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Kata symbebēkos in Aristotle's Teaching on Deformity in *GA**

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ABSTRACT. In *Physics*, book II, Aristotle says that besides the four well-known causes there is a fifth, chance (*tychē*) or accidental (*automaton*) one, which is no less important. Despite the fact that Aristotle does argue about spontaneous generation and deformities in his biological works, the relationship between the *accidental* and the four main causes (especially the formal one) is less than clear in his teaching on embryology. The relationship between the *accidental* and its counterpart is usually characterized in *modal* terms. Likewise, in the general discourse of Aristotle's teleology the accidental is contrasted with a *necessity*; the former is a diverted implementation of something that was supposed to be a necessary step for the sake of an end. This diversion is something that is not required, but which nevertheless happens. However, the statement conveyed in *The Generation of Animals*, book IV, that monstrosities are "per accident necessary" overturns this common characterization and suggests that it could be otherwise. This study offers some insights into the problem regarding the necessity of irregular generation and ensuing deviations in Aristotelian philosophy and biology. It questions the standard interpretation of the relation between incidental occurrences and teleology and suggests a way of reconciling the two. The study of the problem of the accidental in embryogenesis leads us to the problem regarding the normativity of human nature. This allows us to broaden the picture of embryology in antiquity for the purposes of understanding human nature in the context of causes and teleology.

KEYWORDS: Aristotle, embryology, form, necessity, accidental cause, deviation.

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Introduction

The focus of the paper is the problem of the “accidental/incidental”¹ in Aristotle’s theory of *generation*. Despite this seemingly narrow goal, it is a part of a bigger pursuit, which aims to demonstrate Aristotle’s acceptance of incidental instances which do not occur because of the direct and primary teleology.² In *Metaphysics*, Aristotle says:

it is clear that there is no science of the accidental — because all scientific knowledge is of that which is *always* or *usually* so.³

The further claim about a dubious status of accidentals in *Metaphysics* reads that “the accidental is obviously akin to non-being...”⁴ In this paper, I will argue that the analysis of the role the accidental cause plays in Aristotle’s theory of generation makes us think that there might be room for the *science*⁵ of the accidental within Aristotelian philosophy.

Understanding the accidental hinges on understanding its relationships to its counterpart, the *essential*, which is usually defined in *modal* terms. The essential is something inevitable, something that is necessary, that has to be or has to happen, while the accidental is something that is not necessary. Likewise, in the general discourse of Aristotle’s teleology, the accidental contrasts with *necessity*. An accidental is a diverted implementation of something that was supposed to be a necessary step for the sake of an end. However, there is a famous place in *The Generation of Animals*, book iv, where Aristotle talks about deviation and monstrosities as “*per accidens* necessary”.⁶ In a very broad sense,

¹ In this text, I will use the words *incidental* and *accidental* interchangeably. For the purposes of this study, it remains to be determined if there is any relevant difference between them.

² There is ample literature on the problem of accidental cause in Aristotle’s thought. See first of all: Preus 1975; Sorabji 1980; Heinaman 1985; Balme 1987; Charles 1988; Cooper 1987; Kupreeva 2010; Dudley 2012.

³ *Metaph.* 1027a20. All translations from *Metaphysics* are by W.D. Ross.

⁴ *Ibid.* 1026b–23.

⁵ The word *science* here does not bear the semantic use we usually attribute to it.

⁶ GA 767b13–15: “As for monsters, they are not necessary, so far as the purposive of final cause is concerned, yet *per accidens* they are necessary (κατὰ συμβεβηκός

monstrosity for Aristotle is when “nature deviates from the generic type.”⁷ In *Physics*, he speaks about physical deviations as of failures “of the purposive effort”,⁸ this makes problematic their definition as *something necessary* when we see it in GA iv. This, I believe, questions the common characterization of the relationship between accidental and necessary and advises that it can be otherwise. Understanding of this type of incidental is invaluable. Besides the desire to disentangle another inner problem of the overly convoluted account of Aristotle's teleology, this study aspires to define the state of natural deviation in the generation of humankind.

