NATURE AND CHANGE IN ARISTOTLE'S *PHYSICS* BOOKS I AND II

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To the memory of my father

and to my mother

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Abbreviations

Cat.	*Categories*
Cael.	*De Caelo*
De An.	*De Anima*
Gen. Corr.	*De Generatione et corruptione*
E.E.	*Eudemian Ethics*
Hist. An.	*Historia Animalium*
Phy.	*Physics*
Met.	*Metaphysics*
N.E.	*Nicomachean Ethics*

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Introduction

Aristotle has no doubt that 'change' is the most characteristic mark among the natural phenomena that we can observe about us. As against the scepticism derived from Humean extreme empiricism, Aristotle believes that knowledge is still possible since we who are furnished with reason can observe these phenomena of change, such as day coming after night, a seed becoming a plant, a child becoming an adult, and the like. In effect, the question why or how these phenomena occur always interests us and it might be natural human desire to ask questions as to such events themselves and to endeavour to explicate the course of change from the beginning to the end. Although Aristotle was not the first philosopher who was interested in the phenomena he deserves to be called the first in the sense that he was the first to attempt to analyse and explain them systematically. In one of Aristotle's main writings, the *Physics* which is regarded as dealing with the science of nature, he concentrates in particular on analysing such phenomena and other related problems.

At first sight, the notion of change which we come to have seems unproblematic since, as stated, there are numerous phenomena which we can take as examples to explain it. However, when we take one step further to enquire into the phenomena we soon find that it is not so simple a notion. Except for the fact that there are such phenomena which can be called change, no question with reference to the notion can be easily answered; for instance, how can we have the notion of change? or where does change begin? or how can there be change? or the like.

Let us take as an example the question of why we do not always think that a thing that exists at one time ceases to exist and a new thing comes into existence at a different time, but think that it is the same subject as it was at another time? For example, when cold wax becomes hot we say the wax continues to exist, though, as Descartes pointed out, everything given to the senses differs. Why? The answer to

the question might be that we have a certain capacity to intuit the continuity thorough change, to identify pertinently a thing at one time as the same thing at another time despite its changed appearance. Evans suggests that it presupposes a certain mechanism of change.

> If you are looking at this book one moment and a moment later see a plate of curry where the book was, we would describe this as a case in which a book was replaced by curry but not one in which a book changed into curry, ... if we have no idea what sort of mechanism this could be, we will not accept that there is any thing which has changed ...[1]

Evans's answer is that we are, at least, capable of knowing that a book cannot change into curry. Of course, he would not suggest that we are able to understand the mechanism of all change in nature. On the other hand, Aristotle's answer to the question is, according to Martin, that "there is a subject and two termini of change."[2] It is plain that there must be a subject which persists throughout the change as well as the human capability to recognise it. That is, if there were nothing that persists throughout change we would not be entitled to claim that this thing here at the moment is the same as the thing there at another time.

Aristotle says that change is from 'something' to 'something else', or 'something different' (*Phy.* 189b33-34) and presupposes a persistent subject (190a16). This statement suggests that there are two types of change: That is, 'from something to something else' designates substantial change, 'coming-to-be' and 'passing-away' and 'from something to something different' non-substantial change, alteration.[3] As for the former type of change there seems to be no clear subject that persists the change, e.g. a tadpole's becoming a frog. On the other hand, as for the latter there is clearly a subject in the change; that is, a man is a subject in the example of his

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1 J.D.G. Evans, *Aristotle* (Sussex: The Harvest Press, New York: ST. Martin's Press, 1987), p. 15.
2 C. Martin, *The Philosophy of St. Thomas Aquinas* (London: Routledge, 1988), p. 59.
3 B.A. Brody, *Identity and Essence* (Princeton & New Jersey: Princeton University Press, 1980), pp. 71-73.

losing an arm. With reference to these types of changes, Aristotle therefore suggests in the *Physics* in I.1 that a natural process of our questions related to the notion of change should not stop at the place where we can experience certain things, i.e. knowing that a book cannot change into curry, or that there are two termini of change, or the immediate subject which persists throughout non-substantial change, but goes further to enquire into the area where there are unobservable conditions, i.e. what is the mechanism, or what are the sources of change, or what is the subject which persists throughout substantial change.

Aristotle's basic assumptions concerning change in the *Physics* are obviously based on his belief in our ordinary experience but it should be noted that they are indeed taken for granted in order to search for more general sources of change, such as potentiality, nature, and the like. These assumptions are in effect the beginning of our inquiry and therefore, it is reasonable, I believe, for Aristotle to claim that such an inquiry should start from sensory observations which we, humans, generally have in common. As pertinently emphasised, for Aristotle our senses or experiences need not be examined for the time being, although they might be examined later on. That is, to question how it is possible for us to experience so and so, for example, is a later step.

The aim of this research is to come to a deeper understanding of Aristotle's theory of change based on our ordinary experience by finding out what are the preconditions and the real sources of change of beings in his philosophy. To understand this we will have to deal with much of Aristotle's philosophy. For, as stated, change is not only related to observable phenomena but to diverse principles, such as privation, potentiality, nature, and essence. However, this research primarily focus on the *Physics* Books I and II. For in these two books Aristotle endeavours to answer the questions following the process of change from the beginning to the end, such as how change is possible, what is the beginning of change, what is the source of change, what is the change of beings for, and the like.

In chapter I, I will begin our discussion by examining Aristotle's initial claim that there is change in nature and his objection to the Presocratics concerning the problem of the number of the first principles and whether *what is* comes into existence from *what is* or from *what is not*. Unless these problems are properly answered Aristotle is not entitled to claim that there is change in nature.

Chapter II presents Aristotle's conception of the genesis of beings and of change. Aristotle conceives that a pair of contraries is the first principle which is the beginning of many beings. In considering Aristotle's objection to the number of the Presocratics' principles, we are required to examine how he understands theirs, and what are his own principles. And in order to understand the questions at issue we should indeed enquire into what is Aristotle's analysis of change.

Given the possibility of change, chapter III will be focused on what the changeable substances are and what is it that is capable of changing. For Aristotle, it is not the case that everything is capable of changing. Beings which are in a state of privation and which possess the potentiality of being acted on corresponding to a potentiality of acting are capable of changing. In examining the problem of change the notion of potentiality is a crucial principle involved in changeable beings, for change is, according to Aristotle, the actualisation of what is potential as potential (201a10-18). At this stage Aristotle's other work *Metaphysics* will be the main source of our discussion.

Chapter IV is about the question whether whatever changes changes by itself or by something else. Nature, says Aristotle, is a source of movement or rest which is present within a thing itself (192b24-25). If we are to comprehend Aristotle's theory of change we must see what are the characteristics of nature as well as of potentiality.

Finally, in chapter V, I will focus on what Aristotle means by 'for the sake of something', which is a final stage of his analysis of change, and whether or how Aristotle is successful in defending his teleology against the objection that it seems to entail treating all the movements of natural beings as planned. In this work, I will

on the whole endeavour to answer the questions raised in the course of Aristotle's reasoning from the beginning to the end of change. However, where there is not enough space to deal with a question or when it is not directly related to the question at issue I will have to leave it unanswered.

Chapter I

Aristotle's Criticisms of the Presocratic Principles

Aristotle's disagreement with his forerunners' theories about the first principle, which is generally defined as a beginning, out of which many things come, mainly rests on two points: (1) that none of them properly cope with the number of first principles and (2) that they draw wrong conclusions from wrong assumptions.

> ... for example, the arguments of both Melissus and Parmenides, which conclude wrongly from false premises; or rather especially the argument of Melissus, which from a single absurdity simply deduces the rest with no grace or effort. (*Phy*. 185a9-12; 186a 7-10)

For this reason, Aristotle in the first book of the *Physics* devotes himself to analysing and examining their assumptions. It is therefore worth examining why and in what sense he thinks his predecessors' assumptions are wrong and how he can settle their difficulties. Firstly, therefore I will show what Aristotle's assumptions are, although this thesis is very common and well known, since it is the grounds for his assertions which are dealt with in this dissertation; then I will examine whether Aristotle's objection to the Presocratic assumptions is sound.

I will then proceed to analyse the problem of *what is* coming from *what is* or *what is not*. Aristotle's handling of this problem in the *Physics* I.8 is mainly focused on defining the two terms, *what is* and *what is not*. For the early philosophers' misunderstanding the problem of becoming is, Aristotle thinks, because they fail to distinguish the meanings of each term. That is, *what is* has two contexts, 'coming from what is' and 'what is, acts and is acted upon' (191b3-6), and *what is not* means 'in so far as it is-not' (b8-10).

Since these three theses are, I think, Aristotle's basic grounds for his claim that 'there is change in nature' I will concentrate on expounding his position and finding some problems which might occur against it.

I.1 Aristotle's Grounds for Assumptions

Let us begin with asking where Aristotle's inquiries start from. Throughout the history of Western Philosophy, numerous questions, concerning the nature of the universe, of man, and the like, have been raised and many philosophers have never ceased to make their effort to give proper answers to them. As Aristotle states in the *Metaphysics*, it is true that we cannot expect that all questions can be answered.

> ... evidently they were pursuing science in order to know... the possession of it might be justly regarded as beyond human power: for in many ways human nature is in bondage, so that according to Simonides 'God alone can have this privilege'... (*Met.* 982b 21-32)

Nonetheless, it is undeniable that in searching for an answer to questions most of the questions are based on a certain number of assumptions which are temporarily not to be questioned. In effect, an assumption is the beginning of questions, for since we are not able to ask and solve every matter which we confront at every moment it is required for us to have a starting point of our enquiries.

What is then Aristotle's starting point? A detailed explanation concerning his emphasis on our experience can be found in the *Physics* I.1. He says,

> ... in exploring nature... There is a natural path for us to follow. It leads from what is familiar or evident to us to what is by nature clear or conclusive. The reason for this is that what is intelligible relatively to ourselves and what is inherently intelligible are not the same. Hence it is also necessary for us to conduct our investigation in this manner. We must start with what is

naturally obscure, though apparent to us; and we must advance to what is naturally manifest and determinate. (184a 16-22)

At first sight, it seems obvious that the distinction between what is obscure and what is apparent to us is according to our observation. However, it should be noted that Aristotle's suggestion is not only restricted to our observation, or our sense perception. Of course, when we observe natural phenomena happening around us it is apparent to us that there is change in nature. For example, Socrates' nose which was pale becomes red, day comes after night, and so on; we can take numerous examples to prove the fact that there is change. However, with sense perception we are able to know that, for example, there is fire in front of us or there is something hot. But, it is not possible for us to grasp with sense perception alone the connection between fire and being hot, i.e. fire is that whose essence is to be hot. This connection is what Aristotle means by 'what is obscure to us'.

As it will be shown throughout this work, what Aristotle wishes to suggest is that if we do experience such and such a thing we should take it for granted. In brief, Aristotle would say that, as he does in explaining nature in the *Physics* II.1, it would be unnecessary to try to prove what is apparent to us (193a 4-5). Given the fact that there is change in nature, the next step for us to take is, as Aristotle suggests, to enquire into the rest of questions such as how an assumption based on our senses can go further into a question that we cannot reach immediately with the senses.

I.2 Aristotle's Objection to the Presocratic Assumptions

"There must be first principles." This is a basic assumption which natural philosophers have successively maintained since the beginning of philosophy. Thales, who first pays close attention to natural phenomena, notices the fact of ceaseless change which is the most characteristic mark of nature; spring and

summer, birth and death, a child becoming an adult, and the like. They are obvious examples of coming-into-being and passing-away which we can observe through our senses. It is therefore natural that Thales asks the question what the beginning of them is or what the primary or ultimate nature of the world is. Since Thales, philosophers have considered the original or primary stuff or things as one or many. How many principles are there? In order to answer the question, Aristotle presents a long refutation of the Presocratics on the ground that their attempts are not at all successful for they are based on a wrong assumption.

Some of them think that being is a single principle, while others think there is a plurality of principles. And some of them even think that there is no change at all. Aristotle refuses all these assertions. Aristotle's condemnation of his predecessors is based on his assumption that being is not a unity (*Phy*. I.2) and that there is change. "We, on the other hand," says Aristotle, "must regard it as basic that all or at least some natural beings are changeful, as is evident from induction (185a12-14)." His grounds for the assumption that there is change are, counter to Parmenides who denies the senses as illusory, derived from his observation of the natural phenomena which we can immediately observe through our sense-perception. As we have seen in the previous section, his suggestion is that we should regard our experience as a starting point.

Aristotle in the *Physics* I.2 divides the Presocratics into two groups in accordance with their assertions on the number of first principles. Although it is true, as Bostock says, that "he often seems much more interested in the question of how many principles there are than in the question of what they are,"[4] the number of the principles is in effect not so significant to him. More important points for him are the fact that there is change in nature and the need to explain such change. However, since this is the stage where we examine how Aristotle is able to establish his own assumptions against the Presocratics we will briefly see his objection to

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4 D. Bostock, `Aristotle on the Principles of Change', in M. Schofield and M.C. Nussbaum (eds.), *Language and Logos*, (Cambridge: Cambridge University Press, 1982), p. 181.

them concerning the number of the first principles. Aristotle maintains that the first principle is neither one nor a plurality.

> If there is a single principle, it is either independent of movement as Parmenides and Melissus allege, or subject to movement as natural philosophers say; some of the latter identify the first principle with air, whereas others identify it with water. If there is a plurality of principles, they are either limited or unlimited in number: if they are numerically limited but more than one, there are two, three, four, or some other definite number of them; if they are numerically infinite, they are either, as Democritus describes them, homogeneous, though different in shape or in kind, or even contraries. (*Phy.* 184b14-22)

Among those who maintain there is only one single principle, Thales sought for the original stuff of numerous things and considered water as the fundamental and primary thing. A general account of the reason why he thought of water as the beginning is said to be due to his observation of the process of water being solid, when it is frozen, and of being vaporous, when it is heated. Anaximenes, on the other hand, presents air as the principle of man's life since he witnessed the fact that man is able to live as long as he breathes. From this point of view, he concluded that "the primary substance bears the same relation to the life of the world as to that of man."[5] He introduces the notion of condensation and rarefaction in order to explain the difficulty of how it is possible that all things come from one primitive element. For Parmenides, Being or reality is 'the One' which is complete, and so it neither requires any change or movement nor has contraries in it. And therefore he dismisses the multitude of sensible things as mere illusion. For him *what is* is always present and will ceaselessly be in the future.

Aristotle rejects as absurd the Presocratics' assertions that there is no change and that being is a unity. "To consider whether being is a unity and is independent of

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5 John Burnet, *Early Greek Philosophy* (London: Adam and Charles Black, 1908), p. 79.

movement," says Aristotle, "is to turn one's eyes away from nature (*Phy*. 184b29-30)." He explains that being is not a unity for, if there is nothing but unity, then there is no longer any principle, since a principle is a principle of some fact or facts (185a3-5), and that there cannot be any difference between a principle and a fact or facts. What he maintains throughout the *Physics* is that there must be some distinction between one thing and another, otherwise, there cannot be different things in nature as opposed to our observation. Similarly, if there is only one principle then there is no distinction between the principle and a fact, and therefore the principle is the fact itself and *vice versa*. If they are the same, then we need not enquire into what a principle is. If a fact is a beginning of itself it cannot be called a principle for a principle designates a beginning of 'many beings'. The passage requires us to examine Aristotle's conception of the first principle that is defined as the beginning or origin of many beings.

... principles are not to be derived from one another or from anything else, but they are themselves the beginnings of everything... (*Phy*. 188a 27-28)

We might well assume that, for Aristotle, it is meaningless to name as the first principle a principle which is not differentiated from a fact or facts. In other words, if there were a single principle it is vacuous to claim that a principle is an origin of itself. Nevertheless, some presocratic philosophers made an error claiming that there is only one principle and at the same time trying to seek the origin. Therefore, he concludes that the number of the first principles is not one.

In objecting to his predecessors' assertions, Aristotle probably has in mind his notion of categories of which ten are listed in his work, the *Categories*. In the fifth chapter of the short work, he differentiates the primary substance, e.g. the individual man, from the secondary substance, e.g. the species 'man'. The former is neither predicated of a subject nor present in a subject, whereas the latter is predicable of a subject but not present in a subject. On the other hand, the other

categories, such as quality, quantity, relation, and so on, are predicated of a subject and present in a subject. In addition, they admit variation of degree, whereas there is no varying degrees in substance.

Armed with the theory of the categories, he goes on to argue that the meaning of 'to be' is not single but various. He asks in what sense all things are declared to be one. If all things are one primary being which has quantities and qualities, whether or not they are separated from one another, beings are not one but many (*Phy.* 185a 27-29). For if things have different quantities or qualities, then they are different from one another in shape, in place, in kind, or in size. Besides, there cannot be anything which has quantities or qualities apart from a primary being. Presumably, Aristotle wants to point out again that quantity and quality which are predicated of something else is different from a subject which does not belong to something else. Therefore, he objects to Parmenides's and Melissus's reasoning that 'to be' has only one meaning (*Phy.* 185a8-12).

Aristotle goes on to expound in what sense the Presocratics assert that things are 'one'.

> To be "one" means to be (1) continuous or (2) indivisible or (3) one and the same in a definition stating "what-it-meant-to-be-something" (for example, vine-culture and wine-growing). But (1) if things are "one" in the sense of being continuous, their "one" is "many" inasmuch as anything continuous is infinitely divisible. ... Do part and whole constitute a unity or a [duality or] plurality, and in what sense? ... Then (2) if things are "one" in the sense of being indivisible, there will be no quantity or quality ... And (3) if all things are one in definition (like "clothes" and "garment") ... then the same thing may be both good and not good or, for that matter, both a man and a horse. (185b8-27)

Aristotle's understanding of things being declared to be 'one' is as follows; he, first of all, points out that, in so far as one is infinitely divisible into as many parts as the number of things, 'one' is said to be many things. He considers spatial divisibility as

well as temporal divisibility (*Met.* 1016a7). However, he in the *Physics* only raises a question about the parts which cannot be involved in a whole. Aristotle notices the relation between parts which are divided from a whole and the whole which does not contain the parts, and asks if the parts and the whole are a unity or a plurality. It reminds us of Plato's 'Third man' argument which requires an infinite regress. That is, if there is a form 'B' of a man 'A', for example, then there should be another form 'C' of 'A' and 'B', 'D' of 'A', 'B', and 'C', and so on. All the same, in order to say that parts and a whole are one, there must be another whole and the whole and parts of it again require another whole, and so on, *ad infinitum*. It calls for this infinite regress because it successively requires larger and larger concepts of 'whole'. Therefore, if this is the case, he asks, how parts and whole are said to be 'one' (*Phy.* 185b17).

