

ARISTOTLE ON CHANCE AND SPONTANEITY
(*PHYSICS*, BOOK 2)

I.

As we know the first and the second book of the *Physics* deal with principles and causes. Physics is, just like the metaphysics, per analogiam with the first philosophy, the science of first principles and causes, επιστήμη τῶν πρώτων αρχῶν καὶ αἰτιῶν¹.

The Alpha book of *Physics*, which can be read together with the *Metaphysics*, represents pure philosophical part of the text and this can be seen from the outline of the first two books. Whereas in the Alpha book a theory of nature as a principle (αρχή) is developed, we find in the Beta book a theory of nature as a cause (αἰτία). The science of physics/nature (επιστήμη περὶ φύσεως) is one of three theoretical philosophies (τρεῖς φιλοσοφίαι θεωρητικάι), together with theology and mathematics². However, it will be characterized as the second philosophy (δευτέρα φιλοσοφία) relating only to lower things, that is natural bodies which have in them a source (αρχή) of movement and rest — the special subject of its research are physical things (τὰ φύσει ὄντα).

But, nevertheless, speaking about nature also means to research principles and causes. Without this science we perhaps wouldn't have the first philosophy and in a sense the *Physics* actually is the first philosophy, especially if we take the legendary bibliothetic saying about "sequence" of both book literally. Somehow the *Physics* is the first philosophy and in a way only second, and here Schellings beautiful remark comes to mind: "To philosophize about nature is equal to creating it."

The B book of the *Physics* will be, therefore, concerned with Aristotle's theory of causality, and that is exactly the theory, which we know as his theory of four causes (also presented in the *Metaphysics*).

The main purpose of this book is to determine how many kinds of cause must be taken into account. Aristotle introduces two further "causal categories", already presented in Greek popular and mythical thought, but not yet recognized for their scientific or any other reasonable validity. So for the first time in Greek antiquity happens that the concepts of chance (τύχη) and spontaneity (τὸ αὐτόματον) are introduced not merely as a result of an empty belief that events just "happen" by some blind working forces from behind, without any participation of human or other mind. Instead they are viewed in a respectful conceptualized manner, as opposed to people, who believe that chance is a cause, but that it is inscrutable to human intelligence, as being a divine thing and full of enigmas.

The causes are four and they remain a constant topic of B book, whose function is exactly to develop systematically a causational theory that would be able to explain the processes in nature. Aristotle is rejecting the Democritean mechanistic view and his absolutization of necessity (τὸ ἐξ ἀνάγκης) and is trying, as we know, to prove the existence of teleology in nature (τὸ οὐ ἔνεκα). Annotating to nature the dimension of teleology and not necessity it becomes clear that the category of chance will come to light, which was totally redundant in the model of nature as necessary processes. Necessity and chance are excluding each other — postulating one of them means necessarily denying another. It is widely known that it was Aristotle who founded the teleological explanation of nature, which surpasses the dichotomy between nature (φύσις) nad law (νόμος) — indeed *telos* is a kind of law of nature (νόμος τῆς φύσεως), but teleological construction is no longer dependent on the creator (as in Plato) for this "law" is somehow immanent to nature.

But in the case of maintaining that teleology exists in nature we must also explain some deviations of our teleological "image" of nature, whose existence is evident³.

II.

The question of chance and spontaneity will interfere with the line of causally explainable events, however always exceedingly connected with the final cause. A special dilemma is whether causes should be

understand hierarachaly or not in a sense that *causa finalis* is eliminated as the most relevant one. Thomas Aquinas seems to be close to this solution. Anyway, the component of *telos* is of the utmost importance for an apprehension of these two categories, for it seems that they are both the unforeseen result of end-orientated events. Aristotle uses two synonymous expressions for the teleology of nature. Thus in the *Physics* asserts: ἡ φύσις τέλος καὶ οὐδ' ἔνεκα (but the nature is the end or "that for the sake of which"⁴). But this two notions must be additionally linked to the third one, and that is the good as such. So it is not surprising that in the A book of the *Metaphysics* he enumerates as the fourth cause "that for the sake of which" and good as connected (τὸ οὐδ' ἔνεκα καὶ τὰγαθόν)⁵. In the second chapter of the B book Aristotle also makes an allusion to the poet, who was carried away into making an absurd statement when he said "he has the end for the sake of which he was born"⁶. For not every stage that is last claims to be an end, but only that which is best (τὸ βέλτιστον), which death is surely not.