The analysis of Aristotle's teleology aims to demonstrate that there are at least three types of necessity: simple (ἀπλῶς), conditional or hypothetical, (ἐξ ὑποθέσεως) and forced necessity (βίαιον). Consequently, in different cases we deal with different types of necessity. I will show that the application of the predicate “accidental” is multidimensional in Aristotle's logic, i.e. there are numerous types of accidental for Aristotle and different types of necessity. This seems to be crucial, because some types of necessity are reconcilable with teleology and some are not. In order to locate the role of this specific type of irregularity (accidental), I will need to study: 1) Aristotle's account of teleology and necessity in biology, physics, and metaphysics; 2) his account of *essential* and *accidental* attributes in logic (especially in *The Posterior Analytics*) and its application to biology; 3) the evaluation of the concept of Form (formal cause) as a *normative* one will give additional room to fit *incidentals* in the general picture of Aristotle's teleology.

The Problem of Accidental in Embryology

The opening argument carries a disclaimer about Aristotle's definition of natural processes as bearing no relation to the complete resolution of the tension between necessity and accidental. In *Metaphysics* 6.2,

ἀναγκαῖον), since we must take it that their origin at any rate is located here.” All translation from GA are by A.L. Peck.

⁷ GA 767b8–9: παρεκβέβηκε γὰρ ἡ φύσις ἐν τούτοις ἐκ τοῦ γένους τρόπον τινά.

⁸ Ph. 199b4–6.

Aristotle claims that the very existence of accidentals is determined by the definition of the natural things which *are* (exist) for the most part. In that book, Aristotle advocates some sort of ontological dualism where things are divided into those 1) which *are* always necessarily (invariables) and those 2) which *are* for the most part.⁹ The existence of something which is neither invariable nor of necessity, i.e. things that *are* not always but “for the most part” is the source and the reason for the very existence of the accident (τοῦ εἶναι τὸ συμβεβηκός).¹⁰ Something that is neither always nor for the most part is called incidental. Thus, any kind of physical deficiency due to an incident in the course of embryological development can be defined as a privation of a normal development. This seems to be an inalienable principle of the natural process, which *is* for the most part. The very existence of deficiencies (incidentals) is possible because a natural process has a potential for change to the opposite state. This aligns with the claim that “monstrosity, of course, belongs to the class of things contrary to nature, although it is not contrary to nature in her entirety but only to nature in the generality of cases.”¹¹ But this explanation of accidental through privation is insufficient because it does not account for the whole diversity of incidentals for Aristotle.

In order to put it into context, we need to see what kinds of accidentals (deviations) Aristotle mentions in *GA*, book iv. If we look at a list of all possible deviations in the course of gestation Aristotle offers, we can see that some of them will immediately raise questions about their interference with a necessary process which is carried out for the sake of an end. Aristotle’s account of deformity comes right after his consideration of heredity. His very general understanding of deformity does include as a first step a broad conception of diverting from the standard process of inheritance. Normally, children resemble parents; if it does not happen, then some deformity enters the picture.

Some [offspring] take after none of their kindred, although they take

⁹ *Metaph.* 1026b27.

¹⁰ *Ibid.* 1026b27–31.

¹¹ *GA* 4, 770b9–10.

after some human being at any rate; others do not take after a human being at all in their appearance, but have gone so far that they resemble a monstrosity, and for the matter of that, anyone who does not take after his parents is really in a way a monstrosity, since in these cases Nature has in a way strayed (παρεκβέβηκε) from the generic type. The first begining of this deviation is when a female is formed instead of a male¹²

