmuch as they saw in chance or fortune the hidden, irrational origin and ultimate explanation of the most orderly phenomena in nature. But such a cause, real as it may be, can it be a natural cause and a principle of science? It seems that what people call 'fortune' and 'chance' are in themselves obscure, "unmanifest causes", and that nothing can be deduced from them. However that may be, they are reckoned among causes. For many things are said both to be and to come to be as a result of fortune or chance.

> But since, as we shall see in the course of the next three lessons, fortune, unlike that mere chance which may be found in nature, is in the sphere of practical life -- pertaining as it does to human actions, for good or for harm -- why then should we treat of both fortune and chance in an introduction to the study of nature? A.v., when our endeavour is to know whether there is such a thing as chance in nature, why spend so much space and time on an enquiry as to what fortune is? The reason has already been stated: we must go from what is better to what is less known to us. Fortune being more familiar, better known to us than that type of chance which may occur in the events of nature, we emphasize primarily fortune, yet only as a means of showing what kind of chance there is, if any, in nature.

> For in trying to establish the type of accidental cause that fortune and chance are, it would not be wise to examine first of all the case that is least known and most debatable. If we took the latter as the starting-point, even the problem concerning its own distinct kind of causality could not be raised in proper terms. What fortune and chance have in common, in what they differ, and why at one time 'chance' and at another 'fortune' are used as generic terms, we shall see in Lesson X.

Everyone seems to admit that it would be most unfair to hold a person responsible for whatever may happen to him by what is called misfortune, or to hold us to account for whatever good or bad luck may be the lot of our neighbor as some unintended and inadvertant result of a particular action of our own. The reality of fortune and chance is recognized in courts of justice, as when some accidents are called "acts of God".

Jocasta warned, in Sophocles' Oedipus Rex, a play especially devoted to the wiles of fortune, and which has been called the finest of Greek tragedies:

> Chance rules our lives, and the future is all unknown.
> Best live as best we may, from day to day.

No man can gird himself against "That strumpet Fortune",

> "And giddy Fortune's furious fickle wheel,
> "That goddess blind,
> "That stands upon the rolling restless stone..."

All are inevitably exposed to fortune, now kindly, then cruel. Its hidden meaningfulness takes on the shape of fate. Not that fate reduces fortune to inherent necessity,(1) but because

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(1) In Greek poetry fate or destiny does not deny fortune, nor fortune fate. The accent, however, was mainly on the inevitable character of fickle fortune. It is the Stoics who will interpret the infallibility of fate as the denial of fortune. It is for this historical reason that in Philosophy, as well as in Theology, we avoid the word fate,

on the one hand no one can escape some thing or other from happening to him by chance no more than he can escape from being what he is, whereas on the other, even "Fortune's furious fickle wheel" can bring forth nothing that is not already "spoken" (fari, fatum, i.e. what has been said). Fate is beyond, but does not erace fortune. It is from fate that fortune has its meaning, not from itself. But as for fate, the Iliad says,

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lest the reader believe we accept the kind of necessity it sometimes stands for. Yet Virgil did use it in an acceptable way. In a broadcast from London (September 9, 1951) Mr. T.S. Eliot said of Virgil and Destiny, and we must approve: "Fatum is a word which constantly recurs in the Aeneid; a word charged with meaning, and perhaps with more meaning than Virgil himself knew. Our nearest word is 'destiny', and that is a word which means more than we can find any definitions for. It is a word which can have no meaning in a mechanical universe: if that which is wound up must run down, what destiny is there in that? Destiny is not necessitarianism, and it is not caprice: it is something essentially meaningful. Each man has his destiny, though some men are undoubtedly 'men of destiny' in a sense in which most men are not; and Aeneas is egregiously a man of destiny, since upon him the future of the Western World depends. But this is an election which cannot be explained, a burden and responsibility rather than a reason for self-glorification. It merely happens to one man and not to others, to have the gifts necessary in some profound crisis, but he can take no credit to himself for the gifts and the responsibility assigned to him. Some men have had a deep conviction of their destiny, and in that conviction have prospered; but when they cease to act as an instrument, and think of themselves as the active source of what they do, their pride is punished by disaster. Aeneas is a man guided by the deepest conviction of destiny, but he is a humble man who knows that this destiny is something not to be desired and not to be avoided. Of what power is he the servant? Not of the gods, who are themselves merely instruments, and sometimes rebellious ones. The concept of destiny leaves us with a mystery, but it is a mystery not contrary to reason, for it implies that the world, and the course of human history, have meaning". Selected Prose, edited by John Hayward, Penguin Books, n. 873, p. 96.

"... I think that no man yet has escaped it
Once it has taken its first form, neither brave man nor coward".
[VI, 8-9]

The ominous things that fortune may have in store are in the "Book of Fate":

"O God! that one might read the book of fate,
And see the revolution of the times
Make mountains level, and the continent, —
Weary of solid firmness, — melt itself
Into the sea! and, other times, to see
The beachy girdle of the ocean
Too wide for Neptune's hips; how chances mock,
And changes fill the cup of alteration
With divers liquors! O! if this were seen,
The happiest youth, viewing his progress through,
What perils past, what crosses to ensue,
Would shut the book, and sit him down and die". (2)

Thus Hamlet ponders

"Whether 'tis nobler in the mind to suffer
The slings and arrows of outrageous fortune,
Or to take arms against a sea of troubles,
And by opposing end them? To die: to sleep;
No more; and, by a sleep to say we end
The heart-ache and the thousand natural shocks
That flesh is heir to, 'tis a consummation
Devoutly to be wish'd".

It is mainly to what is called Fortune that we ascribe what happens to man by chance. This is so widely recognized that ~~great~~ literature presumes it is known by all, as in the following passage from As you like it:

"Celia. Let us sit and mock the good housewife Fortune from her wheel, that her gifts may henceforth be bestowed equally.