Secondly, he conceives that things are said to be one in so far as they are indivisibly one. If things are one in that sense, he says, there will be no quantity or quality (185b16-17). It is quite difficult to understand what exactly Aristotle means. He probably intends to claim that nothing can exist without having properties and that, if there are things which have such properties, they must have differences in themselves. However, if my interpretation is right, it does not seem plausible for Aristotle to say that there is no quantity or quality. For there is the possibility that things might have only one kind of quantity or quality. If things are one in the sense of being undivided, then it is true that they do not have any differences. However, to say that things cannot have different quantities or qualities without being divisible, does not imply that they do not have any quantity or quality at all. It might well be assumed that there can be one being which is composed of diverse beings which have different qualities or quantities. But it can be simply denied since it is absurd to say that, although things are indivisibly one, they can have differences in quantity or quality. For something which is differentiated from others is that which is already divided. Otherwise, it cannot be said to be differentiated from others.

Thirdly, Aristotle's objection to things declared to be 'one' is that Heraclitus and his successors make being good and being bad or being good and not being good the same. If all existing things are one in definition they are the same in the sense of being. Aristotle says that if they are one they do not have any difference and therefore they are not one but 'not anything' (185b25-26). Again, according to their theory, both a man and a horse are one and the same in definition. Then, they are not anything since there is nothing by which we can distinguish the one from the other. All the traits of a man and a horse are in one and they are in the state of being a mixture. What Aristotle claims is, I think, that the components are not merely mixed but that they are in confusion; that is, there is not in beings any trait by which we can differentiate them from each other. Therefore, he concludes that being is 'not anything' rather than 'one'.

After rejecting all the meanings of the presocratic 'one', Aristotle adds further explanation by taking examples from ordinary expressions such as, 'the man is white', 'the man is musical', and the like. In these expressions, the subject 'man' seems to be many different beings. 'To be what white is' is clearly different from 'to be what is white'. That is, 'to be what is white' is not to be whiteness but something which has whiteness. Aristotle presents the fundamental difference between them as that the former is an accident which belongs to a subject whereas the latter is a subject or 'what primarily is' which is not predicated of something else (See *Phy*. 186a28-b4).

His definition of the term 'accident' is something which may or may not belong to a subject (186b19-20) and is something which cannot exist without a subject; for example, an accident 'sitting' may or may not belong to a subject 'man' and cannot exist without reference to the subject. What I mean by 'cannot exist' is that, whenever we describe an accident, its real meaning cannot be defined without being applied to a subject; an accident 'redness' is hardly possible to be defined without a subject being red.

In conclusion, Aristotle's belief that beings are many is derived from the thought that, for instance, an accident 'musical' or 'educated' is defined by means of the definition of a man (186b20-21). And an accident, e.g. being educated, does not contain the definition of the whole, e.g. a man; that is, being educated is not identified with a man. However, it is an inherent part of the definition of a man (b24). Thus, a man seems to be many by adding different accidents, for each accident is a factor which makes 'what is not' 'what is'. That is, for a man who is uneducated to be educated is a coming to be *what is* from *what is not*. Thus, this way of explanation faces the question of how it is possible for what is to come from what is or from what is not.

I.3 *What is* comes from *What is* or from *What is not*

The problem of '*what is* coming to be from *what is* or from *what is not*' which Aristotle tries to expound in the *Physics* II.8 is worth examining since this is indeed the question of whether change is possible at all. Some commentators have claimed that Aristotle does not acknowledge the Parmenidean claim that nothing comes from *what is* or from *what is not*. However, this is, I think, misleading in virtue of the following, admittedly difficult passage:

> In their inexperience, those who first sought philosophic truth and the natural development of beings were diverted into a wrong course of reasoning. "Nothing comes into being or passes out of being," they said, "because whatever comes into being would have to come from what is or from what is-not; and both of these alternatives are impossible." They went on to explain: "What is does not become anything, since it already is; and nothing comes from what is-not, since something must underlie." Thereupon they even went beyond this opinion as they progressively amplified its consequences until they came to the conclusion: "There cannot be many beings; only being itself is." (191a 24-34)

In this passage, Aristotle divides the Parmenidean claim into a premise and a conclusion. Parmenides' course of reasoning is that, since nothing comes from *what is* or from *what is not*, change is impossible and so there cannot be many beings. It is indeed obscure whether Aristotle refutes both the premise and the conclusion of Parmenides. However, it seems that, although Aristotle refutes Parmenides' thesis that there is no change at all he might have accepted the Parmenidean basic assumption, which draws the thesis, that nothing comes from what is or from what is not. That is, what Aristotle denies is the conclusion drawn by a wrong reasoning, not the premise. Again, Aristotle seems to conceive that what Parmenides claims as to generation, that nothing comes from *what is* or from *what is not*, is right. If he denied the Parmenidean claim he would not be able to reach the notion of privation. That is, as seemed apparent to us, there is becoming or change which seems to begin from *what is* or *what is not*. Aristotle does not stop at the place where he merely accepts the theory that nothing can come from *what is* or from *what is not* 'absolutely', but goes further to enquire, resting on our ordinary experience, into the question of how, then, there can be 'becoming' which we see around us. At this stage, he again emphasises on the importance of believing in our ordinary experience. It should be again noted here that the fundamental difference between Aristotle and Parmenides is that the former has no doubt of our senses whereas the latter dismisses them as illusory. Aristotle probably wishes to suggest "open your eyes and look around! if there is no change, what are the events happening around us and, if they are not changes, how can you explain them?"

If *what is* were not from *what is* or from *what is not*, then there would not be any becoming in nature. For *what is* and *what is not* are all we can think of as the origin of becoming. However, it seems true to say that nothing comes from either of them 'as such', and therefore there must be something else in them, namely, something inherent in themselves.

We for our own part agree with them that nothing comes from what "is-not" absolutely, but insist that a thing does come from what "is-not" in an incidental sense: it comes from its "privation," and this is, by itself, what "is-not"... (*Phy.* 191b 14-18)

As a result of the process of reasoning stated above, he concludes that the Parmenidean claim is due to failing to understand the proper meaning of the two terms, *what is* and *what is not*. So far, the argument of Aristotle's theory of becoming might be summed up by the following passage;

What does it mean "for anything to come from what is or from what is-not"? Or what does it mean "for what is-not or for what is to act upon anything or to be acted upon by anything or to become anything"? Nothing essentially different from what it means "for a physician to act upon anything or to be acted upon by anything or to become anything"!... so that we must distinguish two meanings also in such expressions as "coming from what is" and "what is, acts and is acted upon."... Clearly, then, [to deny] that anything "comes from what is-not" means, properly, [to deny] that anything "comes from what is-not in so far as it is-not." (191a36-b10)

As so far shown, there are two difficulties here about which Aristotle attempts to give an explanation; how it is possible for *what is* to come from *what is* and from *what is not*. He first explains *what is* coming to be from *what is not* in terms of privation. As a physician he cures or fails to cure an illness but does not build a house. He may build a house as a house builder, but not as a physician. His building a house is some capability which he does not yet have, namely, *what is not*. Therefore, it may well be said that his ability to build a house comes from *what is not*. If he already had the capability of building a house he would not have to acquire the capability. But, since he is not a house builder, who has the capability of building a house, but a physician (what is), he is able to attain the capability of building a house (what is not) [in so far as he is not a house builder]. Thus, a physician's having the capability to build a house is that which he does not have

before; that is, *what is* is from *what is not*. Not all physicians can always be house builders but some physician may 'incidentally' be a house builder. That is, some physician is capable of attaining the capability of building a house in so far as his potentiality of being acted on appropriately corresponds to the potentiality of acting. This follows Aristotle's saying that *what is* comes to be from *what is not* "in so far as it is not" (191b10), a closer examination on this point will be discussed in chapter III.

There are two points to which we should pay special attention. First, *what is not* in Aristotle's sense seems to be not nothing but something. It presupposes a subject which can have a privation. Therefore, it cannot be nothing in a strict sense. Secondly, *what is not* becoming *what is* in his sense is change of a subject with reference to an attribute, not change of a subject itself. To avoid any misleading suggestion which might occur with regard to the problem of what is it that changes, let us briefly read Martin's remarks on 'substance and accident'.

> People often talk as if the accidents were that which can change, and the substance that which does not change: this is very alien to the manner of speaking of Aristotle and Aquinas. For them, it is precisely the substance that changes, that is the subject of change: the accidents do not change at all, strictly speaking. They merely (in some sense) cease to exist and come into existence.[6]

What Martin wishes to say is that there cannot be any accident without presupposing a substance and that, similarly, there is no substance which does not have any accident. It should be noted that change always presupposes something which changes (*Phy.* 190a16-17) and is from something to something else (189b33-34). That is, change is of a substance that has accidents.

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[6] Martin, op.cit., pp. 62-63.

Let us return to our main discussion of *what is* coming into existence from *what is not*. Since we have reached the point that *what is not* presupposes a subject which has a privation we are required to distinguish whether he means privation is the privation of *what is not* or *what is not itself*. If it is the former then *what is not* is not absolutely *what is not*, but in a sense what is, since *what is not* absolutely cannot be anything, namely, it is nothing. And if it is the latter case then *what is not* must presuppose some subject, which can have the privation, in order that there should be 'becoming'. In brief, Aristotle's attempt is not to solve the problem of nothing becoming something, but to solve the problem of a subject which has a privation coming to acquire the attribute that it lacked.

Aristotle moves on to sort out the next difficulty of how it is possible for *what is* to come from *what is*. Although he does not state it clearly, he probably adopts here again the notion of privation. That is to say, what is comes from the privation of what is; *what is* comes from *what is* 'in so far as *what is* is not'. But, in effect, the latter phrase should be understood as '*what is* is not merely *what is*'. This interpretation applies to the problem of what is coming from *what is not*, too. Otherwise, *what is* becomes *what is not*, *what is not what is*. In answering the difficulty, he takes an example of a substance's coming into existence. The relevant passage, which is obscure, concerning the second difficulty of becoming reads thus;

The point at issue is as if we argued about an animal coming from an animal, a particular animal from a particular animal, a dog from a horse: the dog would come not only from a particular animal but from "an animal," but would not therefore come into being as an animal since this [character] is already there; if a particular animal is to come into being not incidentally but absolutely, what it will come from is not an "animal". Similarly, if any being is to come into being [in an absolute sense], it will not come from what is any more that it will come from what is-not (namely, as we have said, in so far as the latter is-not). Moreover, we are not denying that "anything either is or is-not" [which is implicitly denied in the opinion we have been examining]. (191b19-25)

What is, then, Aristotle's sense of *what is*? For a dog to beget a puppy there should be the form of the dog and some matter to become the puppy. But it is undeniable that the puppy will be different from the dog in shape, in size, etc. The matter which is the cause of begetting the puppy is also different from that of which the puppy is made. What is it that is to beget a puppy? There are a dog, form, and matter. On the other hand, a form of a puppy, matter of which it is composed, and its becoming *what is* are that which did not exist until it is born. Without considering these complex problems Aristotle, in the *Physics*, seems naively to explain that a puppy which did not exist in the past comes into existence from a dog which has existed.

As we have so far seen, although Aristotle does believe that he solves the problem of becoming by adopting the notion of privation, the problem is not yet sufficiently answered. For privation seems merely an empty space and therefore it requires some power to fill it in. Is this power the potentiality which Aristotle defines as an originative source of change? We may leave it unsolved until we have examined his distinction between potentiality and actuality.

Chapter II

Aristotle's Conception of Change

As we have discussed, Aristotle is now entitled to some extent to claim the possibility of change in nature. Where does change start from? Aristotle understands change as coming about between a pair of contraries, for example, between musical and unmusical. And he conceives that the Presocratic contraries are also first principles which are beginnings of many beings. Therefore, at this stage we are to enquire into the questions how far his belief is plausible and what are the characteristics of contraries. And in order fully to understand the role of privation which appears with reference to contraries and as an introductory part of proceeding to investigate the notion of potentiality which is said to be an originative source of movement (*Met.* 1046a23), we are now required to enquire further into Aristotle's conception of change.

II.1 The Genesis of Changeable Subjects

From earlier analysis of Aristotle's criticisms of the Presocratic principles we reached a conclusion that he, like the Presocratics, admits the notion of the first principle as the beginning of many beings. Whether there is a single principle or a plurality of principles, from the definition of the first principle there must be "becoming" as long as there is something called the first principle and as long as it itself is or they themselves are not many beings. Aristotle's definition of principles is (1) that they are not to be derived from one another or from anything else, but (2) that they are themselves the beginnings of everything (*Phy.* 188a27-29). And also

he assumes that "all beings that are naturally produced are contraries or are composed of contraries" (188b27-28). Thus, it is clear that what Aristotle adopts as first principles is contraries.

Some take the contraries which are more intelligible in the order of reason, namely, the universal (since reason grasp the universal) ... ; whereas others take the contraries more accessible in the order of sense perception, namely, the particular (since sense perception grasp the particular) ... At any rate, *it is evident that our principles must be contraries.*[7] (*Phy.* 189a6-11)

The concept of contraries is, as the passage above shows, already pervasive among the Presocratics and the Platonists; Anaximenes introduces the notion of rarefaction and condensation, the Pythagoreans of odd and even, Parmenides of earth and fire, Democritus of aggregation and separation, Empedocles of love and strife, and so forth. Thus, all of these thinkers directly or indirectly take note of the importance of the concept of contraries. However, Aristotle does not accept any of his predecessors' principles as proper principles.

It seems clear that Aristotle's contraries are, as we might infer from the passage cited above, different from those of others. His principles are the most universal in the sense that for him contraries themselves are principles whereas others take less universal, namely, particular contraries, such as the great and the small, the dense and the rare, or the like. In other words, the contraries of the Presocratics show that they are examples of contraries rather than contraries themselves. Accordingly, as he himself notices, Aristotle's notion of contraries as first principles is the largest concept.

... there cannot be more than one pair of contraries, since primary being is but one [and the same] genus of beings: its principles will therefore differ from one another in priority and subsequence

[7] The italicized sentence is my emphasis.

only; these will not differ in genus since there is in any single genus *a single pair of contraries to which all the pairs of contraries may be reduced.*[8] (189b24-29)

Aristotle supposes that the Presocratics also believe the contraries as principles but this hardly seems plausible. For their contraries seem to be adopted to assist beings which come into existence; that is to say, they are forces or causes to help the first principle that brings about many beings. He takes Parmenides' and Democritus' contraries as examples of principles: it is not apparent whether he thinks that only their contraries are principles or those of the other Presocratics are principles as well. However, it is thought that he seems to treat all the Presocratics' principles as the first principle. Since Aristotle in the *Physics* I.5 explicitly criticizes the two Presocratics, Parmenides and Democritus, we are now to examine whether their contraries may well be called first principles, in accordance with Aristotle's terminology, which is the genesis of many beings.

To argue this thesis what we need to know is where these contraries are coming from and whether they are the beginning of all the beings. However, it is indeed difficult to find any relevant passage to the genesis of the contraries in the fragments of the Presocratics or in Aristotle's own writings. We might assume that the notion of contraries is derived as an attempt to explain how it is possible for many beings to come from the first principle. For the Presocratics' common belief was that the first principle itself does not have any power to bring about other beings spontaneously. Therefore, the Presocratics required such a notion.

In analysing Parmenides' contraries, we should first point out that Parmenides's adopting the notion of contraries is contradictory. For the notion that Parmenides has in mind is hardly possible for anybody who does not admit the possibility that there is change since the definition of the first principle implies change, becoming,

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[8] The italicized paragraph is my emphasis.

or movement. Nevertheless, Parmenides indeed shows inconsistency in adopting the notion in an argument about cosmology. He is said to claim thus:

The air is separated off from the earth, vaporized owing to the earth's stronger compression; the sun is an exhalation of fire, and so is the circle of the Milky Way. The moon is compounded of both air and fire. Aither is outermost, surrounding all; next comes the fiery thing that we call the sky; and last comes the region of the earth.[9]

As stated in an earlier stage, for contraries to be able to be first principles in Aristotle's terminology they must satisfy the two conditions; (1) everything must come from contraries and (2) they are not derived from anything. Contraries are of course composed of two opposite terms. Therefore, in order for it to be said that they are beginnings of everything, beings, Aristotle maintains, should come from their mixture or from both of them, not from only one of them.

... everything that comes into being or passes away comes from or passes into one of a pair of contrary states or a state intermediate between them; and since the intermediate states are composed of contraries (colors, for example, of light and dark shades) ... (*Phy*. 188b23-28)

But the fragment about the Parmenidean contraries, i.e. fire and earth, quoted above seems to suggest that different beings are originated from just one of them; the air is from the earth whereas the sun is from fire. Therefore, Parmenides' contraries seem not to be first principles as Aristotle analyses. As often pointed out by commentators, it is hard to deny Aristotle's remarks on the Presocratics since we are indebted to him for preserving a great deal of their thought. Nonetheless, we cannot help thinking that it is quite curious that Aristotle does not notice the fundamental difference between his and their notion of contraries. In brief, the

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9 DK 28A 37, in G.S. Kirk, J.E. Raven, and M. Schofield (eds.), *The Presocratic Philosophers* (Cambridge: Cambridge University Press, 1991), pp. 258-259.

difference is that for Aristotle beings come into existence from both contraries or from their mixture, whereas for Parmenides they can be originated from just one of contraries.