A science of nature must take account of each of four causes and refer to them all in its explanation of events. But obviously there are some cases which deny the existence of a final cause in nature or any other cause. Aristotle tries to establish the existence of such a thing by pointing out that we also have events, which form exceptions to the habitual rule of nature. The same events are characterised as happening "neither always nor for the most part" and therefore κατὰ συμβεβηκός, per accidens, accidentally⁷.

That is the way in which Aristotle brings these two categories into ontology, for they can be grasped as modalities of being. Chance and spontaneity are defined as accidental causes (αἰτία κατὰ συμβεβηκός)⁸. Of course they cannot be found in the field of *prima philosophia*, but nevertheless we can take them as equivalent to the notion of accident (συμβεβηκός). Both belong to the mode of causation, for either some natural or some intelligent agent is always the cause; but in this sort of causation the number of possible causes is infinite. Spontaneity and chance are causes of effects, which though they might result from intelligence or nature, have in fact been caused by something accidentally. Now since nothing which is accidental is

prior to what is per se (καθ' αὐτό)⁹, it is clear that no accidental cause can be prior to a cause per se. Spontaneity and chance, therefore, are posterior to intelligence (νοῦς) and nature (φύσις). We don't know clearly how the notion of intelligence is to be apprehended — it can be human mind, close to διάνοια, but also godlike in the Anaxagora's view, as presented in the *Metaphysics*:

When one man¹⁰ said, then, that reason (νοῦς) was present-as in animals, so throughout nature-as the cause of order (κόσμος) and of all arrangement (τῆς τάξεως πάσης), he seemed like a sober man in contrast with the random talk of his predecessors. We know that Anaxagoras certainly adopted these views, but Hermodotus of Clazomenae is credited with expressing them earlier.

Unexpectedly we find only one passage in the *Physics* mentioning intelligence (νοῦς)¹². M.J.Buckley in his book decided to understand it as the human mind and identify it with the term τέχνη, i.e. art. Namely Aristotle in the Lambda book of the *Metaphysics* distinguished four ways of coming into being — either by art, or by nature, or by chance or by spontaneity¹³. Whereas art is a principle of movement in something other than the thing moved, nature is a principle in the thing itself, and the other causes are privations of these two. Chance and spontaneity are causes of results such as might originate from mind or nature as cause, though in fact they are brought about by some accidental cause¹⁴. Spontaneity will always involve external causes (and in this, it is like art), but these external causes will always be the result of motions which have nature as a cause. Spontaneity is, therefore, posterior to nature and dependent on it. So everything that is by nature in an individual is also to some degree spontaneous. Correspondingly, that which could have been projected through antecedent planning or deliberation but was not, is said to happen by chance. So we have four principles:

- 1) nature, when the principle is internal;
- 2) art, when the principle is external and in an intelligent agent;
- 3) spontaneity, the privation of an internal principle in an event which might have possessed it;
- 4) chance, the privation of an artistic plan in a movement which could have been effected by it.

Nature and spontaneity don't engage the use of reason, while art

and chance do involve the use of reason or its privation. Furthermore nature and art agree in being essential causes of events and processes or movement (because for Aristotle nature is the principle of motion itself), while spontaneity and chance agree in being accidental causes.