For indicating diversion from the standard development, Aristotle here uses the verb παρεκβαίνω. As a matter of fact, throughout GA iv Aristotle uses different derivatives of this verb and also different variations of the verb ἐξίστημι.¹³ The semantics of these verbs overlap and different meanings of them vary significantly. For instance, ἐξίστημι can mean both *to deviate*, and also *to depart from the type, to degenerate*. A.L. Peck in his translation of GA renders ἐξίστημι as *altering the character*, which does not seem to do justice to Aristotle's account. Conceivably, Aristotle talks about deviation, both in some technical sense and in some normative sense, where the former is just a step away from the "smoothness" of generation and the latter involves real instances of deformity ultimately resulting in a transgression of the species form. Thus, παρεκβαίνω and ἐξίστημι can indicate either some rather paltry difference in the phenotype, which would mean a deviation in a rather technical sense, or some significant deviation. The comprehensive list of deviations outlined by Aristotle in GA iv includes:

- a) Different genders.
- b) Variety in phenotype (different eye color and the like).
- c) Incidentals, which bear some positive or neutral effect. Like the presence of some residues in the body or development of some characteristics which are necessarily attributed to a particular species, e.g. a tail-bone in the case of human kind.
- d) Instances of some serious deviation bearing rather negative effects on the species, while the ability to attribute the species is clearly preserved.
- e) Complete monstrosity (only "animality" is preserved).

¹² GA 767b6–9.

¹³ For example, cf. GA 768a2, 15; 768b8.

Clearly, when Aristotle talks about a female offspring, to take the meaning of ἐξίστημι as deviation, in the sense of deformity and unnatural generation, is too much of an exaggeration and lacks sensitivity to the polysemantics of the vocabulary, which is definitely present in Aristotle's writing. Accordingly, the gradual steps from an ideal instance of generation¹⁴ toward real deformity (through "deformity" in a merely technical sense) would appear as follows:

1. 766b15–16: the offspring is not male.
2. 768a35: the offspring is not resembling the father.
3. 768a28–768b10: the offspring is not resembling the parents but grandparents or some further ancestors.
4. 768b10–13: the offspring is just like other humans.
5. 767b5–7: the offspring is not like other humans;
 - a) serious deviation but humanity is preserved;
 - b) complete monstrosity and failure of generation.¹⁵

Clearly, the relationship of all the mentioned classes of incidentals with essentialism and teleology cannot be the same. In order to avoid the generalization, we need to analyze their relationship with essential attributes and necessities. Before I engage in a discussion about the relationship between the accidental and its counterpart (the essential/necessary), it seems crucial to note that there are several types of necessity for Aristotle. The most frequent interpretation of this part of Aristotle's philosophy advises that there are three standard senses of the term *necessity*.¹⁶ They are as follows.

1) Absolute or simple necessity (τὸ δ' ἀπλῶς ἀναγκαῖον) (AN). This is a type of necessity which relates to the things and events that cannot be otherwise. Aristotle primarily attributes it to eternal things: celestial

¹⁴ Which is in fact only ideal; a limited existence of this type would make the continuation of the species impossible for obvious reasons.

¹⁵ Aristotle's depiction of this listing is explicit, therefore it can be found elsewhere in the literature. See, for example, Connell 2016: 342.

¹⁶ Even though scholars might disagree about the names of these different types of necessity, they all agree that there are three of them. Cf. Preus 1975: 185; Connell 2016: 328–329; Dudley 2012: 102. Dudley suggests that this part of Aristotle's teaching was inspired by different Plato's texts.

bodies, mathematical objects, etc.¹⁷ A certain type of absolute necessity can be attributed to the generation of living beings. The cyclical process of reproduction as eternal alteration of generation and decay resulting in the continuous transmission of the form warrants the sublunary striving for eternity and can be seen as *simply* necessary. 2) Conditional or hypothetical necessity (τὰ δ' ἐξ ὑποθέσεως) (HN). It is a relative necessity of means needed for the sake of some goal, which applies to the process of becoming, playing a significant role in Aristotle's teaching on embryology and generation.¹⁸ Every step of the development of the embryo is hypothetically necessary; it exemplifies an essential condition for the sake of further development and the fulfilment of generation which results in the perfection of the *form* as a definition of a living and functioning individual. 3) The third type of necessity is a forced necessity (τὸ βίαιον) (FN). Under this heading Aristotle talks about different types of things; for example, in the case of human behavior it is a necessity which is opposite to choice. This type of necessity turns a voluntarily act into an involuntary one, according to the definition given in *EN* III. Likewise, in inanimate nature a stone falls owing to gravity, but can be thrown up by force. In the case of generation, "force necessity" refers either to some external force which influences or alters gestation; or it refers to some elemental powers within the development which stem from the nature of the material only and not relative to the result of embryological development.¹⁹ For Aristotle, instances of forced necessity usually have some external source of change²⁰ but they can also result from some inner process, like irregularity of matter or weakness of the efficient principle.