The fact that not all the Presocratic contraries can be defined as first principles is more clearly revealed when we examine Democritus. For Democritus, innumerable atoms are the primary bodies and their change is a result of collisions.

> For they [sc. Leucippus and Democritus] say that their primary magnitudes are infinite in number and indivisible in magnitude; rather all things are generated by the intertwining and scattering around of these primary magnitudes.[10]

This passage clearly shows that the contraries, "intertwining" and "scattering", are efficient causes rather than first principles which is the beginnings of beings in Aristotle's sense. Aristotle seems to confuse the problem of "how" [or of "by"] with that of "where" [or of "from"]. Again, the contraries of Democritus are not themselves the origin of beings, but efficient causes which are "the principle of individuation causing the emergence of differences and giving rise to a plurality of substances and determinations".[11] Thus, it is clear that Democritus's contraries are not principles in Aristotle's own definition since atoms precede them.

As we have seen, even though the conclusion is drawn by Aristotle's misunderstanding his predecessor's contraries, he reaches the most universal notion of contraries to which other contraries are reduced and which are the genesis of many beings that change. However, it is still obscure what they are and what characteristics they have. At this stage, one might raise the question whether contraries possess matter since they are defined as the genesis of beings.

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10 Ibid., p. 424.

11 J.P. Anton, *Aristotle's Theory of Contrariety* (London: Routledge and Kegan Paul, 1957), p. 37.

.. all things which are generated from their contraries involve an underlying subject; a subject, then, must be present in the case of contraries, if anywhere. All contraries, then, are always predicable of a subject, and none can exist apart, but just as appearances suggest that there is nothing contrary to substance, argument confirms this. No contrary, then, is the first principle of all things in the full sense; the first principle is something different. (*Met.* 1087a36-b4)

For Aristotle, "a pair of contraries alone is not sufficient, although necessary, for understanding any substance or process, because no given contrariety in itself can constitute a substance or a process".[12] Aristotle therefore presupposes a primary being which is not constituted by both contraries at the same time. However, he nowhere gives a clear account of the question why contraries cannot constitute a substance. Nonetheless, it is presumed that it is because they are abstractions which do not contain any matter.

On the other hand, once it is admitted that they are predicable of a subject it is clear why they are not to be present in a subject at the same time. If he considers of contraries as forces which are present at the same time in a subject they are not first principles because, for Aristotle, first principles are defined as the beginnings of everything, not as efficient causes. And if they are present at the same time in the same subject the number of the first principlescannot be more than one, as some of the Presocratics claim. For in that case the origin of beings is the subject, whatever it may be, and the role of contraries is only restricted to control the grades of beings in producing the beings. In other words, the existence of contraries presupposes a subject and the source of beings might be the subject rather than the contraries. Let us consult the *Metaphysics* to find the concise exposition of the uses of contraries.

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12 Ibid., p. 33.

The term "contrary" is applied (1) to those attributes differing in genus which cannot belong at the same time to the same subject. (2) to the most different of the things in the same genus. (3) to the most different of the attributes in the same recipient subject. (4) to the most different of the things that fall under the same faculty. (5) to the things whose difference is greatest either absolutely or in genus or in species. (*Met.* 1018a25-32)

It may well be inferred from the passage cited above that Aristotle conceives that one of the contraries should be present in a subject; for example, hot should be present in fire and cold in snow but hot and cold cannot be present in fire at the same time. Thus, it is concluded from our discussion so far that for Aristotle contraries are contrary attributes involving an underlying subject, which cannot be present in the subject at the same time. Thus, the question concerning the relation between a primary being, or a subject, and contraries leads us to the question of the relation between a subject and privation, and possession.

The primary contrariety is that between positive state and privation - not every privation, however (for 'privation' has several meanings), but that which is complete. And the other contraries must be called so with reference to these, some because they possess these, others because they produce or tend to produce them, others because they are acquisitions or losses of these or of other contraries. (*Met.* 1055a33-38)

It is however quite obscure how contraries which are 'the beginnings of many beings' are said to be contraries between privation and possession. Thus, it might well be presumed that for Aristotle contraries are principles of change rather than principles of existence. For if they were the latter they would not necessarily require any subject since they do not have to keep their identity throughout change; that is, beings come into existence from themselves and cease to exist, and then there remains nothing that we can identify throughout their change. But if they were the principles in the former sense they would have to involve a subject which

persists throughout change. For change is the process from something to something else and always presupposes something that persists throughout the change. Thus, in order to fully grasp the characteristics of contraries we are now required to examine Aristotle's conception of change.

II.2 The Four Types of Change

As we have just seen, the concept of contraries is one of Aristotle's major assumptions which underlie his thought in analysing change. Aristotle's basic thought is that change is a process from something to something else or something different (*Phy*. 189b33-34). For example, when we say a non-educated man becomes an educated man, it is clear that the former is different from the latter and therefore we may well say that there is change. The man becoming educated can be easily ascertained through some test and we at once know that there is change in the man. As the example shows, for change to be possible there must be a pair of contraries since change is a process from something to something else, and so there must be a difference between them, and there is something that persists throughout the change. In other words, change is a process from something old to something new, i.e. from uneducated to educated. Thus, in a sense change involves a replacement of contraries; that is, as Waterlow states,[13] "the uneducated that becomes educated cannot still be uneducated; nor can it already have been educated: this is ruled out by the mutual exclusion of contraries".[14] However, it is not the case that without any subject which persists uneducated is replaced with educated. That is, the change is from uneducated to educated in a subject, a man

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[13] S. Waterlow, *Nature, Change, and Agency in Aristotle's Physics* (Oxford: Clarendon Press, 1982). p. 13.

[14] I replace Waterlow's word 'cultured' with 'educated' and 'uncultured' with 'uneducated' to show the consistency in this writing.

who persists throughout the change. In addition, there cannot be any change without involving difference.

For one to be differentiated from another there must be difference between them. Aristotle maintains that there are as many kinds of movement and change as there are of being (*Phy*. 201a9-10). For attributes are involved in a subject; attributes cannot be apart from a subject and the reverse. Let us sum up our discussion so far in Aristotle's own words.

> ... when we say that "a noneducated man becomes an educated man." Also, we say either that "the noneducated becomes educated." or that "it is from the noneducated that the educated comes to be"; but we do not say that "it is from a man that the educated comes to be." but rather that "a man becomes educated." Of the subjects simply designated as such in these assertions of "becoming," the latter endures, whereas the former does not. For a "man" endures as such, that is, he is a "man" even when he has become "educated"; but the "noneducated" or "uneducated" does not endure as such, and neither does the "noneducated man" or the "uneducated man." ... we find that change always presupposes something which changes ... (190a2-32)

We have so far examined the example of a non-educated man's becoming an educated man. An educated man is composed of a subject and a form; a man is a subject or matter[15] which persists throughout change and a state of being educated is a form which comes from a state of being non-educated, a privation that the man has.

As shown above, Aristotle takes two terminal points in a change, its beginning and end. Change might well be therefore defined as a process in a subject from a privation to a form, an actuality. Thus, we now have three factors, matter, form, and privation, that are involved in change. The concept of privation implies that the

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15 T. Irwin, *Aristotle's First Principles* (Oxford: Clarendon Press, 1988),p. 210.

form was not at the beginning of the change.[16] As we shall see in the next chapter, it is to be noted that privation is a mere empty space where a form can be filled in and so it is not potentiality. Therefore, Aristotle says that what tends towards a form is matter (*Phy*. 192a24) rather than privation as such. He seems to attach the notion of potentiality to matter. Without potentiality nothing can have any tendency to change.

Let us now examine Aristotle's classification of four types of change. Although Aristotle says that the kinds of change are as many as the number of beings he thinks that they are reduced to four types; change in quantity, in quality, in place, and in substance. The first three changes are of attributes which have varying degree in them. So the process to complete the difference of degree is explained as change.

As we shall see later on, change is of attributes involving a subject, not of substance itself for there is no varying degree in substance and because substance is not involved in contraries. In defining quantitative change, Aristotle also maintains that quantities have no contraries (*Cat*. 5b11) and do not admit of variation of degree (6a19). Quantitative change is growth or diminution or, more likely, completeness and incompleteness. When something is increasing or decreasing we understand it by adopting contrary notions such as great or small, much or little, or the like. But there are no things which are absolutely great or small. For example, when we say that a mountain is small, or that an insect is great, they are so called with reference to other external things. Aristotle, therefore, believes that small is not strictly the contrary of great. For if they are contraries then one and the same thing would be both great and small; for example, if they are contrary terms, when we say a man is great compared with an insect but small compared with a whale, the man comes to be both great and small at the same time. But this is impossible. Therefore, they are not contraries of one and the same subject, but relatives. Since

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16 A. Edel, *Aristotle and His Philosophy* (London: Croom Helm, 1982), p. 56.

quantities cannot be considered apart from a subject it might well be said that they have no contraries. Aristotle continues to argue that quantities have no varying degree.

One thing cannot be two cubits long in a greater degree than another. Similarly with regard to number: what is "three" is not more truly three than what is "five" is five; nor is one set of three more truly three than another set. Again, one period of time is not said to be more truly time than another. (*Cat.* 6a19-24)

Nonetheless, he maintains change is still possible. For all the categories of quantity fall under being equal or unequal. They are relative terms which can have contraries. And they also admit of variation of degree. One and the same subject becomes both great and small when it is said with reference to the external standard. Although Aristotle does not mention that the theory is also applied to one subject which is not compared with other external things, one and the same subject is called great or small by adopting the notion of time. A boy who is small at one time is called great when he becomes an adult at another time. Thus, small and great are relative terms rather than absolutely contrary terms. This characteristic of quantity is that which is different from that of substance. Aristotle claims that no substance is relative (*Cat.* 8a13). For one and the same subject a "man" cannot be more or less than a man himself. To sum up, although quantities, like substance, neither admit varying degree nor have contraries, since they are composed of relative terms, quantitative change is possible.

On the other hand, qualitative change is described as alteration in contraries. This category means the differentia of the essence (*Met.* 1020a33) and one quality may be the contrary of the other (*Cat.* 10b12); heat and cold, whiteness and blackness, evil and good, and so on. Thus, qualitative change occurs between two contraries. If one of two contraries is a quality, the other will also be a quality (10b19-20). Aristotle continues to say that qualities admit of variation of degree; for instance,

whiteness is predicated of one thing in a greater or less degree than of another. He also admits the fact that there are some exceptions in mathematical terms, such as triangular and quadrangular. These are relative terms. And so Aristotle performs the same course of reasoning as he does in explaining quantitative change. The contraries of change in place are up and down.

...upward motion is contrary to downward motion in length, motion to the right is contrary to motion to the left in breadth, and forward motion is contrary to backward motion [in depth]. (*Phy.* 229b7-10)

Aristotle connects natural locomotion with place, time, infinity, self-motion, and so on. And a great part of the *Physics* is focused on analysing their relation. Therefore, it might well be said that locomotion is fundamental change in Aristotle's thesis.

Finally, we are now to turn to explicate change in substance, that is, substantial change. As shown in the introduction, Aristotle distinguishes two types of change, substantial change, and non-substantial change.

Since, then, we must distinguish (a) the *substratum*, and (b) the property whose nature it is to be predicated of the *substratum*; and since change of each of these occurs: there is 'alteration' when the *substratum* is perceptible and persists. but change in its own properties in question being opposed to one another either as contraries or as intermediates... But when nothing perceptible persists in its identity as a *substratum*, and the thing changes as a whole .... such an occurrence is no longer 'alteration'. It is a coming-to-be of one substance and a passing-away of the other - especially if the change proceeds from an imperceptible something to something perceptible... (*Gen. Corr.* 319b8-21)

What makes it difficult for us to understand substantial change is that it involves the problem of identity as opposed to the other types of change. In other types of

change, it is apparent that subjects are maintained throughout the change. In quantitative change, the same balloon which is small comes to be bigger. In qualitative change, the same leaves which are green turn red. In locomotion, the same man who is here at one time is there at another time. Thus, the same subject persisting is easily observed. However, in the cases of substantial change, for example, a seed becoming a plant or when a female dog's womb meets a male dog's sperm, becoming a puppy, it is difficult to grasp what is the subject that undergoes change. We might assume that there is something that persists through substantial change. But it must not be substance. For, as analysed, substance has neither contraries nor varying degree. Thus, we may summarise that change in substance does not mean change of substance itself, but of something else. That which survives change is matter; some matter in a seed or in a womb and a sperm. Then we again reach the conclusion that what changes is an attribute in matter. However, as A. Edel indicates[17], to sort out the problem of the nature of substantial change we are in effect required to analyse what substance is since the theory of change alone is not sufficient to answer it.

In the following chapter, the role of the three factors, form, matter, and privation raised in the basic analysis of change will be closely examined with reference to Aristotle's distinction between potentiality and actuality.

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17 Ibid., p. 59.

Chapter III

The Notion of Privation and Potentiality

It is often the case that, even if we begin our research in philosophy with aiming to restrict ourselves to tangible or observable objects, we find ourselves unintentionally stepping into the realm of metaphysics. If we simply define metaphysics as a subject which deals with unobservable and abstract objects the subject matter, change, with which we are mainly concerned is also, in a sense, a metaphysical concept. This is, needless to say, because there is no such natural phenomenon called change in a universal sense; the change we observe and name is a particular change, not universal. It may be true to say that in order to explain physical events, we are irresistibly required to adopt some metaphysical notions, such as privation and potentiality. This stage is where Aristotle adopts such notions to verify the possibility of change.

III.1 Matter, Form, and Privation

As we have so far considered, it may well be claimed that a thing is composed of three factors, namely, form, matter, and privation. This raises the question whether for Aristotle privation is also a constituent of a thing. We will return to this question later, but first we will examine the characteristics of the three terms as Aristotle uses them. At any rate, it may be presumed that form and matter are the components of a thing which allow us to observe and that privation is room for change.

Apart from the ambiguity of the definition of substance, Aristotle conceives that there are two kinds of substance; the concrete thing which presupposes matter and the formula in its generality (*Met.* 1039b20-22). The examples of substance in the former sense are individual or particular subjects, such as a man, a horse, and so on, whereas those in the latter sense are universal concepts, such as man, horse, and the like. According to Aristotle, substances which are composed of matter are capable of generation or of destruction. On the other hand, there is no destruction or generation of the substance in the latter sense. For what is generated is the being of this particular house, not the being of house in an abstract sense. Thus, Aristotle maintains that what can change is substance in the former sense. Aristotle believes that for beings which are first substances to be many they must not be continuous and that the matter of which they are composed must be divisible in kind. For a thing, to be divided into many, there must be differentia in it. For this reason, he says that matter contains differentia or quality (*Met.* 1024b8-9). Also, even if many beings are composed of the same matter, they are distinguished by the differentia of form. This shows that there is no sensible being which does not consist of matter and form. Thus, the differentia of matter or form is the ground for many beings.

However, change cannot be explained only by the components of matter and form since they are what-it-is as such, without any type of motion; that is to say, they only designate a state of stasis. Moreover, they might show the state of being fully filled or complete. Therefore, for Aristotle it is required to suppose a state of being not fully filled in a subject, namely, a state of lacking. For this reason, he adopts the notion of privation and considers change as filling in the state of privation. It might be an answer to the question of how there can be change of beings; that is, the notion of privation shows the possibility of change.

Aristotle explains the notion of privation in the *Physics* II.9 by distinguishing matter from privation.

We ourselves distinguish a "material" and a "privative" aspect: the material factor incidentally is-not [what it becomes], whereas what we call the "privation" is essentially what is-not-[yet]: also, a material is in some sense almost even if not quite a primary being, whereas a "privation" is not a primary being in any way at all. (192a4-8)

With Aristotle's remarks here, we cannot grasp in what sense privation or matter is is-not. However, since the two notions are compared with each other, one might naturally attempt to understand them in the same respect. We may easily see in what sense privation is said to be what-is-not from a definition of the term in an ordinary sense; that is, it designates a state of lacking. Thus, the state of privation is to be disappeared when it is filled with something. However, it is to be recalled that, as shown in chapter I.3 by citing Martin's remarks, there cannot be any change without presupposing a subject which persists throughout change. Therefore, it might be concluded that, since matter as such does not require any change, for change to be possible matter should be in a state of privation.

In conclusion, that privation is said to be essentially what-is-not designates that matter should be in a state of privation for change to be possible.

Privation, as a principle in ontological analysis, acquires significant content in connection with a given locus in two possible ways: (a) it means relative absence of a determinate capacity in respect to degree of fulfilment, and (b) it indicates the complete absence of an aspect, or stands for a certain determinate incapability and loss.[18]

However, matter cannot be explained in this way. For if there is no matter of which beings are composed then it follows that there cannot be anything and that nothing can become anything; there is no change at all. For beings, too, presuppose matter. Aristotle does not assume that matter which did not exist in the past

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[18] Anton, op.cit., p. 79.

suddenly appears in the present; that is to say, matter is indestructible and unproducible.

> Were matter produced, matter would therefore have been before it arose! But "matter" is by definition the "first" persistent being out of which anything arises and which inheres in the product in a way that is not incidental. So, too, if matter were destroyed, it would pass into matter in the end; hence, matter would have perished before it perished. (192a31-36)

Thus, we might be able to assume that he intends to show the possibility of form without matter in thought (this point is raised in *De Anima* where Aristotle deals with the problem of soul and body but for the present purpose we are to leave it unexamined) or to emphasize that except for form there cannot be anything which does not contain matter. Once again, natural beings or sensible substances, which are composed of matter, form, and, possibly, privation, are changeable. However, the notion of privation as a component is simply excluded since, as examined so far, it is only a state that allows the possibility of change.

Although we have assumed that privation is a state of matter it might be worthwhile to question whether the privation is of form or of matter since there is another factor, form, other than matter which constitutes a thing.