The above correspondence can be presented in this scheme:

Essential cause	Accidental cause
φύσις	αὐτόματον
(internality of cause and its negation)	(externality of cause and its negation)
τέχνη	τύχη
(externality of cause and its negation)	

Let us look at Aristotle's definitions of both terms. Aristotle says: "Chance is an accidental cause in the sphere of those actions for the sake of something which involve purpose." (αἰτία κατὰ συμβεβηκός ἐν τοῖς κατὰ προαίρεσιν τῶν ἔνεκά του¹⁵). We can also find an almost identical formulation in the *Metaphysics*¹⁶.

Perhaps the most important here is that the notion of συμβεβηκός is used in a much wider meaning. The accidental is not only something ontological, attached to one thing and not being in its essence, but also refers to events, which would be better described as chance-events. In the Delta book of the *Metaphysics* we find the following description and example of something happening accidentally (κατὰ συμβεβηκός, per accidents):

*"Accident" means that which attaches to something and can be truly asserted, but neither of necessity nor usually, e.g. if some one in digging a hole for a plant has found treasure. This — the finding of treasure — is for the man who dug the hole an accident; for neither does the one come of necessity from the other or after the other, nor, if a man plants, does he usually find treasure.*¹⁷

The first common characteristic of chance (τύχη) and accident forms a criterion, also repeated in *Physics*: none of them is (1) neither of necessity (ἐξ ἀνάγκης) nor (2) for the most part (ἐπὶ τὸ πολὺ)¹⁸, but they are also described as things that are not always coming to pass in the same way (τὰ ἀεὶ ὡσαύτως γιγνόμενα)¹⁹. The chance will therefore not be the accidental cause, if undergoes one of these three conditions. This being the case — what is then the real difference between chance and accident? Are they identical or not?

H. Weiss claims that the accidental has the character of a universal-ontological concept — it is one of the variations of τὸ ὄν λέγεται πολλαχῶς²⁰. But the ontological level is nevertheless primary in regard to the phenomenological, i.e. the level of (natural) phenomena, so we can conclude that everything happening ἀπὸ τύχης is συμβεβηκός as well. This is not to be true inversely: there exists no such thing, which could be named as συμβεβηκός ἀπὸ τύχης²¹.

Let us pass on to the next passage from the definition (*Phys.* 197a 5-6). The second notion defining chance is προαίρεσις. We can translate this word as *choice* or *intention*. Intention or προαίρεσις must be assigned only to human beings, for no inanimate things (ἄψυχα), or animals or children are capable of doing anything by chance. The formulation of chance as "action involving intention" can be attributed only to human beings and "choice" is now that distinctive feature, which distinguishes chance from spontaneity.

Besides purpose, Aristotle demands another characteristic of chance. Good fortune (εὐτυχία) is mainly connected to moral action:

*Therefore necessarily chance is in the sphere of moral actions (τὰ πρακτά).*²²

Purpose is for the most part not enough for bringing chance, and so it must be realised through action (πράξις), which is usually good and moral. Such sphere of activity is once again proper only to human beings — an inanimate thing or an animal or a child are incapable of deliberate intention resulting in moral actions. Their activity always belongs to spontaneity (in this passage Aristotle is very strictly accentuating the differentiation of both terms).

And finally, the third criterion after (1) accidental nature, and (2) belonging to actions with purpose, for a definition of chance is appurtenance to the field of ἔνεκά του, to the things which are made "for the sake of something". Aristotle is evidently trying to find the purpose or the end of action, defined as chance. The idea can be illustrated with an earlier example from the *Metaphysics* of accident: if someone is digging a hole (this is the moving cause, *causa efficiens*), we have obviously a kind of action involving intention (προαίρεσις) — in the case above he is trying to dig a plant with the purpose of using its

fruits, and so on. But then he finds some treasure. The action of digging was undoubtedly carried out with a strictly definite purpose, yet not with that one, which is at the end recognized as the right one, but accidental. The finding of a treasure is an unintentional *causa finalis*, taking the place of the first, primary end of action and substituting it. When a man digging a hole finds hidden treasure, he will immediately identify the latter as the real purpose of his action and "exchange" it for the first one. This second, unintentionally received but wished-for purpose is (a) undesigned and unintentional and (b) more longed-for and significant than the first purpose.