The most general explanation of a possible consistency between necessity and something accidental can be inferred from Aristotle's understanding of natural beings. In *Metaphysics* VI.2, Aristotle argues that

¹⁷ *Ph.* 199b24–200a5; *Metaph.* 1015a24; *PA* 639b23–4; *GA* 778b1; *GC* 337b35.

¹⁸ *Ph.* 199b24–200a5; *PA* 642a13, 639b25–31; *GA* 776b31–33.

¹⁹ Sophia Connell in her most recent book has thought hard about the importance of this type of necessity for Aristotle's account of generation. She even suggests that it should be called "material necessity". See Connell 2016: 328–340.

²⁰ *EN* 1110a1b–17.

beings are either: 1) always necessary but not forced; 2) always for the most part; 3) something accidental.²¹ I suggest discussing the match between these three types of beings *and* three types of necessity: a) simple; b) conditional or hypothetical; and c) forced necessity. For the purposes of this paper, we can leave aside the match between simple necessity and beings which are necessary (but not forced). The conditional necessity dictates that the conjunction of the function (in the sense of the functional being) with all preceding steps should necessarily take place for the sake of that function. The accidental in this ontological scheme is not always a being but is also an event or an attribute of the natural being. It can literally be anything, e.g. an elephant stepping on a tomato plant, which indicates an accidental termination of tomato's growth; or having blue eyes in human beings which serves no purpose. An example of accidental non-being in the field of generation would be a fetation which went completely wrong (a miscarriage due to inability to develop further). This would not be an entity for Aristotle, but rather a bulk of matter, which neither has a form in the proper sense of this concept, nor can be associated with any recognizable function.

I believe it is pivotal to analyze the relationship between accidentals which: a) seem to match with forced necessity and b) with conditional necessity as well. I put forward a hypothesis that even though cases of forced necessity in generation are seemingly out of purposive processes, some types of incidentals which result from forced necessity are not at odds with conditional necessity. Rather, they are part of a teleological account. The reason I argue this is because, with regard to generation, we might have individuals which are clearly bearers of some deviations but are capable of species functioning. In order to see how this type of incidental which is caused by forced necessity can at the same time be reconciled with conditional necessity, I suggest to look into the explanation of different types of incidentals in Aristotle's logical works.²² For the analysis of the use of *κατὰ συμβεβηκός* in *The Posterior Analytics*, we need to look at two tricky passages from this work (1.4

²¹ *Metaph.* 1026a34–36.

²² The problem of accidental properties in logical works of Aristotle had been a

and 1.22). Aristotle talks here about the distinction between accidental and essential predicates. The difficulty of Aristotle's logical account of essentialism lies in the variety of classes of essential and accidental predicates, where the distinction between the two is not so clear-cut.

Aristotle's essentialism requires one important observation to be made when reading *APo.* 1.4. There are two meanings of *in itself* (essential attribute). The first one: "It is *in itself* (1) as far as it belongs to it *in what it is*."²³ This is straightforward, for instance something self-predicating: a nose is a nose. "*In itself* (2) is something what belongs to something else and what is a part of that other, what makes clear what it is."²⁴ The best example of this type would be the snubness of a snub-nose. According to this passage, something is accidental only if it does not qualify to be either *in itself-1* or *in itself-2*.