> Matter in the chief and strictest sense is the substratum that admits of generation and corruption [or coming-to-be and passing-away]; but in some sense the substratum of the other kind of change is also matter. (*Gen. Corr.* 320a2-5)

Even if matter is claimed to persist through change it does not follow that it does not change. On the other hand, form seems to be quite a plausible candidate to be something that changes. However, this is the same case as privation that nothing which does not presuppose a subject which persists throughout change can change. In all the opposite changes that occur matter is said to be something which underlies

the changes (*Met.* 1042a33). And the four types of change, which were expounded in the previous section, show various types of particular forms. Evans also suggests that between the material constituents of a thing and its structure and organisation (form) the matter is the subject and the form is an attribute which it possesses.[19] It is quite plausible. For, in changeable subjects which are composed of matter and form, if matter is persistent then it follows that one form is replaced by another. Change which is defined as a process from one opposite to the other may be also defined as a process from one form to an opposite form. Then, it follows that form is an attribute of matter. When we adopt the notion of privation it becomes clear. That is, change is, for example, bricks which are potentially a house. And so when they are completely attained or actualised the forms are called actualities.

Let us turn to the question whether matter itself changes. This should be applied to change in substance because the curiosity concerning matter largely occurs from the change. For example, when a seed becomes a plant we are not able to distinguish what is the matter which persists through change. In this case, we do not see if there is any change in matter itself. Let us take one more example. If we remove all the attributes and essence given to a man what remains is a certain form of matter, so called prime matter. It seems to me that for Aristotle it is of no importance whatever may be prime matter although he refers to four kinds of prime matter; earth, water, air and fire. One might be curious what the ultimate substratum which persists throughout the change will be when air becomes fire or a dead body becomes earth. It must be true that there is change. But it is difficult to see what persists through change. An explanation to this curiosity might be found at the beginning of the *Physics* where he suggests that our investigation in the science of nature should begin from what is immediately intelligible to what is not immediately intelligible to us. In other words, he might imply that the ultimate matter will in the end reach matter-ness. That is to say, when air becomes fire air

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[19] Evans, op.cit. p. 65.

and fire are thought to be different. However, whatever kind it may be what persists in the two elements is matter-ness; they are the same in the sense that there is matter. This might be the course of reasoning which human beings can reach starting from sensory perception.

In conclusion, change is now defined as a process from a state of privation to a state of possession, form. It might be said that it is generally change of form in so far as it presupposes matter which persists throughout the change. As diverse attributes are involved in a subject, matter can have diverse kinds of forms. When a small green tomato finally becomes a big red tomato 'small' and 'green' are forms in the state of lacking the forms, 'big' and 'red'. That the matter of the tomato comes to possess those forms is said to be change. But without presupposing the state of possession privation cannot be thought, for privation is the privation of the state of possession.

III.2 The Notion of Potentiality

As we have seen, diverse explanations can be given to describe a seed which is capable of becoming a plant: it is composed of the matter and form of a seed, it is in a state of lacking the form of a plant, and its matter is potentially a plant. Aristotle identifies the matter of a seed, which persists even when it becomes a plant, with potentiality and the form of a seed and that of a plant with actuality. And he believes that actuality is the fulfilment of the state of privation which is not yet actualised and which is capable of being filled, or the fulfilment of potentiality which means the capability to be actualised. Since we have defined privation as a mere empty space which designates that there is no source of change we are here mainly concerned with the problem of how, then, change is possible, or what is the real source of change, in terms of potentiality which is said to be an originative source of change (*Met.* 1046a8-15).

And, one more subject dealt with in this section is how Aristotle can defend himself with the distinction between the notion of potentiality and actuality against the problems, such as the problem of the one and the many (*Phy.* 186a5), of what is becoming from what is or from what is not (191b26-28), or the like. For, although Aristotle in the *Physics* does not give a precise account of the distinction between potentiality and actuality for the reason that he has expounded it elsewhere (b28-29), we can often find his attempt to sort out, with the distinction, many of the problems occurred in the work. Hence, it might be worthwhile to examine Aristotle's probable solutions for these problems.

Aristotle conceives of potentiality as a source of movement or change in another thing, as a factor which moves another thing, rather than as a factor in the same thing in so far as it is not itself. But he also thinks that it is the source of a thing's being moved by another thing or by itself in so far as it is not itself. When he explains potentialities between two objects there is no difficulty in understanding; a doctor can heal a patient and a patient can be healed by a doctor. However, when he explains them in one and the same thing it is more or less hard to follow. Therefore, in order to understand the notion of potentiality, we are required to carefully examine the meaning of the clause, "in so far as (or *qua*)...", which is used in expounding potentialities in a thing.

For Aristotle, there are two types of potentialities, of acting and of being acted on, and change is a transaction between the mover and the moved in which the potentialities of both are brought to joint fulfilment.[20] This reminds us of Aristotle's claim that change should admit of contraries and that such change is a process from one opposite to the other. That is to say, Aristotle pertinently maintains that change occurs between contraries, between acting and being acted on.

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[20]. Edel, op.cit., p. 84.

Action and affection both admit of contraries and also of variation of degree. Heating is the contrary of cooling, being heated of being cooled, being glad of being vexed. Thus they admit of contraries. (*Cat.* 11b1-5)

Aristotle maintains that "everything moved is moved by a moved mover" (*Phy.* 201a27). And therefore, even though a thing seems to move spontaneously, it is in effect moved by something else in it. There are at least two factors in kind in a thing; one is that which moves and the other is that which is moved by it. Hence, what the clause "in so far as..." indicates is that, when one potentiality affects or acts, the other should be acted on. For example, when a doctor who is ill heals himself, his being healed is not as a doctor, but as a patient. Conversely, his healing himself is not as a patient, but as a doctor. Therefore, the potentialities, to act and to be acted on, are different in the sense that, according to Aristotle, one potentiality is in the agent and the other is in the patient.

Obviously, then, in a sense the potency of acting and of being acted on is one (for a thing may be 'capable' either because it can itself be acted on or because something else can be acted on by it), but in a sense the potencies are different. For the one is in the thing acted on: it is because it contains a certain originative source, and because even the matter is an originative source, that the thing acted on is acted on, and one thing by one, another by another... (*Met.* 1046a19-24)

In the passage above, Aristotle also states that the potentiality of being and of being acted on is one. The passage might be construed in three ways. Firstly, even though the potentiality of acting is in the agent and that of being acted on is in the patient, they are one in the sense that in their degree, or amount, to change or to be changed is the same as the other. That is to say, when water is heated by fire the degree of the potentiality of the water's being heated should be exactly the same as that of the potentiality of the fire's heating it. For example, for water to be heated to five degrees fire should heat it exactly at five degrees, not over or below.

Secondly, the two potentialities are one in the sense that they move towards the same actuality; for example, the potentiality of water and of fire move towards being hot. Thirdly, they are said to be one in the sense that a thing may act on something else and something else may act on it. In other words, the potentiality of acting and of being acted on are one since what is acted on can be capable of acting on something else. This interpretation gives rise to a question. For if, in a thing, acting can play the role of being acted on, and being acted on of acting, then all changes in the thing would be internal and they do not need any external factor to act and to be acted on since the internal factor in a thing can play both the roles, acting and being acted on. Therefore, for a thing to change, it does not call for any other external cause as a necessary efficient cause.

How, then, is it possible for a thing, which does not necessarily require any external force to change, to be connected with the external factor? Aristotle never explains the relationship between agent and patient. However, we may find the solution from his distinction between the potentialities in the sense of internal factors in a thing. That is to say, apart from the potentiality which is able to play both the roles, there might be two more types of potentialities which can play only one role, acting or being acted on. Therefore, although Aristotle does not give us the ground for the connection between one thing and another, between agent and patient, we may well assume that, if there is an internal agent or an internal patient factor in a thing, it may require external factors to change. But it still does not follow that the internal factors must require external factors. Therefore, we are again required to adopt the notion of privation. The potentialities which play only one role call for the other potentialities which play the opposite role to fill the state of privation. But why the state should be filled still remains unanswered.

What is peculiar to Aristotle's notion of potentiality is that it should be performed 'well'. This point is closely associated with teleology: that what changes always tends towards good. Such a characteristic is in the agent as well as in the patient. Aristotle supposes that there are two kinds of potentialities; a rational potentiality

and a non-rational potentiality. The former, which is in all productive forms of knowledge, requires a rational soul and is capable of contrary effects; for example. the art of building can produce both building and destroying. On the other hand, Aristotle assumes that potentiality which is an originative source is also present in soulless or lifeless things, such as the hot or the cold; the hot is capable only of heating and the cold of freezing. This sort brings about only one effect. This is called a one-way process, whereas the rational potentiality is a two-way process, e.g. a doctor produces both disease and health (*Met.* 1046b6). However, this is also in a sense a one-way process for it applies rather to positive fact (1046b10).

The states in virtue of which things are absolutely impassive or unchangeable. or not easily changed for the worse, are called potencies: for things are broken and crushed and in general destroyed not by having a potency but by not having one and by lacking something. and things are impassive with respect to such processes if they are scarcely and slightly affected by them. because of a "potency" and because they "can" do something and are in some positive state. (1019a 26-34)

The grounds for his claim that what leads to a bad result is not having a potency or a potentiality, but not having one, become clear with respect to his other assertion that actuality is prior to potentiality (1049b5). Firstly, it is prior in formula. For the capability of seeing presupposes something which can have the capability. For example, a man's capability of seeing is from the man who has eyes, not the man from his capability; a man should have an eye to see prior to having the capability of seeing. Secondly, it is prior in time. Matter which is potentially a puppy, or which is potentiality, in a female dog is prior in time to actuality which is not yet a puppy. However, actuality is prior to potentiality because from the potentially existing. matter, the actually existing. a puppy, is always produced by something actually existing, a dog; that is, a dog comes from a dog which already is. But there is no end of one presupposing another since an actuality is from a potentiality, the potentiality presupposes another actuality, and so forth. A(actuality) comes from

B(potentiality), B is in effect from C(another actuality), C is from D(another potentiality), and so on. So we cannot grasp what comes first. Therefore, at this stage, Aristotle presupposes "the existence of a first mover which already exists 'actually'" (1049b25-26). And so he is able to claim the priority of actuality. Thirdly, it is prior in substantiality. Aristotle explains that it is because a puppy which is posterior in becoming is prior to matter in form and in substantiality. For matter comes to have the form of a puppy which already is although the puppy itself comes into existence later than the potentiality. And the matter that come to be moves towards the form, namely, an end. Thus, Aristotle defines that actuality is an end. And actuality is identified with form in the sense that form is the end toward which change is headed and from which it has come.

As we have seen, for Aristotle there are two kinds of potentialities which are contraries, such as health and illness, hot and cold, rest and motion and the like. However, Aristotle conceives that, since contraries cannot be present in a thing at the same time, actuality also cannot be in the two ways of contraries at the same time.

> Everything of which we say that it can do something, is alike capable of contraries, e.g. that of which we say that it can be well is the same as that which can be ill, and has both potencies at once ... The capacity for contraries, then, is present at the same time; but contraries cannot be present at the same time, and the actualities also cannot be present at the same time, e.g. health and illness. Therefore, while the good must be one of them, the capacity is both alike, or neither; the actuality, then, is better. (*Met.* 1051a5-16).

Aristotle here assumes it follows that the [good] actuality is better than the [good] potentiality. He probably conceives that potentiality which comes into actuality is less than the whole potentiality, since the potentiality is composed of the contraries, good and bad, whereas an actuality means a complete reality.

Before going further to examine whether it is reasonable to believe in that actuality is the end which is always good, we should argue whether actuality implies no more change or whether it cannot play the role of potentiality for another actuality. For, if it is again a potentiality, it is also composed of the same amount of contraries, good and bad. Then, the good of the new actuality is presumably the same as that of the potentiality which becomes the actuality. For the same reason, the bad end or actuality cannot be claimed to be worse than its potentiality, as opposed to Aristotle's claim. And whatever changes has potentialities which are sources of change whether to act or to be acted on. Consequently, there seems no ground for Aristotle's claim that potentiality is that which is always moving towards good, nor is there any ground for saying that only the bad is incapable of being actualised.

Given the analysis of the notion of potentiality, let us now turn to Aristotle's attempt to expound the problem of the one and the many with the notion. At the end of the *Physics* I.2, Aristotle implies that the problem may be answered thus: a thing may be potentially [many] and actually [one] (*Phy*. 186a6). This passage seems to indicate that when a man is capable of playing music or of building a house he can be called a musician or a house-builder, and therefore he is said to be potentially many although he is actually one. There seems no flaw in this argument. However, this was, in effect, the stage where Aristotle endeavoured to settle the problem of how many beings can come from a definite number of principles. Therefore, it is plain that the passage is not the answer to the problem, for the problem is about the real beings which are present at the moment, not the potential beings, e.g. a man's capability of becoming this at one time and that at another time. As we observe, the number of a man is not more or less than one even if he is called by diverse names in accordance with his capabilities or potentialities. When we examine Aristotle's expounding the priority of the actuality to the potentiality it becomes clear that the distinction between actuality and potentiality hardly seems to be any solution for the problem. As we have seen, Aristotle believes that actuality is prior to potentiality in formula, in time, and in substantiality. In particular, in his

explication of its priority in time he clearly states that actually existing is always produced by an actually existing thing from a potentially existing one. That is, there cannot be any potential beings which do not presuppose actual beings. Then, it follows that all beings which come to existence are from the beings which have already existed. Therefore, many beings are from many beings, not from a definite number of beings. Thus, the problem of the one and the many hardly seems to be solved with the distinction between actuality and potentiality.

On the other hand, in I.8 in the *Physics*, Aristotle explicitly states that one of the solutions for the problem of what is coming from what is or from what is not might be the distinction.

> We have presented one solution of the difficulty raised by our predecessors: but there is another solution. The same terms may be analyzed with the aid of the distinction between the potential and the actual: [a product comes from what "is not" that product actually but from what "is" that product potentially]. (191b24-29).

The example that Aristotle takes for what is coming from what is not is a doctor's building a house, turning white, and healing a patient. A doctor does not build a house as a doctor, but as a house-builder, nor does he turn white in so far as he is a doctor, but in so far as he is dark. On the other hand, his healing a patient is as a doctor, not as a patient. Aristotle distinguishes the former two examples from the last and thinks the former are proper examples of the problem of what is coming from what is not. To say that what is comes from what is not seems to mean that what is comes from what is not in so far as what is not is not mere what is not, that is, what is not is potentiality which is capable of being actualised. For example, a doctor's healing a patient is the capability which he has actually, but his building a house is that which he does not have actually.

One might raise the question why, then, it is impossible for him to be white in so far as he is a doctor. The answer might be again, I think, that what is not is not a

mere privation, but has a potentiality which is capable of something. His emphasis is the capability of potentiality. Not anything can come from anything, but something can come from something which is capable of becoming that very something.

The problem of what is coming from what is might be answered far more easily. We say that what is comes from what is when, for example, a particular animal comes from a particular animal, namely, a dog comes from a dog, but not from any kind of animal. Aristotle continues to say,

> It will not come from what is any more than it will come from what is-not (namely, as we have said, in so far as the latter is-not). (*Phy*. 191b23-24)

In effect, this problem is already examined when we discussed the priority of actuality in time. That is, a puppy comes from matter which is actually in an actuality, a dog, but which is potentiality since it is not yet a puppy. Therefore, it might be concluded that a puppy that is an actually existing or what is comes from a dog that is an actually existing or what is. Thus, as we have so far seen, it is obvious that, although Aristotle attempts to settle many problems with the distinction between actuality and potentiality, these problems are not sufficiently solved.

To sum up: in this chapter we have so far focused on the possibility of change in terms of privation and potentiality. We have defined the notion of privation as a mere empty space which is still not capable of changing but which designates a possibility in another sense; that is, it is a pre-condition for change. Since an empty space or a mere possibility is not sufficient for there to be change we have expected from the notion of potentiality the role of enabling the possible change to be actual. However, although Aristotle defines change as the actualisation of potentiality we are still not entitled to claim to have discovered what makes the potentiality be

actualised. Accordingly, we are to pertinently endeavour to find out the real source of change in the rest of our examination later on.

Chapter IV

Nature, *aitia*, and Chance

How can there be change of natural substances? What are the conditions for the change? These questions are what we have endeavoured to answer and we might be now entitled to claim the possibility of change by adopting Aristotle's notions, such as privation and potentiality, that have been so far examined. These notions are inner principles that make beings capable of changing rather than external factors that cause change. And it is undeniable that Aristotle is indeed more interested in inner causes than in external causes.

In the *Physics* II.1, by distinguishing things that exist by nature from those that exist by other causes Aristotle briefly presents the distinction between things which have in themselves a source of movement or rest and things which do not. That is, he thinks that there are two types of beings in nature, natural beings and artefacts, and that the change of natural beings is due to their nature. Therefore, it might be worthwhile to enquire into the question on what grounds Aristotle claims that only natural beings are able to change by themselves and what are the characteristics of nature by examining his distinction between natural beings and artefacts.

Aristotle's other interest in relation to the notion of nature is whether there is any other factor that causes change. He introduces the four causes or explanatory factors, the formal, the material, the efficient, and the final. Thus, in the second section of chapter IV we shall consider the status or role of the four *aitiai* in change. And, the next question that Aristotle enquire into is whether there is any event which is unexpected, that is, which occurs by chance. Obviously, if it is proved that there are events occurring by chance, Aristotle's whole theory of change might lose the ground on which it is based. For since, as we have seen, Aristotle

conceives that for a thing to change there must be a privation in it and the potentiality of acting, if there is any chance event, it might seem that, even though there were no privation and potentiality, there might still be the possibility of change.

IV.1 The Characteristics of Nature

For Aristotle, the fact that there is nature in some beings is obvious, and need not be proved (*Phy*. 193a4-5). And the characteristics of such a nature must be that of being a cause since it is compared with other "causes". From Aristotle's belief that natural substances have "in themselves" tendencies to change, it might well be assumed that it is an internal principle rather than external. By contrast, it seems clear that other causes are external, for if artefacts do not have in themselves such tendencies they require a certain cause from outside for there to be change. It is also true that apart from the controversial question whether there is any change without direct contact they seem to require to some extent direct and contagious forces to cause change.