III.

Unfortunately the example above causes some problems. The first one is that it is the only example of chance, describing τύχη as exchange of two final causes²³. None of the examples in the *Physics* can be assigned as such. The second one is the following — what can be said about the status of spontaneity (αὐτόματον)? How is it connected with the final cause and who is its subject?

On the whole we cannot find any definition. H. Weiss in her book suggests the following reconstructed variation: "Spontaneity is an accidental cause in the sphere of actions in nature which are for the sake of something (αἰτία κατὰ συμβεβηκός ἐν τοῖς κατὰ φύσιν τῶν ἔνεκά του)"²⁴.

The distinction between the two concepts that H. Weiss is proposing coincides with that of Buckley: now we have the region of intention (προαίρεσις), and the region of nature (φύσις) which are the dividing-line between intentional chance and natural spontaneity. This division is nevertheless only a repetition of Buckley's separation between τέχνη and φύσις, although it provides a better solution, affirming the purpose-directedness of both (which Aristotle seems to be permanently stressing in the fourth and the fifth chapter, e.g. 196b 19, 29-30, 33). The difficulty of this reconstructed version is more in its universal validity than in its correctness. The stated paralelism between spontaneity and purposeness surely doesn't explain all Aristotle's cases of spontaneity in the *Physics*, so it cannot be generalized to all of them. Aristotle still undoubtedly believes that both intellect (διάνοια) and nature (φύσις) belong to the

purposely acting agents (of course the hypothesis about the teleology of nature is hidden in this consideration)²⁵.

But nevertheless, I propose the following "diairetic" scheme for understanding both terms (Phys. 196b 17-33):

	Τύχη	
with intention		(ΚΑΤΑ ΠΡΟΑΙΡΕΣΙΝ)
by intellect		(ΑΠΟ ΔΙΑΝΟΙΑΣ)
without intention		(ΟΥ ΚΑΤΑ ΠΡΟΙΡΕΣΙΝ)
for the sake of something		(ΗΕΝΕΚΑ ΤΟΥ)
by nature		(ΑΠΟ ΠΗΨΣΕΟΣ)
by accident		(ΚΑΤΑ ΣΥΜΒΕΒΕΚΟΣ)
	Αὐτόματον	(ΤΑ ΓΙΓΝΟΜΕΝΑ)
not for the sake of something		(ΟΥΗ ΗΕΝΕΚΑ ΤΟΥ)
by itself		(ΚΑΘ'ΑΥΤΟ)

We have illustrated that chance is (1) produced accidentally (κατὰ συμβεβηκός) and is also (2) purpose-serving (ἔνεκά του). When it is designed by human reasoning and involves intention, then it is called chance (τύχη), but when it is the effect of purposefulness of nature we call it spontaneity (αὐτόματον). However, in the sixth chapter of the second book, Aristotle introduces a different conception of the latter. It seems as though he was sparing his time to say something about it all along. Surprisingly enough, he says that "*spontaneity* is the wider term. Every result of chance is from what is spontaneous, but not everything that is from what is spontaneous is from chance".²⁶

How should the above statement be understood? So far we have shown two models of separation between τύχη and αὐτόματον, both with undeniable support in the text.

We have treated two different, separated kinds of phenomena, but now Aristotle is claiming that αὐτόματον is the more general term and includes it as a special class. Is Aristotle forgetting his own explanation for a moment and classifying a man within the nature?

Let us look at the content of this chapter. At the beginning we find a fine, but doubtful illustration of the spontaneous; that is, in Aristotle's opinion, found in the lower animals and in many inanimate objects:

We say, for example, that the horse came "spontaneously", because, though his coming saved him, he did not come for the sake of safety. (Phys. 197b 16).