When we turn to *APo.* 1.22, things become tricky since in that chapter Aristotle makes another distinction between the essential and accidental predicates which seems to be at odds with the one from 1.4. As I can see it, in 1.22 Aristotle defines essential only as that which is predicated of something in *what it is*, while other predicates are incidentals.

We have supposed that one thing is predicated of one thing and that things which are not what something is (ὅσα μὴ τί ἐστι) are not predicated of themselves. For these [i.e. things which are not what something is] are all incidentals (συμβεβηκότα γάρ ἐστι πάντα) though some in themselves and some in another fashion (ἀλλὰ τὰ μὲν καθ' αὐτά, τὰ δὲ καθ' ἕτερον τρόπον) and we say that all of them are predicated of some underlying subject, and what is incidental is not an underlying subject.²⁵

Aristotle seems to be redrawing the lines here and singles out two variations of the meaning when something is accidental: 1) as accidental in themselves (ἀλλὰ τὰ μὲν καθ' αὐτά) and 2) in some other fashion

subject of scrutiny in several papers. The most important are Tierney 2001 and Zuppolini 2018.

²³ *APo.* 73a35–39: Καθ' αὐτά δ' ὅσα ὑπάρχει τε ἐν τῷ τί ἐστιν. All translations from the *Posterior Analytics* are by Jonathan Barnes with my amendments.

²⁴ *Ibid.*

²⁵ *Ibid.* 83b17–22.

(τὰ δὲ καθ' ἑτερον τρόπον).²⁶ Obviously, it offers a different chart of the relationship between the *in itself* and the incidental. I think that if we put these two accounts together, we can see a certain overlap. Incidentals outlined in 1.22 differ only from *in itself-1* outlined in 1.4, but most importantly, the revised version of incidentals outlined in 1.22 includes *in itself-2* from 1.4, these incidentals are *per se* incidentals which at the same time are not predicated of it in *what it is*.

I argue that this overlap between *in-itself-2* and *something accidental in themselves* might be of perfect use in accounting for the types of incidents in embryological deviations. If we apply the meaning of *in itself* incidental to generation, we can easily find good and illuminating examples. For instance, the development of a tailbone in the course of embryogenesis of human beings is a necessary thing, which is not for the sake of something else. Therefore, it should be considered as a result of forced necessity only. However, its affiliation with forced necessity is problematic because it belongs to its essence. This is a characteristic which belongs to the essence of the species but has no discernible function, i.e. it is not a part of the definition of the species, which determines *what it is* in the sense of the formal cause.

If we apply this scheme from Aristotle's logical works to the analysis of his biological writings (and some books of *Physics* and *Metaphysics*), it will help to pick up on this taxonomy of *incidental* predications. I seek to back up the hypothesis about the relationship of different incidentals and different necessities, which I tentatively can represent in this chart.

1. Attributes	Essential		Accidental	
	In itself-1 = In what it is	In itself-2 = Accidentals in themselves	Accidentals in some other way	
	a		b	c
2. Types of necessity	Conditional		Conditional / Forced	Forced

In order to read this chart, we need to put one layer on top of another. If we do that, we will have three following types of incidentals:

²⁶ APo. 83b19.

- a) essential incidentals which correlate with conditional necessity only.
- b) separable (not essential) incidentals caused by forced necessity which at the same time are reconcilable with conditional necessity.
- c) separable incidentals conditioned by forced necessity which are irreconcilable with conditional necessity.

We need to focus on type (b). In the second part of the paper, I will offer two arguments for the plausibility of the interpretation that these incidentals are determined by both forced and conditional necessity.