> Among beings, some are formed by nature, some by other causes. Among those formed by nature, we may name animals and their parts, plants, and the simple bodies (earth, fire, air, and water): all of these, together with beings like them, we call "formed by nature." Observation discloses how they differ from things not constituted by nature: each of them has within itself a beginning of movement and rest, whether the "movement" [or specific type of behaviour] is a local motion, growth or decline, or a qualitative change. Such is not the case with things like beds and clothes: that is to say, to the extent that these come within the classification of "products of art", they do not have implanted within themselves any tendency to change; nevertheless, in so far as they happen to consist of stone or earth or a composite material, they do have such a beginning of movement and rest, but only in this respect. (*Phy*. 192b8-22)

In the passage above, Aristotle divides beings in nature into two types, natural substances which have tendencies to change and artefacts which do not; that is to say, the criterion of Aristotle's distinction between the two types of beings, between natural substances and artefacts, is whether they possess a nature to change or not, or whether they are formed by nature or by other causes.

At this stage, one might raise the question whether Aristotle wishes to say that artefacts do not change at all if they have no tendencies to change. In the passage quoted above, he shows that if they are composed of the simple bodies, such as water, earth, and so on, they do have these tendencies. In effect, the statement "artefacts which do not have implanted within themselves any tendency to change are able to change in so far as they consist of stone or earth or a composite material" seems vacuous since it is hardly plausible to say that there is an artefact which is not composed of any of them. Therefore, if what Aristotle implies is merely that artefacts which are not composed of any of the simple bodies do not have within themselves tendencies to change, then it follows that all artefacts have these tendencies. That is, it is absurd to say that, for example, if a bed made of wood remains without being affected by other external forces, it will permanently be without any change. It is plain that, even though not caused by any of the forces, the bed will become rotten as time passes. Thus, to some extent artefacts seem to have a nature to change.

One might be also curious to what extent wood can be said to be that which is not transformed into anything and persists through change since Aristotle maintains that wood, bronze, earth, and so forth are the nature of a subject for they remain continuously through its changing conditions (*Phy*. 193a17-23). A bed also to some extent persists through change; e.g. a bed here at one time is there at another time. Conversely, when wood is burnt, it becomes charcoal which is no longer called wood. And therefore the difference between wood and a bed seems only to be that wood is likely to last for a longer period of time than the bed. Nonetheless,

there might be no objection to saying that some matter that persists through change seems to have a nature (*Phy*. 193a28-30). For in changing there should be something in which a nature consists. However, the example of a wooden bed raises the question whether the nature is of an artefact (a bed) or of matter (wood). We shall discuss this point later on.

As we have examined in the previous chapter on an argument on the notion of potentiality, Aristotle has no doubt that everything in nature, whether it has a soul or not, has both the potentiality of acting and of being acted on. It is plain that the potentiality of being acted on is common to all beings since whatever changes [moves] is changed [moved] by something else or by itself *qua* other (*Phy*. VIII 3). For if they did not have this potentiality, then they would not be capable of acting. However, although Aristotle does also claim that the potentiality of acting is in everything, he seems to hesitate to claim that it plays the same role in natural substances and artefacts. It is obvious that the artefacts, too, have the potentiality of changing others, but conditionally, not absolutely; they do not change others spontaneously, but do only when they are changed by something else for they lack the tendency to change (192b19). For example, an arrow does not change spontaneously as such. But it causes a bird to fly when it is fired by a man. In this sense, since it does not have in itself any tendency to move spontaneously the arrow is capable of changing others only when it is moved by an external force, namely, a man's shooting using a bow. Aristotle says elsewhere,

> ... of the things which are moved essentially, some are moved by themselves, whereas others are moved by something else; and some are moved naturally whereas others are moved "contrary to nature" or violently. (254b14-17)

It is plain that he means artefacts by 'others'. Then, the suggestion of this passage is that artefacts not moving spontaneously is their nature, whereas the nature of the other substances, so-called natural substances, is to move spontaneously. Again,

that artefacts being moved is 'contrary to nature' does not mean that they do not have nature at all, but indicates that they do not have the nature to be moved. Thus, we may conclude that what artefacts do not have is the nature to change spontaneously but they have the nature to change conditionally or to be changed. To sum up, a question of how an arrow that does not possess a nature to change enables a bird to fly might be easily answered; that is, the arrow has a nature "to change non-spontaneously", but has a nature to change when it is caused to do so by an external force. However, there still remains the same question, as it appeared in an earlier stage, whether the nature to change 'non-spontaneously' is of artefacts or of the matter which constitute the arrow.

Let us now turn to the question whose nature it is in an example of a bed being rotten. Aristotle answers that a bed being rotten is the nature of wood (*Phy.* 193a10-31) rather than that of a bed (See 192b2-22).

> Now, some hold that the nature or the primary being of natural beings is their proximate constituent by itself, apart from any arrangement of it: the nature of a bed, they say, is wood and, of a statue, bronze. As Antiphon suggests, by way of giving a clue to this interpretation: bury a bed and let it rot until it gets enough power to send forth a shoot, this shoot would not be a bed but wood.; hence, the bed's arrangement by convention and by art is only incidental to it, whereas its primary being is what remains continuously through its changing conditions! ... This is the reason why some declare earth, others fire or air or water, and still others some or all of these elements, to be the nature of beings. (193a10-24)

One might be curious how far it is possible for us to discriminate matter, wood, from an artefact, a bed, and why a bed lacks a nature? If the criterion of the distinction between natural substances and artefacts is that the former are organic unities whereas the latter are not, does he mean that wood is an organic unity? To say that a bed being rotten is the nature of wood rather than that of bed is because

"the bed is an artefact, the wood not".[21] That is, wood being rotten is, as we shall see later on, due to its being an organic unity derived from its essence. It seems to follow that for a substance to be said to have essence no form or whatsoever should be given to matter; that is, a substance which is composed of form and matter should remain as such without being made, or without being artificial. However, since the form of a bed is imposed on matter, e.g. wood, by a craftsman Aristotle would say that the bed cannot have any essence at all. For essence is not that which is given to a being, but that which is always present in the thing. Then, it follows that the essence which seems to belong to an artefact is the essence of the matter of the artefact rather than that of the artefact itself.[22] Thus, it might be concluded that artefacts themselves do not strictly change at all and that their seeming change is in effect the change of the matter which constitutes the artefact. For artefacts do not have any essence. All the same, what persists is from the nature of matter, not from the nature of an artefact. For, as mentioned, there cannot be any change without presupposing matter. Thus, Aristotle says that some matter that persists through change seems to have a nature (*Phy.* 193a28-30). For there should be something in which a nature consists. Let us sum up our position reached so far in Aristotle's own remarks.

'Nature' means the primary material of which any natural object consists or out of which it is made, which is relatively unshaped and cannot be changed from its own potency, as e.g. bronze is said to be the nature of a statue and of bronze utensils, and wood the nature of wooden things; and so in all other cases; for when a product is made out of these materials, the first matter is preserved throughout.... 'Nature' means the essence of natural objects, as with those who say the nature is the primary mode of composition ... Hence as regards the things that are or come to be by nature.

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[21] Waterlow, op.cit., p. 55.

[22] Although, at this stage, it seems to be said that the essence is of matter which constitutes an artefact the essence and the matter are not identified. For essence has two aspects, matter and form as nature does. Further discussion on this point will be done in chapter V.1.

though that from which they naturally come to be or are is already present, we say they have not their nature yet, unless they have their form or shape. (*Met.* 1014b27-1015a5)

In the passage above, Aristotle shows that for a thing to be said to be formed by nature it should have form as well as matter. He says in the *Physics* that nature is called form more appropriately than material (193b8-9). If Aristotle's usage of the word "nature" implies, as we have seen, "non-artificial", then the nature in a thing must mean essence: to have whatever it has to have. He expounds here again the view that the difference between natural substances and artefacts is that the former are capable of generating the same genus as themselves, whereas the latter are not. For example, man generates man, whereas a bed is not produced by a bed.

How can, then, natural substances have such internal tendencies, while artefacts do not? Aristotle's answer seems to be that the nature of natural substances to change is due to their essence. In other words, their nature comes from their essence.

'Nature' means ... The source from which the primary movement in each natural object is present in it in virtue of its own essence. ... Organic unity differs from contact: for in the latter case there need not be anything besides the contact, but in organic unities there is something identical in both parts, which makes them grow together instead of merely touching, and be one in respect of continuity and quantity, though not of quality. (*Met.* 1014b19-26)

There might be diverse explanations of a man's shooting an arrow; because he wants to catch a bird, or because he was simply bored, or the like. However, any of them hardly seem to show the immediate source of his capability to take such an action. It is therefore probable that Aristotle reaches the conclusion that natural substances have within themselves tendencies to change because they are organic unities, which in turn is derived from their essence. As we shall closely see in the final chapter, essence is defined as what it is for a thing to be. Therefore, the nature to change which natural substances have is that which they possess essentially, not

that which is attained at some point in their existence. In brief, from the examination so far it thus seems clear that Aristotle connects nature with essence and therefore the nature of natural substances can be said to be their attaining the final form that they are to be. To sum up, for Aristotle nature has two meanings, form and matter (*Phy*. 194a13-15); nature is an actual being as well as a potential being since matter is a potentiality to be actualised as a form, an actuality.

... the matter is called the nature because it is qualified to receive this, and processes of becoming and growing are called nature because they are movements proceeding from this. And nature in this sense is the source of the movement of natural objects, being present in them somehow, either potentially or in complete reality. (*Met*. 1015a15-19)

In concluding the argument on the characteristics of nature as it stands, there might be two questions that one might enquire into: (1) if nature is to complete what it is for a thing to be, how can, then, he answer to the happenings, such as a deformed baby being born or unexpected mutation? (2) is there any difference between nature and essence or do they have the same characteristics? The answers might be expected respectively (1) in analysing Aristotle's thesis on chance events in chapter IV.3 and (2) Aristotle's theory of 'for the sake of something' in chapter V.1.

IV.2 The Four Types of *aitia*

It is hardly plausible to say that in two different languages there are two words whose meanings are exactly matched to each other. And therefore in translating the Greek word *aition* or *aitia* into English many commentators show different opinions. Most commentators such as Guthrie, Ross, and Irwin translate it as cause, Hope and Taylor as explanation or explanatory factors, and Lear as fashion. Using the term 'cause' is a direct translation from the Greek word and the choice of

the term 'explanation' seems to entirely depend on Aristotle's statement that his aim for the argument on the *aitia* is to attain knowledge why a thing changes in such-and-such a way (*Phy.* 194b20-22) or why change happens to a thing. On the other hand, Lear's terminology 'fashion' seems to be a different point of view from other commentators. He says that "what he [Aristotle] actually cites are not four causes but four fashions in which we cite the cause".[23] His usage of the word seems to be merely another expression of 'explanation' but to show the limitation of our linguistic expression. Although it is undeniable that all the commentators endeavour to find the most adequate word which transmits the exact meaning of the Greek word without losing the original meaning, none of them seem successful. Probably, the best way to avoid that kind of a problem might be of course to use the Greek word as it is used. But it does not seem to be an absolute solution for the problem since the meaning of the word might also be equivocal. The main reason for this problem occurring is that Aristotle begins his argument on *aitia* with saying that his aim is to know the 'why' of change.

There is obviously a difference between describing a thing's changing and explaining the process of the change, or why it happens. That is to say, in a change there must be an unobservable factor as well as an observable one, whereas in explaining a change we are fundamentally to depend on our sensory perceptions to explain a change. It is therefore undeniable that in many cases the process of Aristotle's reasoning leaves us the problem of how it is possible for us to advance on such areas from our ordinary experience; the process from the *experienceable* facts to the *inexperienceable*.

Since Aristotle, nonetheless, attempts to cover or express both the areas with one word '*aitia*' it is natural that we are confused by the word translated into English. Thus, although it is true to say that, as Ackrill says[24], Aristotle's doctrine of the

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[23] J. Lear, *Aristotle: the desire to understand* (Cambridge: Cambridge University Press, 1988), p. 27.

[24] J.L. Ackrill, *Aristotle the Philosopher* (Oxford: Oxford University Press, 1981), p. 36.

causes might better be called a doctrine of the four 'becauses' we are in effect required to use both the English words 'cause' and 'explanation' or 'explanatory factor' where it is appropriate in accordance with the context.

Bearing this point in mind, let us begin our argument with citing Aristotle's expounding the four types of the *aitia*.

"An explanatory factor," then, means (1) from one point of view, the material constituent from which a thing comes; for example, the bronze of a statue, the silver of a cup, and their kinds. From another point of view, (2) the form or pattern of a thing, that is, the reason (and the kind of reason) which explains what it was to be that thing; for example, the factors in an octave are based on the ratio of two to one and, in general, on number. This kind of factor is found in the parts of a definition. Again, (3) the agent whereby a change or a state of rest is first produced; for example, an adviser is "responsible" for a plan, a father "causes" his child, and, in general, any maker "causes" what he makes, and any agent causes what it changes. Again, (4) the end or the where-for; so, when we take a walk for the sake of our health, and someone asks us why we are walking, we answer, "in order to be healthy," and thus we think we have explained our action. So any intermediate means to the end of a series of acts; for example, as means of health there are reducing, purging, drugs, instruments, and so forth; for all these are for an end, though they differ from one another in that some are instruments, and others are actions. (*Phy*. 194b24-195a3)

What Aristotle shows in this passage is that in explaining a thing's change, namely, an event, there are four types of explanatory factors, material, formal, efficient, and final factors. At first sight, for us who normally associate a cause with an effect, the efficient factor seems to be the most proper cause to explain a thing's change since for the other factors it is hard to see what are immediate factors to cause a change. For Aristotle, what is coming to be is from something which already exists and, if there is not anything, nothing can be produced (*Met*. 1032b30-31). Therefore, it is natural for him to assume that there already is at least matter before something is

brought about, and this 'something' is present potentially in the matter. Thus, causes are related to something that exists.

At this stage, one might raise a question whether the four causes are applied to all beings, things formed by nature and those formed by other causes. To answer this question we have to examine whether the causes are external or internal. For if natural beings' capability to change is an inner principle of change, then the natural beings do not seem to require any external cause for their change. As we shall see at once, Aristotelian causes seem to be internal causes as well as external causes which designate Humean causes.

Aristotle's adopting the two explanatory factors, material and formal, is presumably derived from his analysis of nature. In an earlier stage, the claim has been examined that natural beings have in themselves natures to change, while artefacts do not. Nature which is an inner principle of change, and which presupposes a subject, has two aspects, form and matter. It is plain that, in order to explain why a thing changes in such-and-such a way, Aristotle first needs to say that the change is because a thing is composed of form and matter, which are two different aspects of nature, since he defines nature as a source of change. Again, a thing changes in such-and-such a way since it has a source of change. Thus, for Aristotle the formal and the material play the roles of explanatory factors rather than causes which directly cause beings to change since he says nature which has two aspects, form and matter, is innate in things.

Another sort of Aristotelian explanatory factor, the final, might be understood with reference to his assumption that, as we shall closely see in the next chapter, nature does nothing in vain and tends toward an end (*Phy.* 194a26-27) as well as toward what is best (195a25). Since the most characteristic mark of nature has been defined as the completion of a thing's being what it has to be it is plain that this also plays a role of an explanatory factor as an inner principle of change. However, one thing we should note here is that Aristotle expounds the formal and the final as external causes by identifying the former with the latter (199a20-33). For example,

when a sculptor produces a form of a statue for the aiming at producing the statue his forming as well as his aiming at are said to be explanatory factors. Ross says,

'Form' for Aristotle embraces a variety of meanings. Sometimes it is used of sensible shape, as when the sculptor is said to impose a new form on his material. .....The form is the plan of structure considered as informing a particular product of nature or of art. The final explanatory *factor*[25] is the same plan considered as not yet embodied in the particular thing but as aimed at by nature or of art.[26]

To assume the formal and the final explanatory as external is problematic for, if nature which is said to be a source of changing which natural substances have within themselves designates a source of changing spontaneously, they do not seem to require any external force to become what it is for a thing to be, but Aristotle does believe in that nature is not absolutely capable of doing so but sometimes needs the assistance of art, which may well be thought of an external force, to become what it is for a thing to be. Aristotle says that the role of art is to complete what nature is unable to carry to a finish (*Phy.* 199a12-29)

As examined in the previous section, Aristotle distinguishes natural substances from artefacts according to whether they are formed by nature or by other causes (192b8). If the former are also changed by other causes which we have defined as external, then the distinction between the two types of things is no longer obvious. In other words, Aristotle has emphasised that things which are not affected by other causes are said to be formed by nature; that is to say, only such things are capable of changing spontaneously. And if this is true, why should natural substances require other causes? Certainly, without form and matter, no natural thing is capable of coming into being. And also, without an end related to the two, that

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[25] I replace Ross' translation 'cause' with 'explanatory factor' for the purpose of showing consistency in this work.

[4] W.D. Ross, *Aristotle* London: Methuen and New York: Barnes & Noble, 1964), p. 74.

which comes to be would be random; for example, man would not always come from man but sometimes from dogs, or from horses, or the like. Thus, it is clear that the three factors so far examined are involved in natural beings and the beings need not require other external forces to become as they are. Therefore, we might conclude the formal and the final explanatory factors can be that which nature has as well as that which can be imposed on matter by external forces.

We are now in a position to examine the nature of the efficient factor. Although Ross claims that the final as well as the efficient are adequately expressed by 'cause' in English,[27] the latter seems to be the better candidate for a cause for our present: purpose to discriminate a cause which is external and immediate from that which is not. Since, in the passage cited above concerning Aristotle's defining the four explanatory factors, the example of the efficient is a father's causing his child we naturally assume that Aristotelian efficient cause does not seem to be different from Humean causation which concerns a cause, a father, with an effect, his child, with reference to time, namely, the priority of a cause.[28] However, Charlton points out this as a misunderstanding, caused by our being accustomed to the conception of Humean causation[29]. Charlton's ground for the claim is according to the following passage;

> ... the operating and individual causes exist and cease to exist simultaneously with their effect (for example, this man actually healing is correlative with this man who is now being healed, and this actual builder, with this thing-being-now-built); but potentially they do not exist together (for the house and the builder do not perish with the act of building). (*Phy.* 195b15-22)

Charlton in particular pays attention to the phrase, "causes being simultaneous with their effects", which is contrasted with Humean causes that are prior to their effect.