This example is cited by W. Wieland in his classical work on Aristotle's physics²⁷, and this is not a coincidence. Namely the illustration with the horse is the only one describing spontaneity as an event with the accidental cause as purposeful. From this time on all the other illustrations are different — they will not involve purpose.

In Wieland's opinion (and I believe his interpretation can be taken as paradigmatic for elucidating the ambiguity of Aristotle's text) the horse returned home (perhaps from a battle) because of a stable-instinct (Stalltrieb), saving its life. However — the circumstances are not so important here. The most cogent, but nevertheless dubious contribution in his explanation is the thesis about the so-called Als-ob-Teleologie. If Aristotle's theory of nature presupposes teleology as its universal principle, than we shouldn't be able to find any chance events in it. How are chances in nature possible at all? Wieland's idea is that teleology is not an universal-cosmic or metaphysical principle, but a reflective concept (Reflexionsbegriff)²⁸. Astonishingly a few pages afterwards he seems to be unhindered in saying that "chance and necessity in Aristotle are not against teleology, but because of it".²⁹

Let us look at what is so controversial in his conception of Als-ob-Teleologie. If we use his thesis to explain the case of the horse, everything appears to be consistent: the horse behaves in a way which could be described as purposeful; its instinct is here an alibi for the presence of purpose in it. It is worth mentioning that Ross and Cornford used to describe these situations as "the unconscious simulation of purpose in nature" — it looks as though some events and processes in nature are occurring unconsciously.

But the next case, immediately following in the passage, fails to prove this thesis:

*Again, the tripod fell "of itself", because, though when it fell it stood on its feet so as to serve for a seat, it did not fall for the sake of that.*³⁰

As far as I understand Aristotle's intention the tripod stood on its feet before falling. After the fall it does not stand on them, so there is no purpose in this event, because it cannot be used as a seat. The Greek text seem to be quite clear and Aristotle is picking this well-known etymology of *automaton* to indicate the lack of purpose. It comes from

μάτην, meaning *for nothing* or *to no purpose* (Phys. 197b 23), but it contains, as Cornford remarked, this ambiguity: something can be μάτην if includes either the failure of purpose or the absence of purpose³¹. Wieland, according to his theory, is trying to repeat this example in the following manner: "the tripod fell in a way that a man can sit upon it. But it didn't fall for the sake of sitting, it just happened by itself. So it seems as though (als ob) it fell because of such purpose"³².

So he is desperately hoping to see some purpose in this obviously purposeless event, in order to defend his Als-ob-Teleologie thesis. Moreover, he intends to use a completely identical explanation for the next case:

*The stone that struck the man did not fall for the purpose of striking him; therefore it fell spontaneously, because it might have fallen by the action of an agent and for the purpose of striking.*³³

In the second part of the case, the possibility of the action of an agent and his purpose is denied³⁴. Therefore the stone must have been fallen "to no purpose" and not thrown by some person. Evidently it fell off a roof or a mountain. Wieland again reconstructs this example in his own way, saying:

*The stone falls spontaneously and kills someone; although it didn't fall with the purpose of hitting someone, we can imagine that it was thrown by a man with this purpose. In that case we say: it fell as though (als ob) it had the purpose to hit the man.*³⁵

Wieland is postulating the situation that is excluded by Aristotle as fictitious. In Aristotle's version, both man and (his) purpose are eliminated, but Wieland must keep both of them in order to save his reading of this passage. It would remain totally obscure what the purpose in this case is supposed to be unless we assume that nature somehow wanted the man to be struck by the stone, which is absurd. So he must imagine an actual person throwing the stone in reality, and that is exactly the case Aristotle describes as a conceived, unreal analogy³⁶.

This Kantian view, describing the above situation in terms of appearance (Schein), seems to be highly controversial — it cannot be carried out without presupposing a human being.