Accidental Necessity and Form

There is a peculiar type of incidental instance in embryological development which is not a part of its essence, thus it is not seemingly a part of its purposive effect. These are caused by some type of forced necessity but at the same time some of them, as I argue, can be reconciled with the general course of the teleology of generation.²⁷

The results of non-telic, accidental impulses in the process of generation can be either: a) beneficial (sic!); b) neutral; c) detrimental. If we look at the relation of these phenomena with the formal cause, we can see that none of them can be a direct part of teleological explanation. The beneficial effects include some types of residue which develop merely due to the nature of elements and are beneficial for the functioning of the body. The neutral type of incidental produces variation in parts which warrants the diversity of the phenotype among the representatives of the same species. This diversion is something minor and affects just some auxiliary physical attributes like skin color, hair color, facial traits, freckles or lack thereof, tallness, obesity, slackness, snubness, and the like. The last type of accidentals is a source of a more *serious* variation. They generally bear some detrimental effect and are marked as substantial deviations. It is something that is less than a completely formless monstrosity but is more deviant than just a different phenotype. This type of deviation is the trickiest and I aim

²⁷ Some ideas and arguments in this part of the paper were inspired by reading the paper published by Anthony Preus. See Preus 1979.

to prove that it can still be reconciled with teleology. For the purposes of proving the last point, I will need to develop my argument in two steps:

- 1) We need to operate with the understanding of formal cause as a *normative* concept.
- 2) We need to tackle Aristotle's distinctions between two different types of conditional necessity.

Some incidental occurrences in the course of gestation cause accidental characteristics leading to palpable deviations resulting in the attribution of a disability, such as blindness, deafness, lack of limbs, lack of inner parts of the body, mental deviations, and other disorders. Despite the seriousness these deviations indicate, Aristotle would consider individuals who possess these deviations as representatives of their species. Therefore, these incidental deviations can be reconciled with the overarching purposive effort of a particular instance of generation. The explanation which can be given to this inconsistency requires acknowledging that the fulfillment of the purposive effort admits a degree of perfection. The *form*, formal cause, defines perfection (final cause) in the arrangement of the matter (material cause) in any particular entity for Aristotle. Form corresponds to perfection, and if perfection admits a variety of degrees, then the concept of form (formal cause) must concede degrees of normativity.

If we assume that the *form* has normativity, does it mean that there is a hypothetical excellence of the εἶδος, diversions from which appear as a regressive scale of failures? I believe that the aforementioned failures can be considered on a regressive scale but they are digressions from some ideal. To illustrate this point, we can ask the question, what is the end point of any teleologically specified process for Aristotle? Is it the "production" of a "perfect" result? Perhaps not, as I think perfection of matter in a form does not mean for Aristotle an ideal state of this *formed matter*. For example, if we talk about the production of material objects, the goal would be to make fully functional objects. For the purposes of reaching this functionality, the object is supposed to possess certain formal attributes. Any contamination which is getting in the

way of this functionality seems to be accidental and can be considered a failure of achieving this goal. However, while some failures definitely result in the lack of functionality, other failures just affect the degree of perfection in this functionality. A carpenter who aims to produce a chair might end up with a good sturdy chair, which will be perfectly functional. Or due to some accidental cause, either external (bad hammer or nails) or internal (mistakes in the measurement), the end result of his labor can be not a perfect chair (it reels or it is not comfortable to sit on). However, it is still going to be a chair which functions as a chair and it is hard to confuse it with, let us say, a bed or a table. The "imperfection" of a chair makes us refrain from buying it or using it. However, it can still be considered a chair and can be "perfectly" used as a chair in the circumstance when we do not have a better one. This example illustrates that *form* allows "imperfections" (deviations) which are still not ruining the definition of the object and therefore *form* can be further elaborated as a normative concept.

Going back to generation, owing to the proposed outline of the argument, it seems logical to infer that semen for Aristotle in its purposive effort through forming female matter does not endeavor to achieve a *perfect* person. Rather, matter and form in their development aim to achieve a person who will maintain the transition of species *form* to the next generation, including a variety of functions normally attributed to this species. In this conclusion, I second Connell's claim²⁸ that "Aristotle's ontology allows that within the range of what counts as natural or fully functional members of the kind, variations can be deemed better or worse, as with political constitutions..."²⁹ It applies to a mere difference in phenotype (where both a snub or a hook nose are not only fully serviceable but can even be aesthetically pleasing), and also to some real deviations which are still not beyond the limits of normality.