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[27] Ibid., p. 73.
[28] D. Hume, 'A Treatise Concerning Human Nature', A.J. Ayer and R. Wynch, *British Empirical Philosophers* (London: Routledge and Kegan Paul, 1965) p. 359.
[29] W. Charlton, *Aristotle's Physics I&II* (Oxford: Clarendon Press, 1970), p. 101.

How can there be a cause and an effect at the same time? To answer this question, we are required to examine Aristotle's usage of the two terms, cause and effect. As the passage cited above shows, Aristotle calls the potentiality of acting a cause and that of being acted on an effect. As analysed in an earlier discussion of the notion of potentiality, for Aristotle, for change to be possible the potentiality of acting and that of being acted on should be matched and they tend toward one and the same actualisation. And they are simultaneous, otherwise they will not meet each other and there is no possibility that they can be matched. It is, therefore, plain that "the actualising of the two potentialities is not two separate events but one and the same event".[30]

On the other hand, the potentiality of acting which Aristotle might call a cause is not a cause in the Humean sense. Aristotle in effect distinguishes the potential cause from the actual cause, merely capable of acting from actually in operation.

> ... any factor, whether essential or accidental, may be actually in operation or merely capable of acting: a house being built is the work of "builders." but more actually of the builder who is building it. (*Phy*. 195b5-8)

For Hume causation is invisible. He says that "the only one that can be traced beyond our senses... which we do not see or feel is causation".[31] However, Aristotelian actual cause is that which is visible; that is, when a builder builds a house his activity of building is empirically observable.

In brief, summing up the differences between Aristotelian and Humean cause discussed so far might be helpful to grasp the characteristics of Aristotelian efficient cause. The differences are (1) that Aristotelian cause and its effect are simultaneous, whereas Humean cause is prior in time to its effect, (2) that Aristotelian cause and effect are one and the same event since both of them move

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[30] Lear, op.cit., p. 32.
[31] Hume in *British Empirical Philosophers*, p. 358.

towards actualising one and the same event, whereas Humean cause and effect are two events since the connection called causation is, he thinks, derived from an idea of connecting two events, and (3) that for Aristotle the connection between causes and effects is visible, whereas Humean causation is invisible.

In consequence, among the four explanatory factors the formal, the matter, and the final factors are inner principles of change rather than external. And, the former two factors are respectively potentiality and actuality and the latter is actuality. On the other hand, the efficient factor involves potentiality as well as actuality. Except for the efficient factor the rest of them seem to be explanatory factors which explain why change happens rather than causes which brings about change. However, since the efficient factor is closely connected with the formal and the final factors, in order to determine whether the efficient factor is entitled to be called a cause which is external, we are indeed required to examine the relation between the other three factors. Thus, for this reason, although we have here treated Aristotelian four explanatory factors individually the relation between them should be examined. This task will be done in chapter V.1 in an argument on Aristotle's conception of 'for the sake of something".

IV.3 Chance Events

Given the fact that the four factors are applied to explain a thing's changing, Aristotle now goes on to consider whether there is any possibility of a thing's changing by chance or by luck; that is to say, he concentrates on analysing whether luck and chance are also explanatory factors for events other than the four factors analysed in the previous section.

It is obvious that we do not always observe all the causal chains of phenomena, and therefore we are sometimes not able to explain them properly. Nonetheless, it seems also plausible for Aristotle to say that it is always possible to find some

explanation other than luck (*Phy*. 196a6-7) to describe why a change occurs. For, in many cases, even though we do not clearly see the precise and adequate explanatory factors for change, there are still observable phenomena in changing. Otherwise, we are not qualified to claim that there is change or that there seems no immediate cause of the event.

Before we begin our discussion on Aristotle's conceptions of chance and of luck, it is to be noted that Aristotle's main aim in analysing them is not to examine whether or not they are causes but how they are to be classified in relation to the four explanatory factors, the material, the formal, the efficient, and the final (*Phy*. 196b9-10). In effect, Aristotle does not seem to have any doubt that luck and chance are explanatory factors.

... chance and luck... Both belong to the type of "explanatory factors" whence comes the beginning of movement. They are always a sort of factor operating either by nature or by design, although the number of these is indeterminate. (198a1-5)

The famous example of Aristotle's showing a chance event is a creditor's going to a market and, as a result, recovering a debt from his debtor.

Suppose, for example, that a creditor would have gone to a market to recover his loan had he known that his debtor was there, but he happened to go there for another purpose with the result that he got his money, although it was not his usual or invariable practice [as it might have been for someone else] to go to the place where the two men met: the result (getting the money) is, like any object of deliberate choice, a factor external to the agent; and we say that the event happened by luck [relatively to the normal case], for we would not say this if he had gone there regularly or normally for the purpose of soliciting funds. (196b34-197a6)

Since prediction is applied to things happening always or for the most part (197a19) Aristotle ascribes unpredictable results, or results which are different from

expectation, to chance or to luck; that is, chance or lucky events are neither always nor for the most part. In order to grasp what Aristotle suggests in the passage above, it might be helpful to distinguish the following cases:

(1) A goes to a market with a purpose to look for B.

(2) A goes to a market with another purpose.

(3) Whenever A goes to a market, A meets B.

(4) Even if A always goes to a market, A has never met B. But this time A meets B.

(5) A who hardly goes to a market goes there and meets B.

Obviously, (3) is not called a chance event in Aristotle's terminology. For Aristotle would not call an event happening always or for the most part a chance event. He says,

> We observe that some events always occur in the same way and some usually so. Evidently, we do not ascribe either of these two classes of events to luck; nor do random events happen in the same way either necessarily and always or even for the most part... Evidently, then, there is such a thing as luck or chance... (*Phy*. 196b10-18)

On the other hand, according to Aristotle's passage quoted above, (5) seems to be the most proper happening by chance or by luck since it meets the two conditions, neither always nor for the most part. However, it is to be noted that Aristotle tries to establish that chance events are in the sphere of things done with some purpose or end (196b30). Thus, (5) should be understood in connection with a purpose. And the purpose here means A's or B's "intention". That is to say, only if neither A nor B have any intention to meet each other does their seeing each other satisfy Aristotle's condition for a chance event. Hence, (2) and (5) together seem to constitute a chance event. Ackrill says,

If you go to the market to buy food and happen to meet a man who owes you money - when to collect the debt was not your motive for going, and when the man is not a regular market-goer - that is your good luck.[32]

However, Ackrill does not point out other possibilities suggested by Aristotle's example. Suppose that, even though A knows that B must be in a market called C, A by mistake looks for B in a market D and meets B. What is this event called and by what cause can this be explained? It is undeniable that this event also seems to happen by chance or by luck for, even though A has expected to see B, B's being in a market D is in effect unpredictable. Therefore, it is not necessarily required that A must have another purpose other than the purpose to meet B. Aristotle, too, claims that luck or chance is unpredictable since "prediction applies to what is always or for the most part (197a18-19)" but, by the same example, this claim might be denied. That is, even though the result of A's meeting B is aimed at by both it could still be called a chance or lucky event in the sense that it happens neither always nor for the most part. Thus, although Aristotle would say that (2) and (5) together are sufficient conditions for a chance event the condition (1) that A goes to a market with the very purpose to look for B might be also part of a chance event.

Let us now consider the case of (4). As mentioned, according to Ackrill's as well as Aristotle's passage, for a creditor's collection of his debt to be a chance event, he must not go to a market regularly. However, if A goes to a market regularly it need not make an event non-accidental, in so far as A does not always or for the most part meet B in the market. Thus, if an event satisfies the conditions (1) or (2) and (4) or (5) it deserves to be called a chance event.

Let us now examine how the potentialities of acting and of being acted on are applied to chance events. "It must be qualified by the explanation ," says Guthrie,

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[32]. Ackrill, op.cit., p. 39.

"that by chance we mean an incidental result from a regular chain of causation which was directed at some other end."[33] Guthrie's interpretation of Aristotelian chance event here suggests that an event can be so called in so far as the result of the event is different from one's expectation or purpose, and in so far as the result is not regular, that is, in so far as the result occurs neither always or for the most part. It seems true to say that chance events have some causes. However, since an event appears different from "our expectation" we call it "a chance event". This point can be supported by Ross's statements that "chance is not an operative cause but only a name for a certain kind of connexion between events"[34] or that "chance is simply a name for the unforeseen meeting of two chains of rigorous causation".[35] These two statements suggest that chance is merely a description of an explanatory factor rather than a cause.

However, even if these two commentators' interpretation is correct for Aristotle's conception of chance Aristotle's account still does not seem to be successful in covering every possibility. For example, A who marries B gives birth to a baby C who is deformed. If nobody expects that C will be deformed, then C must be a chance event. Presumably, Aristotle would say that one of the parents has the potentiality of acting and the other that of being acted on, and that one of them is the cause of begetting a deformed baby C. But suppose B has some disease discovered later on, which always causes him to produce a deformed baby, whereas A is normal. In other words, B's potentiality of acting might lead always or for the most part to C but A's potentiality of being acted on does not normally lead to C. Or again, let us take the example of A's meeting B unexpectedly. Although A who knows that B will be in a market at 8 a.m. goes to the market to meet B on time, if B does not expect to meet A, their meeting is still a chance event from B's point of

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33. W.K.C. Guthrie. *A History of Greek Philosophy* Vol.VI. (Cambridge: Cambridge University Press, 1981), p. 240.
34. Ross, op.cit., p. 76.
35. Ibid., p. 78.

view, whereas it is not a chance event for A. In other words, questions can be raised about the extent to which the outcome is unexpected.

We have analysed Aristotelian chance events and reached the conclusion that Aristotle's theory is not wholly adequate. To sum up: Aristotle would call it a chance event (1) that a result is different from one's expectation or purpose and (2) that the result occurs neither always nor for the most part. However, if chance is a description of an explanatory factor rather than a cause in its own right, (1) and (2) are not sufficient to define a chance event. For (a) there can be an event which is a chance event for A but which is not a chance event for B and (b) there can be an event which fits A's purpose and which does not seem to him a chance event but which is a chance event, say the result of a wrong decision, such as going to a market D thinking of it as a market C, and so on.

Thus, although Aristotle's theory of chance events need be supplemented Aristotle's claim that chance or luck is not a further kind of explanatory factor over and above the four explanatory factors discussed in the previous section seems plausible. The questions why A meets B in a market and why a deformed baby C is born can be answered respectively because A goes to the market where B is there or the reverse and because one or both of C's parents has/have a defect. As emphasised in the previous section, there is obviously a difference between a thing's happening and to know why it happens, or to explain the process of change. Thus, it might be true that, if there were somebody who sees the mechanism of two events, there would be nothing happening by chance or luck.

Aristotle who expounds the theory of chance events goes on to argue, if chance events occur neither always nor for the most part, then what are the events that occur always or for the most part and how they can occur so. And this process of reasoning calls for the essence of beings in relation to Aristotelian teleology which we shall examine in the following chapter.

Chapter V

Aristotle's Conception of 'for the sake of something' and Natural Agency

Before beginning our analysis of the Aristotelian conception of 'for the sake of something', it might be helpful to sum up our discussion so far in order to grasp the connection between the former issues and the issue which will be discussed here. We have mainly focused on the questions, such as (1) on what grounds Aristotle can claim that there is a possibility of change in nature, i.e. the problem of change coming from what-is or what-is-not, (2) where does change start from, i.e. the genesis of change, (3) what conditions there are for a thing to change, i.e. the notion of privation and potentiality, (4) what are the characteristics of nature which is said to be a source of change, and (5) whether that which changes is changed by something else or by itself.

It is also to be recalled that we have endeavoured to search for the sources of change according to Aristotle's course of reasoning as it appeared in the *Physics*. And, among the principles of change nature seems to be a better candidate for being called the source of change than the other principles, privation and potentiality, in the sense that it is, as we have examined in chapter IV.1, some tendency to be a form of something which has within itself a beginning of movement (*Phy*. 193b4-5). In other words, nature is an immediate source of change, whereas the other principles are, if beings have no nature or are caused by art, a mere state of change in beings which might remain without any change at all. It is in effect hard to describe the difference between nature and the other principles since the latter, too, are absolutely necessary for change to be possible. The difference might be explained in this way. Nature is 'a moving cause' which is capable of bringing about change in so far as there is a subject which involves the other principles. On the

other hand, even though a subject involves the other principles there cannot be any change unless it has a nature to move. Once again, nature is a principle of change or rest, whereas the others are only principles of rest.

However, it is still obscure where the nature of beings comes from. Indeed, this is a question about the source of nature, namely, the source of the source of change. It might be vacuous to say that some beings naturally have nature unless it is also answered how or from what they can have it.

Many difficulties remaining undiscovered, at this stage we are to search for the answer to the question of the source of change from Aristotle's conception of 'for the sake of something', namely, the final explanatory factor, which is in some cases identified with the formal and the efficient factor. For since we have examined Aristotle's diverse, and presumed, principles of change it might be, I believe, reasonable to take a backward step from the end of change in searching for the 'real', or more immediate, source of change. In addition, since Aristotle identifies 'for the sake of something' with the essence we shall pay considerable attention to defining the nature of it.

Our next discussion will be concentrated on examining what kinds of sources Aristotle conceives there are other than the sources which have discussed. In effect, as we shall see in the main discussion, he introduces as effecting change to some extent some other factors, e.g. desire or will, in the *Metaphysics* 1048a14 and, e.g. nutrition, sensation, thinking, and so on, throughout the *De Anima*. To grasp the proper sources of change in beings, we are required to examine the factors with reference to Aristotle's division of beings in nature. For, if he only divides beings, as he does in the *Physics* II.1, into two types, i.e. natural beings and artefacts, but does not further subdivide the former into smaller groups, such as humans, non-human animals, plants, and the like, he cannot help being reproved by some commentators, e.g. Waterlow,[36] for regarding "all the natural substances as

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[36] Waterlow, op.cit., p. 30.

purposeful agents". Therefore, we shall mainly focus on the question whether he divides beings in nature and, if he does, how or with what criterion he does so should be questioned. For whether Aristotle can be defended or not against such a reproach wholly depends, I believe, on his division of beings in nature.

As it may well be noted, this is the last stage of our discussion as regards the problem of change and the questions which will be enquired into in this chapter are closely related to the other theses discussed in earlier chapters. Thus, although I will try not to duplicate the theories examined so far, some of them might be required to some extent to recapitulate our earlier discussion related to the questions raised here and to develop further ideas on the problem.

V.1 Aristotle's conception of 'for the sake of something'

It is a natural process of reasoning for human beings to assume that since there is a beginning of change there must be an end of it as well. They are two termini of change, from something to something else. And it is undeniable that the two notions, *terminus a quo* and *terminus ad quem*, are to be thought of with regard to the conception of change which necessarily presupposes a subject which persists throughout the change. Aristotle, who begins his analysis of change by examining the possibility of it, endeavours to expound, in particular, in the *Physics* II.8 the view that all natural processes as well as human activities are 'for the sake of something'.

> ... Hence, there must be among natural beings and products such as exist or come into existence to some end. Again, in any procedure which has an end, what comes first and what comes next are performed for that end. But as in human operations, so in natural processes; and as in processes, so in human operations (unless something interferes). Human operations are for an end, hence natural processes are so too. (*Phy*. 199a2-12)

There might be two extreme theses about describing a thing's changing; (1) whatever changes changes by chance and (2) whatever changes changes for a purpose. The former does not seem quite plausible since, for example, my writing this chapter is not for nothing but for something, namely, I am writing this for the purpose of examining the validity of Aristotle's conception of finality and, say, for an MPhil degree. In other words, I have, at least, an intention to show in this chapter what a thing's changing is towards or if change is towards anything. Thus, the thesis that everything happens by chance is not valid since there are obvious examples which show intended actions directed to a purpose.

How far, then, is it plausible to claim that everything moves towards an end? Nature for Aristotle does nothing without a purpose (*Cael.* 271a33). In other words, as shown in the passage cited above, he seems to believe that all the events in nature happen for some end or purpose or for the sake of something. Although it is true that, as Gotthelf points out,[37] "Aristotle nowhere clearly states the definition of what it is to be (or come to be) 'for the sake of something'" it seems still possible for us to attempt to find what is it that a thing moves towards from Aristotle's remarks on this point in the *Physics* II.2 and 8.

> ... it is evident that there is such a factor [as an "end"] in natural processes and beings. Further, since "nature" is double, meaning either "material" or "form", and the latter is the end, everything else being for the sake of the end, the "form" will be the For What aimed at. (*Phys.* 199a29-33, see also 194a27-31)

Aristotle here shows he is identifying the final with the formal explanatory factor. Furthermore, in the *Physics* II.7 he mentions that among the four explanatory

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[37]A. Gotthelf, 'Aristotle's Conception of Final Causality', in A. Gotthelf and J.G. Lennox (eds.) *Philosophical Issues in Aristotle' Biology* (Cambridge: Cambridge University Press, 1987), pp. 204-205.

factors, the formal, the material, the efficient, and the final, the three other than the material are reduced to one individual substance.

Often the three factors coincide. "What" something is and "to what end" it is, may be the same; and a prime mover may be identical with these factors in form or species, since man generates man, and so with moved movers generally. (198a25-28)

Thus, in defining Aristotle's conception of 'for the sake of something' it might be a reasonable start to approach the conception by examining the relation among the three factors; that is, in what sense they are reducible to one.

Let us question by citing again Aristotle's definition of the four factors in what sense the formal, the efficient, and the final may coincide.