Rosalind. I would we could do so; for her benefits are mightily misplaced; and the bountiful blind woman doth most mistake in her gifts to women.

Celia. 'Tis true; for those that she makes fair she scarce makes honest; and those that she makes honest she makes very ill-favouredly.

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(2) The Second Part of Henry the Fourth, Act III, scene I.

Rosalind. Nay, now thou goest from Fortune's office to Nature's: Fortune reigns in gifts of the world, not in the lineaments of Nature.

Celia. No? when Nature hath made a fair creature, may she not by Fortune fall into the fire? Though Nature hath given us wit to flout at Fortune, hath not Fortune sent in this fool [Touchstone, the clown] to cut off the argument?

Rosalind. Indeed, there is Fortune too hard for Nature, when Fortune makes Nature's natural the cutter-off of Nature's wit.

Celia. Peradventure this is not Fortune's work neither, but Nature's; who, perceiving our natural wits too dull to reason of such goddesses, hath sent this natural for our whetstone; for always the dulness of the fool is the whetstone of the wits".

> The Stoics, on the whole, denied the intrinsic irrationality of chance, believing as they did that if only we could see things in the light of all the causes that are part of the universe we would see that there is no such thing as a contingent effect. Boethius, on the contrary, saw the reality of fortune and described its whims at great length in his work On the Consolation of Philosophy. In later Scholasticism, Aristotle's teaching on chance in the works of nature was declared impious. Spinoza, in his treatise On Human Servitude, saw in fortune, whose reality he denied, the ultimate and proper cause of the human person's enslavement. So that even when not accepted as a real cause, it may admittedly entail real results. Hegel seems to have designed his whole philosophy with the intent to banish the irrationality of the contingent from human affairs. "What irks and infuriates us is not what is, but the fact that it is not as it should be; once we know that it is as it must be — that is to say, not arbitrary or contingent —, we also recognize that it should be as it is". And some who are called "existentialists" despair in helpless, though not silent, revolt against existence because, they say, "everything is contingent", and all is out of hand. They might even quote Ecclesiastes: I turned me to another thing; and I saw that under the sun, the race is not to the swift, nor the battle to the strong, nor bread to the wise, nor riches to the learned, nor favour to the skilful: but time and chance in all. [IX, 11] Nothing enrages the Marxist as much as ~~the~~ belief in the reality of chance and fortune.

Now that we have seen that fortune or chance are at least mentioned as a cause, we will consider three things: (a) in what manner fortune and chance are present among the causes enumerated; (b) whether fortune and chance are the same or different; (c) what chance and fortune are.

2. Some deny the reality of fortune and chance.

Some people question whether fortune and chance are real, and, in fact, a large number of philosophers reduce them to appearance, relegating them to the anthropomorphism of that recent invention: "la pensée pré-logique". Others, on the contrary, see chance in all. It is noteworthy that in acknowledging the reality of fortune the poets have preceded the philosophers. No tragedy can be conceived without it — and little wonder since, as we shall see later in this lesson, popular opinion has always recognized the workings of chance.

The reasons offered as the ground for denying the reality of fortune and chance as causes are twofold. The first is that upon closer examination, whatever was said to be due to fortune or to chance turns out to have some determinate cause, and therefore not the kind of cause that was conveyed by the name 'fortune'. Here is an example: Suppose a man goes to the market with the intent to buy fresh vegetables, and there runs into a person whom all the while he had wanted to see — let this person be a debtor — but whom he had not at all expected to meet on this occasion. This is what is called a chance-meeting, a fortuitous encounter; a lucky

one to the creditor, perhaps unlucky to the debtor. No mysterious cause is at work here, one might say, but rather a cause that is determinate and clear: the encounter is the result of the creditor's deliberate will to buy vegetables in the market, and because of this conscious intention he came to the place where he found his debtor.

The history of Philosophy proves how difficult it is to dissuade one who feels unreasonably clear about what is most obscure. Once a person is convinced that the above reduction is satisfactory as an explanation of what fortune or chance is, there is little that can be done about it and one might as well forget him, or at least change the subject. In every case ascribed to fortune, they say, it is always possible to find a determinate cause which accounts for the fortuitous without any recourse to the obscure cause that fortune is held to be. Fortune, therefore, turns out to be a cause of nothing at all; from which it follows that fortune itself is nothing at all, since we posited fortune only inasmuch as we thought and said that some things come to be by fortune.

3. <u>A further reason why fortune may be nothing at all: the earlier natural philosophers did not investigate fortune or chance</u>.

The <u>second</u> reason why fortune may seem to be nothing real is the historical fact that none of the natural philoso-

phers of old in speaking of the causes of generation and decay took account of fortune; whence it would seem that neither did they believe that anything comes from fortune.

4. Yet they ascribed some things to fortune.

But the matter is not as simple as that. It is indeed surprising that the ancient philosophers in question should have taught nothing determinate on this subject, when their obvious intent was to account for all the causes of whatever becomes. Now many things both come to be and are by fortune and chance. And it is true enough that in each and every instance some determinate cause is involved, as we saw in the reason brought forth against the reality of fortune. But the whole point is that notwithstanding the reduction to an obvious, determinate cause, those same philosophers continued to ascribe some of these things to chance or fortune. And so we could expect them to have said something about these causes, if only to show why it is not true that some things come about by fortune or chance; and they might have assigned a reason why some things are said to be by fortune, and others not. Now if fortune and chance could simply be reduced to any one or all of the determinate causes posited by them, it cannot even be said, in excuse of their omission, that these natural philosophers identified fortune with any one or all of those causes which they named and taught as real, such as love, strife, mind, fire, or the like.