The final step of my argument aiming to prove that accidentals can be reconciled with the general course of teleology requires looking at

²⁸ Of course, similar conclusions appeared long before Connell's book. For example, see Preus 1979: 85.

²⁹ Connell 2016: 346–347

some difference in the understanding of conditional (hypothetical) necessity. In *Metaphysics* v.2, Aristotle states that we have two types of conditional necessity:

We call the necessary (1) that without which, as a condition, a thing cannot live, e.g. breathing and food are necessary for an animal; for it is incapable of existing without these. — (2) The conditions without which good cannot be or come to be, or without which we cannot get rid or be freed of evil, e.g. drinking the medicine is necessary in order that we may be cured of disease.³⁰

Conditional necessity (1) (strong version) talks about something indispensable, for example nutrition with regard to living beings. Or with respect to embryology, it can be something like having a heart or at least one working lung. Conditional necessity (2) (weak version) is something which makes existence of the particular entity better, like medicine in case of ailment, or having a second working lung, or a second working kidney. In a way, these two types of conditional necessity help us separate the lower form of living from the higher one. The strong version of conditional necessity includes steps preceding fulfillment which are necessary for the preservation of an organism and its definition as a member of a species. The weak version of conditional necessity includes steps which are necessary for a better life or as an end in itself, like a tail bone.

My contention is that weak conditional necessity is a type of necessity which allows the interference from forced necessity. Thus, the separable incidentals caused by forced necessity cannot be reconciled with the strong version of conditional necessity. But the existence of weak conditional necessity gives room for such a reconciliation.

In his biological works, we see Aristotle put together the normativity of the form and two versions of conditional necessity into one concept. In *On the Parts of Animals*, he deploys the concept which he calls the *second best*:

³⁰ *Metaph.* 1015a20–23.

So the best way of putting the matter [first best] would be to say that *because* the essence of man is what it is, *therefore* a man has such and such parts, since there cannot be a man without them. If we may not say this, then the nearest to it [second best] must do, viz. that there cannot be a man at all otherwise than with them, or, that it is well that a man should have them.³¹

The *first best* talks about some conditionally necessary attributes which constitute the essence in *what it is*. It explains how that or another aspect of physiology belongs to the essence of species. The *second best* talks about whether an entity is better or worse off with or without this attribute. An accidental deviation in the course of gestation caused by some forced necessity can interfere with the first best. In this case, it alters some essential attributes which constitute an entity in what it is. This type of deviation leads to a complete monstrosity or even to the state of non-being (miscarriage). An incidental interference with the second best leads to the formation of an entity with a number of accidental attributes which does not alter the essence in *what it is*. If we study this problem further, I think we should be in a position to argue that for Aristotle the second best can be understood in the negative and positive sense. Incidentals can be *declining* attributes and *profitable* as well. The argument that with some incidental attributes the entity can be either worse or better off turns us to the problem of how we can measure what is worse and what is better off. This concern brings us into the domain of ethics, but this issue is a subject of a further study best addressed in a separate research.

In Place of Conclusion

In the introduction, I proposed to examine Aristotle's claim from *Metaphysics* that there is no science of the accidental in relation to a broad understanding of accidental instances especially in Aristotle's biology. Contrary to what some commentators suggest,³² in this study

³¹ PA 640a33–b3. Translation by A.L. Peck

³² See, for example, Heinaman 1985.

I tried to show that there is probably no science of “unusual accidents” which correspond to serious monstrosities in generation. Aristotle obviously distinguishes between some unusual accidents and more general accidents regarding their relation to teleology. In this paper, I was concerned with both unusual accidents and mere accidents. It seems to be legitimate to conclude that there is probably no science of unusual accidents which in generation correspond to complete monstrosity when only “animality” is preserved. But clearly in different fields of his study (biology, logic, physics, metaphysics), Aristotle maintains the intention to explain the nature of different accidentals which are not rare or extreme, and he does propose the possibility of accounting for them within the discourse of four causes and general teleology.

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