'Cause' means (1) that from which, as immanent material, a thing comes into being, e.g. the bronze is the cause of the statue and the silver of the saucer, and so are the classes which include these. (2) The form or pattern, i.e. the definition of the essence, and the classes which include this... and the parts included in the definition. (3) That from which the change or the resting from change first begins; e.g. the adviser is a cause of the action, and the father a cause of the child, and in general the maker a cause of the thing made and the change-producing of the changing. (4) The end, i.e. for the sake of which a thing is; e.g. health is the cause of walking. For 'why does one walk?' we say; 'that one may be healthy'; and in speaking thus we think we have given the cause. (*Met.* 1013a27-35)[38]

Why the material factor should be excluded from being identified with the other three factors might be found from the distinction between form and matter which we have endeavoured to define in chapter III.1 and, partially, in chapter IV.2 in the discussion of the four factors. Material substances are composed of form and

[38] This passage is duplicated in the *Physics* 194b25-195a 3.

matter. This distinction does not seem to be so difficult in so far as we are capable of separating matter from form in our thought. That is, it is true that, as Aristotle notices (*Phy.* 193b6), the form of a substance which is the compound of matter and form is not actually separable from its matter. They are distinguished only by a process of our mental analysis. Nonetheless, to explain a substance's changing in terms of the Aristotelian material factor, we are to differentiate the form from the matter, and the reverse. Therefore, Aristotle says that matter is potentiality and form actuality (*De An.* 412a10; *Met.* 1050a16-17) for matter might come to attain its form (*Met.* 1050a15-17). Even though this clause is construed as saying that matter which has a certain form might reach another form there seems, at this stage, to be an obstacle to understanding it as, although it is untrue, matter which does not originally have any form at all comes to have a certain form. In brief, according to Geach's terminology,[39] the matter might be defined as what the compound is formed from and the form as what makes what a thing is made of into that thing. Thus, they are two factors which constitute a substance but are not to be identified with each other.

Let us now turn to our main discussion of the relation among the three factors, the formal, the efficient, and the final, which are, according to Aristotle, identified with one another. Firstly, as for the formal factor, to say the form is the definition of the essence is construed that a man, for example, should be such by definition; that is, a man is called a man when he is perfect. In other words, it may well be said that a man, who has two hands and feet, a face with two eyes and a nose with two nostrils, and the like, deserves to be so called. One might raise the question whether Aristotle wishes to suggest that a man who has only one hand, namely, who is defective [or who is not perfect], is no longer a man. This is indeed a question of what is the essence of a man; that is, what makes a man a man. Suppose a man's arm was cut off in an accident. Do we call the arm a man? We

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[39] Anscombe, in G.E.M. Anscombe and P.T. Geach, *Three Philosophers* (Oxford: Blackwell, 1961), p. 49.

might be inclined to call it a cut arm or a human arm rather than a human. But if the rest of the man's body is still to be called a man, then it shows that a man's having two arms is not part of the essence of human. Thus, what is to be questioned here is what characteristics make up the essence of a man.

Let us take once again the example of man's generating man. Although it is true that Aristotle regards the generating in general as part of the essence of man he does not seem to conceive of man's generating males or man's generating females as acts involving different essences. In other words, the fact that man is capable of generating man, whether it is a male or a female, might be part of the essence but man's generating a male or a female is not part of the essence in the sense that it is not the case that man always generates males or always females. Indeed, generating a male or a female happens at random. Then, this seems to be a property of attributes rather than of essences since attributes are defined as something which may or may not be involved in a subject. In other words, not all predicates of a thing are part of the essence. In that sense, Anscombe points out that, according to the Aristotelian conception of essence, all the characteristics which constitute a thing are not part of its essence. She says,

> Now it is true that Aristotle explains the accidental as the non-necessary, and that predicates belonging to the 'what it is to be that' of a thing are necessary; but that does not justify us in identifying the latter with necessary predicates; for he does not hold that all necessary predicates enter into the definition. This would be suggested by the identification of the accidental with the non-essential. ....[40]

When a sperm of a human meets a womb of a human it becomes a new human since, Aristotle would put it, the essence of the two is to be human. Here, I do not intend to question which of them gives matter and which of them form. However,

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[40] Anscombe, op.cit., p. 35.

it is clear that a human cannot be completed only by one of them. Thus, both are necessary factors to be a human. It is undeniable that all the formal factors and the essence of natural beings are discovered after we observe what happens under certain circumstances in the sense that, unless we do observe, we will never be able to discern essences from attributes, although the essence is that which already is in the beings without reference to our observation. In other words, what we conceive of as man's generating a human essence is that which we can find out from many events of human procreation which happen always or for the most part and, presumably, in the same way; that is to say, if a human essence has been created it should be "always or for the most part" the case that man generates man. Thus, it seems worthwhile to apply to the notion of essence the two phrases, always and for the most part, which are opposed to the characteristics of Aristotelian chance events.

However, apart from our ability to observe the essences of things, the difficulty remaining here is that there is still some possibility that a thing has some other part of the essence which is not known to us. Therefore, since it is true that, as Anscombe states, not all predicates are involved in defining a thing it is undeniable that knowing all the predicates which describe a thing is not sufficient for us to know its essence. One has to select amongst the properties. The same difficulty might appear when an object is observed since a selection must be made from its observable properties; that is, if something happens only sometimes, we are not able to ascribe it to part of the essence of a thing. But, although it is not an absolute answer to the search for essence it is reasonable for Aristotle to suggest that we restrict ourselves to something known or present in objects in searching for essences.

The object of the inquiry is most easily overlooked where one term is not expressly predicated of another (e.g. when we inquire 'what man is'), because we do not distinguish and do not say definitely that certain elements make up a certain whole. But we must articulate our meaning

before we begin to inquire; ... Since we must have the existence of the thing as something given, clearly the question is *why* the matter is some definite thing; e.g. why are these materials a house? Because that which was the essence of a house is present. ... (*Met.* VII. 17)

As we have so far discussed, it is reasonable to presume that Aristotle's conception of the form as an explanatory factor is of a thing's completing what it meant for a thing to be by definition (*Phy.* 198b8). Again, the formal factor is that a thing becomes what it is to be derived from its essence.

Let us sum up our discussion so far. The essence is something that is in substances, and it is said to be what it is for a thing to be of that sort. However, the properties observed might or might not be an essential part of the thing. Conversely, since the essence of a thing does not depend on our observation there might be part of the essence of the thing which we do not observe and do not know. Apart from many difficulties raised above in searching for the real essence of substances, it seems plausible to say that the formal factor is identified with the essence 'by definition'.

Given the characteristics of the formal factor, let us now analyse the final factor. As stated, the final is defined as the end or the where-for (*Phy.* 194b33). Aristotle elsewhere says,

... everything that comes to be moves towards a principle, i.e. an end (for that for the sake of which a thing is, is its principle, and the becoming is for the sake of the end), and the actuality is the end, and it is for the sake of this that the potency is acquired. For animals do not see in order that they may have sight, but they may have sight, but they have sight that they may see. (*Met.* 1050a6-12)

It is to be recalled that Aristotle constantly maintains that the substance or form is actuality which is present in the agents, e.g. the act of seeing is in the seeing subject (1050a30-b6). And also, there is no product apart from actuality (1050a35). As

we have closely analysed in the discussion of the notion of potentiality, the priority of actuality to potentiality is mainly based on Aristotle's thought that coming to be is not from what-is-not absolutely but from something which persists through change; that is, he supposes a subject which has existed and which will continue to exist. In the example of man's generating man, namely, in a substantial change, we do not expect that Aristotle's answer to the question of what is it that persists would be that it is the man who already is. At this stage, one might be curious in what sense, then, the former man who already is and the latter man who is generated later on, namely, the end, are said to be identified. This is again a question about the essence of man, as enquired into in examining the characteristics of the formal factor. In the passage of the *Metaphysics* quoted above, Aristotle assumes that the end is also actuality as the is form. That is to say, the form of a human, namely, actuality, is the end which a new human will finally attain. For anything to come to be, there must already exist a perfect example to be its actuality[41] since, as we have analysed in the discussion of the notion of potentiality, for Aristotle actuality is prior to potentiality.

All the same, to say that the formal factor identified with the essence, and again with the final cause, is to be identified with the efficient cause should be understood this way. Aristotle defines the efficient factor as "the agent whereby a change or a state of rest is first produced (*Phy.* 194b29-30)" and conceives of a father as 'causing' his child. That is, when a human generates a new human the latter is different from the former; that is, it is absurd to say that my father and I, for example, are the same. However, the two are the same in the sense that they have the same form of human and that they fall under the same species, namely, human. Thus, what Aristotle means by the conception of 'for the sake something' is to attain the form of what a thing is to be.

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[41] Guthrie, op.cit., p. 225.

As it may well be noted, in this section we have mainly concentrated on the three factors in terms only of the generation of natural agencies, but not of artificial things. However, for a proper gasp of the notion of essence it might be helpful to examine briefly the essence of artefacts, too. Aristotle relates "shape" or "form" to "nature" (193a31) and explains that man's generating man is according to man's nature (193b9). It might not be difficult to understand that man's forming the final shape is from the essence of man. However, when this is applied to artefacts it is more complicated. For, when there is a chair made of wood by a craftsman, we should determine whether the essence is of wood or of a craftsman. At first sight, since Aristotle often shows that the efficient factor of artefacts which is identified with the formal factor, again with the essence, is the mind of a craftsman his answer to this enquiry seems obvious that the essence is of a craftsman. For artefacts do not have within themselves a beginning of movement (193b4) which signifies the capability of forming what it is for a thing to be. But producing an artefact is not a matter of the relation between a craftsman and an artefact, but between a craftsman and a material. Thus, it is worthwhile to enquire into why the essence is of a craftsman. It is undeniable that, when the chair is completed by a craftsman, the form is the final cause of the chair. It is not the case that a chair comes into existence from a chair, but from wood or from a craftsman. And since the form identified with the essence is also identified with the nature which is a source of movement that natural beings have within themselves a chair which does not have such a nature cannot have essence. But it is still hard to understand why the essence is the essence of a craftsman. A problem arising here is, as opposed to the definition of Aristotelian essence, that a craftsman's producing a chair does not always happen, namely, he produces a chair, a bed, a wardrobe, and so on, and that wood is not only matter of a chair but of diverse artefacts. It might be argued that wood being produced as certain artefacts might be an essence of wood and craftsmen making artefacts the essence of craftsmen. However, wood being this particular chair or a craftsman's making this particular chair hardly seems to be from

any of their essence. Thus, whether or not the essence is said to be of wood or of a craftsman, an artefact's being produced seems indeed to be an attribute rather than an essence.

Although we have seen that the three factors, the formal, the efficient, and the final, which explain why there is change in a thing are identified with one another in terms of the essence it should be noted that, as Martin points out, they are not exactly the same.

> The form should not be confused with the essence. The essence is what the definition defines: so since the definition of a human being includes his or her being a material thing, the essence will include matter. The substantial form, which is introduced precisely in terms of that which makes a lump of matter to be a thing of a certain kind, does not. [42]

In an earlier stage of this section V.1, we have seen that the form and the matter of a thing cannot be actually separated. Thus, if the essence of a thing is defined as 'the what-it-is-to-be-that-thing'[43] for a thing to be as such it should include matter as well as form since a thing is composed of matter and form. That is to say, in the definition of a thing to be what it is there are form and matter. This seems to follow that the notion of essence is identified with nature in the sense that both of them have two meanings, matter and form (*Phy* 193a30-b41). However, they are differentiated in the sense that the former designates a state of stasis, whereas the latter designates a state of movement and of rest. In other words, the essence is expressed by predicates of beings which the beings should have in order to become what they are to be. However, it does not follow that in the essence there is any power of completion. Aristotle seems to conceive that the essence is not something that can be attained but something that is always present in the beings. However,

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[42] Martin, op.cit., p. 69.
[43] Guthrie, op.cit., p. 147.

he nowhere in the *Metaphysics* discusses whether there is any power in the essence itself.

> ... in one sense the 'being' meant is 'what a thing is' or a 'this', and in another sense it means a quality of quantity or one of the other things that are predicated as these are. ... Now there are several senses in which a thing is said to be first; ... (1) in definition also this is first; for in the definition of each term the definition of its substance must be present. (*Met.* VII.1)

It is difficult to determine how or whether the conditions, potentiality, nature, and so on, are involved in essence and, when essence involves those conditions which are sources of movement, the essence can have a tendency to change in it. Among the conditions, the characteristics of nature is similar to those of essence. However, nature is not wholly identified with essence.

Martin[44] does admit that the two notions have a different meaning. On the other hand, however, he seems to regard them as the same. "Another word for essence," he says, "is nature: this has a slightly different nuance, and signifies an essence in so far as it is the originating principle of actions". As discussed above, there is a radical difference between the two terms; essence does not seem to appear to have any power to move, whereas, according to Aristotle in the *Physics* II.1, nature obviously has power. In an article in the "Oyster Club",[45] Martin describes essence in terms of 'tendency' and says that "a tendency is a sort of power since something that has a tendency to become F can be F. ... A tendency to be F at least means a potentiality to be F". However, he does not give a sufficient account of the link between essence and tendency. Although it is true that a potentiality is closely related with its exercise, potentiality does not seem to be identified with the latter since between the potentiality of being actualised and the actualisation of it there

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[44] Martin, op.cit., p. 70.

[45] This is an annual departmental paper published by the Department of Philosophy, University of Glasgow, 1992.

should be some power for the potentiality to be actual. Furthermore, when we discuss the characteristics of essence, the other conditions for change, such as potentiality and nature, are excluded. That is, at this stage we do not analyse the essence of a thing assuming that those conditions are given to the thing but separate it from them, as we separate form from matter in the discussion of form. In effect, we do not find any moving source from the essence in itself. In brief, for Martin to say that essence is some sort of power he has to show what the power is. In any case essence and nature are not identified.

In consequence, from Aristotle's conception of 'for the sake of something' which coincides with the formal and the efficient it is clear that 'for the sake of something' is a thing's becoming what it is to be. And, to know what is it that a thing is to be is, according to Aristotle, to know the essence of it (*Met.* 1031b19-20). This suggests that, unless we know the essence of it, we are unable to understand what a thing changes for, or what the 'something' is. It is anyhow true that the completion of a thing's essence designates its process towards being perfect, for essence is by definition what it is for a thing to be. We might now reach the conclusion that the essence of natural beings is a necessary condition, though not sufficient, for a being to change. For a being to change it must have its essence which involves the other conditions, such as privation, potentiality, and nature. In other words, the change of a being is said to be "a fulfilment of its tendency"[46] in so far as the being is under these conditions.

Given almost all the possible conditions for beings to change, we are now in the position to question whether Aristotle thinks that all natural beings have the same conditions for change and whether there are any other sources to determine their movements or tendencies.

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[46] Geach in *Three Philosophers*, p. 105.

V.2 Natural Agency

Although the essence of a being is always present in the thing without reference to our observation it is undeniable that our *ascribing* the essence to a being is on the whole dependent on our observation. However, not all the appearances of a being will be all the essence of the being since some of them might be attributes; nor can all the essence of it be observable. Therefore, although Aristotle's conception of 'for the sake of something' seems clear in that it designates the completion of the what-it-is-to-be for a thing, what it is may still be obscure to us.

However, despite the fact that there still remains this sort of difficulty in knowing the essence of beings as such, since we are only humans and since we are not capable of seeing directly the inner structures of how beings are organised or what the real essence of beings are. we cannot but search for their essence from the phenomena which are possible for us to observe. To search for something obscure or something which we are not able to observe directly, as Aristotle suggests (*Phy*. 184a6-184b16), we must begin our examination by enquiring into something which is intelligible and familiar to us. In consequence, we cannot but admit that the phenomena of beings which occur always or for the most part, rather than, sometimes are a clue to their essence. Our position so far might be summed up by Geach's remarks;

> To recognise the persistent identity of a thing, we must be able to pick out from the general flux of events the contribution made by that thing's operations; ...we have no intuitive insight as to which propositions of this kind hold good, but must proceed inductively.[47]

Thus, we cannot help our looking at the movement of natural beings other than humans as directed towards an end from an anthropomorphic vision in so far as we

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[47] Ibid., p. 101.

are humans. Therefore, it is to some extent understandable for Aristotle to explain natural processes in relation to human movements.

... as in human operations, so in natural processes; and as in processes, so in human operations (unless something interferes). Human operations are for an end, hence natural processes are so too. (*Phy*. 199a9-11)

This passage clearly shows that Aristotle's reasoning that natural processes are for an end is derived from his observing the fact that human actions are for an end.

Beings in nature might be first divided on the whole into animate and inanimate ones.[48] And the former are again divided into moving (again into human beings and non-human animals) and non-moving beings (plants), and the latter into non-artificial beings, e.g. a stone, and artificial ones , e.g. a chair. However, as we shall see later on, Aristotle in the *Physics* II.1 divides beings into natural beings and artificial ones. The main criterion of the division is whether they have within themselves tendencies to change. And those with a tendency towards change, change for the sake of something (194b33-195a2). As it may well be noted, what Aristotle means by an end of change is not that a change merely 'comes to an end', but that it is 'for an end'. Thus, to say that natural beings move towards an end gives an impression that non-human animals, plants, and, even, the simple bodies might have purposes as humans do.

However, considering that Aristotle obviously emphasises in the *Physics* I.1 that to research into nature we must start from what is apparent to us it is quite doubtful whether Aristotle does claim that we should understand that movements of natural beings in the same way as those of humans. For it is hard to assume that he does not notice the difference between, for example, animals and plants, or the simple bodies. If he does regard all the natural beings as acting in the same way without

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[48] Cf. A. Kenny, *The Metaphysics of Mind* (Oxford: Clarendon Press, 1989), p. 34.

further subdividing them into humans, non-human animals, plants, and so on, his division will be immediately faced such a question as how natural beings other than humans can also be able to perform a deliberate activity.

Aristotle writes in the *Physics* II.1,

> Among those formed by nature, we may name animals and their parts, plants, and the simple bodies (earth, fire, air, and water): all of these, together with beings like them, we call "formed by nature." Observation discloses how they differ from things not constituted by nature: each of them has within itself a beginning of movement and rest; whether the "movement" [or specific type of behaviour] is a local motion, growth or decline, or a qualitative change. (192b8-15)

This passage explicitly shows that Aristotle conceives of all natural beings as self-movers, able to move by themselves. If so, they do not require any sort of external conditions and the role of the external conditions might be "that of permitting the change or not hindering it".[49] Unfortunately Aristotle here draws no distinction between the natural beings. Therefore the passage does nothing to counter the impression that all the movements of natural beings, such as a stone's falling, an animal's jumping, a plant's rooting, and the like, can be understood in terms of intended activities.