In order to see things as though (als ob) they are purposive we must

place a person, who is seeing the whole event as such, i.e. it is not unwinding, but just for his gaze.

This totally subjective explanation is obviously not in accordance with Aristotle, who accentuates the spontaneity of nature — therefore nature is the subject here, and Aristotle simply tries to show that no purpose is involved in the accident of striking a man. Besides this, no reasonable argument is given for demonstrating this example as causally explainable, although Aristotle treats both *tyche* and *automaton* as special causes³⁷.

It is interesting that D. Ross in his standard piece on Aristotle also projects teleology into the concept of spontaneity. After asserting that not all accidental events are chance events (for the latter must be, in addition, "for the sake of something"), he draws a distinction between (a) the purposive action of human agents (τύχη) or (b) the unconscious striving of nature (αὐτόματον)³⁸. In his opinion in both cases a desirable result is produced that might *naturally*³⁹ be an end. Again spontaneity seems to be more problematic; namely even if the case with the rescued horse is depicted as an example of a spontaneous purposive act (in Ross's interpretation the cause of the horse's going in the direction of home is something external to it, because it was made without deliberate choice), we can find more cases with evidently no end involved. The best example Aristotle gives us is the cases of the production of monstrous births (τὰ τέρατα), which are "by nature" and still not desirable. They present a kind of deviation in nature, but nevertheless are such failures (ἁμαρτίαι) caused within it, i.e. their cause is internal⁴⁰. Monstrosities are failures of purpose in nature just as in the arts, when writers make mistakes, or physicians administer the wrong dose. It is worth mentioning that the present example does not try to depict the spontaneity of nature — it is not an example of it; in Aristotle's view everything, which happens in nature, is purposive, and exceptions are only affirming the rule.

In our opinion the B book of the *Physics* doesn't provide enough arguments for the general statement that the purposiveness of nature is the general characteristic for depicting spontaneity. The above mentioned example with the horse is obviously affirming our view — the

phenomenon of spontaneity cannot exclusively be described as a natural event with purpose. It is rather an example of a chance event without purpose, which still remains a chance event. Being purposeful seems not to be a very good criterion for describing something as chance or spontaneity (or even for differentiating between them). More likely that it is intention (προαίρεσις), which appears to be significant of both τυχη and αυτοματων, and all cases Aristotle gives us can be explained as such. So our suggestion would be to reconsider the apparently undoubtful hypothesis of the teleological "behaviour" of nature (given by some interpreters and partly also by Aristotle) and reread it on the basis of the distinction between intention (προαίρεσις) and purpose (τέλος).

1 Cf. Met. 982b 9, 983a 5, 996a 20.

2 Met. 1026a 18.

3 Empedocles, for example, states there is no final causes in nature — all apparent moving to ends in nature must be simply understand as the result of natural selection.

4 Phys. 194a 30.

5 Met. 983a 34.

6 Phys. 194a 33.

7 I prefer the translation *accidentally* rather than *incidentally*, although I know that something συμβεβηκός is a concomitant and not accidental at all.

8 Phys. 197a 34.

9 Phys. 198a 10.

10 Anaxagora.

11 Met. 984b 15-19.

12 Phys. 198a 10.

13 Met. 1070a 5.

14 Cf. Phys. 198a 5-7.

15 Phys. 197a 5-6.

16 Met. 1065a 29-30.

17 Met. 1025a 14-19.

18 cf. Met. 1025a18, Phys. 196b 13.

19 Phys. 196b 10.

20 Helene Weiss: Kausalität und Zufall in der Philosophie des Aristoteles, Wissenschaftliche Buchgesellschaft, Darmstadt 1967, p. 165-180.

21 Weiss, p. 163.

22 Ανάγκη περί τὰ πρακτὰ εἶναι τὴν τύχην, Πηυσ. 197b 3.

23 And this can be questioned too. Namely can we really speak of changing one