To the question whether Aristotle does not see the difference in respect of purposiveness between a human and a plant, an animal and a stone, or the like, Waterlow answers thus;

> Aristotle himself would dismiss as fanciful the attribution of intention and deliberation to plants and animals; but is not the attribution of autonomous natures in the sense explained a similar mistake: one, moreover, that loses its rationale once we cease to regard all natural substances as purposeful agents? ... Aristotle saw as clearly as anyone that to interpret animal and plant

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[49] Waterlow, op.cit., p. 29.

behaviour as deliberate explains nothing that could not be well explained without it; whereas to deny natures and natural changes would for him be tantamount to denying the very possibility of all explanation.[50]

It is undeniable that for Aristotle the notion of nature is absolutely necessary. For nature is an originative source of change which allows the possibility of self-movers. However, it is doubtful whether Aristotle's conception of nature is equally applied to all natural beings. Waterlow's statements seem to imply that Aristotle's theory of nature is valid in so far as he looks at all natural beings with the same vision, namely, an anthropomorphic vision. Then, what is questionable here is whether Aristotle's theory of nature loses its grounds in case he classifies, or divides, natural beings into several groups, such as humans, non-human animals, plants, and the simple bodies. Thus, in this section we shall mainly enquire into two questions, whether Aristotle further subdivides natural beings and whether his division of them prevents him from claiming that all natural beings have within themselves a nature to move.

Before beginning our analysis of these points, let us first consider what Aristotle means by saying that even the movements of natural beings are also changed by something else which seems to run counter to the claim that they are self-movers.

Since some things, then, are both potential and actual, though not at the same time and in the same respect - but (for example) what is potentially hot is actually cold, therefore such things will act upon or be acted upon by one another in many ways (for everything is capable both of acting and of being acted upon). Hence, too, every mover which is a physical agent is moved; indeed, every mover of this sort moves by being itself in movement. It seems to some that every mover is a moved mover. (*Phy*. 201a20-26)

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[50] Ibid., pp. 30-31.

In chapter III.2, we have considered in what sense the two types of potentialities, of acting and being acted on, are said to be in a being. On the whole, among two beings, one which has a potentiality of acting plays a role of an agent and the other which has a potentiality of being acted on of a patient. However, with this explanation Aristotle is unable to maintain the theory that there are self-movers. Therefore, he holds that there can be the two potentialities in a being. In an example of a doctor's healing himself, he has the potentiality of healing himself as a doctor as well as that of being healed as a patient. Thus, for Aristotle self-moving is still possible.

It is to be noted that this sort of potentiality is different from a mere possibility. That is to say, the potentially of acting should coincide with the potentiality of being acted on. And, the fact that the potentiality of acting always seeks for that of being acted on is now described as a natural tendency. Geach expounds this as follows;

> We must be careful not to regard natural tendencies as mere potentialities. For, first, there are often potentialities in a situation in which, given the agents actually present, there is no corresponding tendency. ..... Again, if tendencies are to be regarded as mere potentialities, then what actually happens will be the resultant of a lot of things that would happen if only there were not other things that would happen if... and at that rate nothing would ever actually happen. ..... A tendency for something to happen is different from its actually happening; but yet a tendency is somehow actual, not a mere potentiality, a 'would happen if'.[51]

To begin with, let us examine Aristotle's division of beings in nature in the *Physics*. Aristotle divides beings into those which have life and those which are lifeless. It is

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[51] Geach, op.cit., p. 104. Geach's usage of the term 'potentiality' here seems to designate a mere 'possibility' in the ordinary sense rather than potentiality in Aristotle's terminology; whereas the meaning of 'tendency' fits for Aristotelian potentiality. That is, Aristotelian potentiality is not a mere possibility, but something that will be actualised in so far as it meets a proper opposite potentiality and in so far as it is not hindered.

to be recalled that for Aristotle nature is not only of a source of movement, but also of rest (*Phy*. 192b13). Aristotle holds that natural beings are sometimes in movement and sometimes at rest (254a17-18) and divides them into two groups; (1) that admit of both movements and rest, and (2) that are always subject to movement (254b7-10). And, the beings grouped in (2) are moved 'naturally' or 'violently' by something else; that is, fire's moving upward and a stone's falling downward are natural movements, whereas fire's being moved downward and a stone's being moved upward are violent movements.

Surely, they cannot set themselves in motion, any more than they can bring themselves to a stop, as animals can. ... It would, moreover, be unreasonable to suppose that, if [elements] moved of their own accord, they would be capable of only a single kind of self-initiated "movement". ... nothing naturally unitary [like fire, and so forth] can be self-moving, any more than can anything else that is continuous; ... nonliving things are [even in their natural movements] moved by something. ... Fire and earth, then, are forcibly moved by some agent in ways at variance with their nature; they are moved naturally when they are impelled to pass from their respective potential states to their corresponding activities. (*Phy*. 255a7-32)

At this point, what is worth questioning is in what sense, then, all natural beings have in themselves a nature to move? That means that they are capable of actualising, or of changing, when their potentialities of being acted on meet the appropriate potentialities of acting, and the reverse. Aristotle says,

Thus, a lever moves a weight by main force, whereas a body which is actually hot can act in accordance with this very nature upon a body which is potentially hot; and so forth. Just so, a body can be acted upon in accordance with its nature if it is potentially of a certain sort or so much or somewhere... (255a23-26)

Aristotle's expression that "natural beings have within themselves a tendency to change" means that they are capable of changing in accordance with their potentialities given to them from their essence. In other words, all the natural beings have a tendency to move 'according to nature' in the ordinary sense, not 'contrary to nature'.

Apart from the classifications of natural beings discussed so far into living and non-living beings, Aristotle in the *De Anima* divides living beings, such as plants, non-human animals, and humans, in accordance with their soul. Soul might be characterised as three types; (i) the nutritive and reproductive soul, (ii) the sentient soul, and (iii) the rational soul.[52] The nutritive soul is in all living beings to preserve their existence and, when living things have become what they are to be, the most natural act is to reproduce their new generation as themselves (*De An.* 415a22-b2). On the other hand, the sentient soul is only in animate beings, animals and humans, and it is a cause of an animal's movement; sight, hearing, taste, touch, and so on are involved in the soul. Since plants and inanimate animals are unable to move they look for nutrition to preserve their life from the soil to which they belong. On the other hand, since animals are not able to take nutrition from the soil but are able to move they move around to look for food. However, it is no use for an animal to move about unless it can recognise its food when it finds it.[53] Finally, there is one more sort of soul which is possessed only by humans, that is, the rational soul. According to Aristotle, appetite and mind are derived from thought which is a faculty of the rational soul. As regards the role of the soul, he explains as follows;

> The soul is the cause or source of the living body. The terms cause and source have many senses. But the soul is the cause of its body alike in all three senses which we explicitly recognize. It is (a) the source or origin of movement, it is (b) the end, it is (c) the essence of the whole living body. ... in everything the essence is identical with the ground of its being, and here, in the case of living

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[52] G.R.G. Mure, *Aristotle* (Westport Connecticut: Greenwood Press, 1975), p. 97.
[53] Ross, op.cit., p. 130.

things, their being is to live, and of their being and their living the soul in them is the cause or source. Further, the actuality of whatever is potential is identical with its formulable essence. (*De An.* 415b8-14)

As shown, the soul is also a source of movement and seems to be involved in the essence of living beings rather than another source apart from it. In other words, the essence of living beings is to live and the source of living is now defined as the soul in the beings.

Although we have not discussed at large the property of and the connection between the faculties of each soul it has been clearly confirmed from Aristotle's division of souls which depend on the essence of living beings that he does not regard all the movements of the beings other than humans as the same as humans who are purposeful agents.

In effect, in the *Nicomachean Ethics* Aristotle explicitly states that only the actions done by humans from their anger or appetite are called voluntary.

... Presumably acts done by reason of anger or appetite are not rightly called involuntary. For in the first place, on that showing none of the other animals will act voluntarily, nor will children; and secondly, is it meant that we do not do voluntarily any of the acts that are due to appetite or anger, or that we do the noble acts voluntarily and the base acts involuntarily? Is not this absurd, when one and the same thing is the cause?... and therefore also the actions which proceed from anger or appetite are the man's actions. (*N.E.* 1111a21-b3)

It is to be noted that, although Aristotle ascribes voluntary actions to humans, he excludes children from the humans who are capable of acting voluntarily. He relates the voluntary action with choice and thinks that children are not capable of making a proper choice (*N.E.* 1111b4-9) since choice involves a rational principle and thought (1112a16-17).

Ross[54] interprets Aristotelian voluntary actions as follows; "action is voluntary, then, when (I) its origin is in the agent, and (2) he knows the circumstances in which the act is done." However, if one thinks that the two conditions are sufficient for Aristotelian voluntary actions it is misleading. For, it is undeniable that the origin of actions done by non-human animals and children is in them and that they might sometimes, though not always, understand why they act in the way they do. Does, then, Aristotle call their actions voluntary? In effect, Aristotle's remarks on this point are confusing since to some extent he seems to call the actions of animals voluntary.

Choice, then, seems to be voluntary, but not the same thing as the voluntary; the latter extends more widely. For both children and the lower animals share in voluntary action, but not in choice, and acts done on the spur of the moment we describe as voluntary, but not as chosen. (*N.E.* 1111b7-9)

At this point, then, we have to divide voluntary actions into two types, those from anger and appetite and those related to choice which involves a rational principle and thought.

Those who say it is appetite or anger or wish or a kind of opinion do not seem to be right. For choice is not common to irrational creatures as well, but appetite and anger are. Again, the incontinent man acts with appetite, but not with choice; while the continent man on the contrary acts with choice, but not with appetite. Again, appetite is contrary to choice, but not appetite to appetite. Again, appetite relates to the pleasant and the painful, choice neither to the painful nor to the pleasant. Still less is it anger; for acts due to anger are thought to be less than any others of choice. ..... What, then, or what kind of thing is it, since it is none of the things we have mentioned? It seems to be voluntary, but not all that is voluntary to be an object of choice. Is it,

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[54] Ibid., p. 198.

then, what has been decided on by previous deliberation? At any rate choice involves a rational principle and thought... (*N.E.* 1111b10-1112a17)

As discussed so far, Aristotle does not have any doubt that plants, non-human animals, and humans are living beings and that among them there are animate beings, namely, self-movers, and inanimate beings. And animate beings can have voluntary actions in the sense that they are self-movers. However, deliberate, or intended, actions related to reason, or thought, can be ascribed only to humans other than children. Clark's quotations might make this point clear:

Proairesis is deliberative desire (*N.E.* 1139a23). Man is the only one of the animals that deliberates (*Hist. An.* 488b24). Neither children nor beasts (alike in many ways: *Hist. An.* 588a33f.) can 'act', only one who has reflected (*E.E.* 1224a28). They lack *Proairesis* because they lack the ability to deliberate and 'the concept of "why"' (*E.E.* 1226b23f.).[55]

Consequently, there seems to be no difficulty for Aristotle in applying the notion of nature to all natural beings. The common nature of all the beings is that they have the potentiality of being acted on. And therefore, when they are caused by the appropriate potentiality of acting they are able to be changed. And, this sort of nature is possessed by the simple bodies, too. Allan sketches Aristotle's use of the word 'nature' thus:

It may mean (1) the original state of a thing, as opposed to its state when modified by culture and education, and hence those tendencies in any growing thing which are first displayed, as opposed to others not less natural which come out at a later stage: and (2) the acme of development, which is reached when every inherent capacity has been brought out... Nature may also mean (3) the

[55] S.R.L. Clark, *Aristotle' Man* (Oxford: Clarendon Press, 1975), p.22. At the beginning of the book, Clark shows his doubt whether *Hist. An.* (*Historia Animalium*) is Aristotle's original work.

power of spontaneous movement and change, as opposed to movement which is induced from without, or by force, and (4) the total aggregate of bodies which display such movement.[56]

In the passage, Allan seems to think that being moved by force is not a meaning of nature in Aristotle. However, as we have so far seen, Aristotle divides movements into two types, natural movements and violent movements (*Phy.* VIII.4). In effect, for Aristotle what is moved is moved by something else or by something *qua* itself. Therefore, in a strict sense for him it seems that nothing moves spontaneously. However, of the things which are moved essentially "some are moved by themselves, whereas others are moved by something else; and some are moved naturally, whereas others are moved 'contrary to nature' or violently (Phy. 254b14-17)". What is moved naturally may be also moved violently. As for the simple bodies, for example, a stone's falling downward and fire's moving upward are said to be moved naturally, whereas a stone's falling downward and fire's moving downward are the examples of being moved violently. Those which are moved by themselves *qua* themselves can be called self-movers.

On the other hand, as for all living beings, the nature that they have in common is self-maintenance and reproduction derived from their soul, and, again, from their essence. In addition to these characteristics of nature, non-human animals as well as humans have sensation. However, non-human animals do not have thought. It is a peculiar property of nature which humans only possess.

In brief, when among natural beings those which always have to be moved by something else are so moved the movement is a natural movement for them. And such a movement is from their nature. And also, when those which are capable of being moved by themselves *qua* themselves are so moved their movements are said to be self-movements and those movements are according to their nature. Thus, by showing the common nature of all natural beings and the hierarchy of the soul in

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[56] D.J. Allan, *The Philosophy of Aristotle* (Oxford: Oxford University Press, 1970), p. 24.

living beings Aristotle is able to maintain his theory of self-movers, as opposed to Waterlow's understanding that Aristotle loses his grounds for the theory of nature once we cease to regard all natural substances as purposeful agents. With regard to the argument so far, Wieland's statement is worth reading: "Aristotle's speaking of the way in which the natural world is ordered for man's benefit should not be, therefore, interpreted as implying a universal teleology".[57]

[57] W. Wieland, 'The Problem of Teleology', in J. Barnes, M. Schofield, and R. Sorabji (eds.) *Articles on Aristotle* Vol. 1 (London: Duckworth, 1975), P. 153 & p. 158.

Conclusion

For Aristotle who pertinently emphasises the fact that change is observable, there should be a subject that persists through all change. Otherwise, we would not be able to observe, or notice, that there is any change. For this reason, Aristotle ascribes the Presocratics' claim that nothing can come from *what is* or from *what is not* to their misunderstanding of the two terms, *what is* and *what is not*. That is to say, he thinks that it is not the case that *what is* comes from *what is* absolutely or from *what is not* absolutely, but that there must be an underlying subject which has a privation in change.

Change is from something to something else or to something different and that very 'something' is that which persists through the change; change occurs between a pair of contraries, between something and something else, e.g. between heat and cold. And such change is only possible to material substances that are composed of form and matter; change is not from 'heat-ness' to 'cold-ness' but from 'something' hot to 'something' cold. However, if the substances designate those which are perfect or which are already formed what they are to be, there might be no possibility that they require any change. For this reason, Aristotle supposes that they should be in a state of lacking, or privation. Consequently, he considers change as filling in the state of privation; that is, something which is not hot (something which is in a state of lacking being hot) can become hot. Thus, by adopting the notion of privation he can claim that substances are capable of changing.

With regard to the notion, Aristotle goes further to claim that change is not from 'anything' to 'anything' but from 'something' to 'something'. Thus there appears the notion of potentialities of acting and being acted on. For example, it is not the case that anybody is capable of healing a patient but that somebody who is capable of

healing can heal a patient, that is, in so far as the 'somebody' is a doctor who is capable of healing. Similarly, not anybody can be healed but somebody can be healed in so far as the 'somebody' is capable of being healed.

However, there still remains the problem of how, then, the 'somebodies' are capable of acting and of being acted on. Aristotle answers that it is because they have in themselves a source of movement and rest. Since he maintains that whatever moves is moved by something else or by itself, what is common to all natural beings, the simple bodies, plants, and animals, is the nature of being moved. Furthermore, as we have seen in analysing the notion of nature, Aristotle thinks that nature is differently applied to living beings in accordance with their soul; that is, Aristotle ascribes some other characteristics to the nature of living beings. The nature of maintaining their existence and reproducing is the common characteristics of plants and animals including humans. However, the nature of will or desire in relation to 'choice' is only common to humans other than children. Thus, for one to attribute the notion of nature to all natural beings the nature of being moved is the better candidate among the hierarchy of natures.

Apart from the source of change, nature, we have examined whether the four types of *aitia* are other sources of change and concluded that they are rather explanatory factors than real sources which effect change and that, although they are related to change, they are the secondary sources which are next to nature. Thus, nature is the primary and immediate source which is closely related to beings' movements.

The next question we have endeavoured to answer is where, then, the nature of beings comes from. Aristotle conceives of natural beings' nature as coming from their essence (*Met.* 1014b20-21). Therefore, we have attempted to examine what essence is with reference to Aristotle's conception of 'for the sake of something'. Essence is said to be what it is for a thing to be or, according to Geach, a fulfilment of tendency.

Then, it is clear that for change to be possible the essence of beings include all the preconditions, and sources, for change. In other words, for the change of natural beings to be possible they must be composed of form and matter, be in a state of privation, have in themselves a nature to change, and so on. And therefore it might be true to say that the total sum of the conditions of beings stated above can be identified with the conception of essence. That is to say, if essence does not satisfy any of the conditions it cannot be referred to as essence.

Although Aristotle conceives that essence is that which is always present in natural beings, and not that which can be attained, he fails to give us an answer to the question of how this essence is to be present in the beings. It is not sufficient for anyone to answer that the essence of beings is that which is 'essentially' or 'naturally' in them. A prerequisite for Aristotle's theory of change to be complete is to find an answer to the question, such as what is the origin of essence, what are the grounds for saying that there is essence in natural beings, or what are the preconditions for essence to be present in natural beings. Therefore, to enquire into such a question is that which Aristotle leaves us to pursue.

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