

Aristotle on Non-Contradiction: Philosophers vs. Non-Philosophers

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Abstract:

Aristotle's principle of non-contradiction (PNC) has been interpreted by Łukasiewicz through three distinct formulations, namely ontological, logical, and psychological. Many have criticized Łukasiewicz's position, but they still maintain that Aristotle defends distinct formulations. In contrast, this paper shows that Aristotle suggests only one formulation of the PNC. This unique formulation belongs to philosophy as the first science, so that the philosophers think of the PNC as a necessarily true principle, owing to their meta-physical cognition of the nature of things. Yet, there is another way to understand this formulation. Indeed, the non-philosophers believe in the PNC, without being able to understand its necessary truth, due to their ignorance of philosophy. Thus, Aristotle has to convince them that the PNC is the most certain opinion of all, and his dialectical justifications are purposely weak, as they are only concerned with the defense of a common opinion.

In Chapter 3 of *Metaphysics Gamma*, Aristotle introduces the so-called principle of non-contradiction (hereafter PNC).¹ It is important to put this principle into context in order to understand why and how Aristotle introduces it:

It is proper for the one who best cognizes (*gnôrizonta*) each genus to be able to state the most certain principles (*archas*) of an actual thing, so that the one who cognizes beings, *qua* beings (*tôn ontôn hêi onta*), will also be able to state the most certain principles of all things. This is the philosopher. The most certain principle of all is about which it is impossible to be mistaken; for this most cognized principle has to be necessary (for everyone is deceived by things which they do not cognize) and not hypothetical. For it is necessary for the principle dealing with anything about beings not to be a hypothesis; and it is necessary for the one who cognizes anything about beings to cognize it, and it is necessary to have it present. Hence, it is clear that this principle is the most certain of all; and what this principle is, we can say it after all this. For it is impossible for the same thing to belong and not to belong simultaneously (*hama huparchein kai mê huparchein*) to the same thing and in the same respect (*kata to auto*) (and regarding all the other specifications that might be added, they have to be added against the dialectical difficulties (*pros tas logikas duschereias*)). (*Metaphysics Gamma*, 3, 1005b8-22)²

The PNC has been called metaphysical or ontological, as it pertains to the universal nature of things. This principle asserts that it is impossible for the same thing to belong

¹ We shall use the acronym PNC as a useful convention, but the expression 'principle of non-contradiction' (for which PNC stands) is nowhere to be found in Aristotle's works.

² All translations in this paper are my own, unless otherwise indicated. The two main English translations of *Metaphysics Gamma* are Ross (1924) and Kirwan (1993).

and not to belong to the same thing, both simultaneously and in the same respect. That is, if A is predicated of B, it is impossible for A *not* to be predicated of B, if these two opposite predications are both simultaneous and in the same respect. The condition of simultaneity (*hama*) excludes a changing predicate, in which A at time t_1 has changed into something else at time t_2 .³ The second condition is that the opposite predications must be in the same respect (*kata ta auto*), namely the predicate A and its denied predicate must be contradictories, and not just contraries. If this condition does not hold, contradiction cannot apply. For instance, if tall is predicated of a thing, it is still possible for tall *not* to be predicated of this same thing. Indeed, a tall thing can be regarded as not being tall towards a taller thing. The predicate and its denied predicate are simultaneous, but not in the same respect: while the thing is tall with respect to itself (e.g. a tall dog), it is not tall with respect to something taller (e.g. an elephant). In this case, the predication and its denial are contraries, but not contradictories. This means that, for a true (false) predication, its contrary may also be true (false), as opposed to its contradictory that will always be false (true).⁴

According to the above passage, the PNC is a principle, whose necessity implies that it cannot be otherwise. It is, therefore, not a hypothesis. It is said to be the most certain principle of all, as it cannot be mistaken. Yet, these claims must not be investigated out of context. Aristotle assesses the PNC in relation to the philosophers, namely the ones who investigate philosophy as a first science. The PNC is a necessary principle only for those who know about “beings, *qua* beings”. In other words, the ignorance of the first science prevents one from cognizing (*gnôrizonta*) the PNC, so that the cognition (*gnôsis*) of this principle is accessible only to the philosophers. If we lose sight of philosophy as a first science, we cannot understand its relation to physics as a second science, and we cannot then grasp the relevance of Aristotle’s discussion with the physicists in his defense of the PNC. *Metaphysics Gamma* makes us aware that philosophy (as meta-physics) is the only science able to account for the necessary principles of knowledge (*epistêmê*), which are beyond knowledge itself. This book starts with the claim that all particular sciences require a universal science about beings,

³ These times t_1 and t_2 are indivisible instants of time, distinct from the divisible intervals of time through which (continuous) change takes place (cf. Hudry 2009).

⁴ See chapter 10 of *De Interpretatione* regarding the distinction between the contrary (*enantia*) and the contradictory (*antikeimenê*).

qua beings, and the aim of this universal science is to provide the highest explanations about the nature of things. Here is the whole chapter 1 of *Metaphysics Gamma*:

There is a science that studies being, *qua* being (*to on hêi on*), and what belongs in itself to this. This is not the same as the ones that we call particular sciences; for none of these other sciences universally deal with being, *qua* being, but they cut off some part of being and study the attribute about it, e.g. as the mathematical sciences do. Since we are searching for the principles, i.e. the highest explanations (*aitias*), clearly it is necessary for them to be from a nature in itself. If then those who searched for the components of beings also searched for these principles, it is also necessary that the components of being are not by accident but *qua* being; that is why we must also grasp the primary explanations of being, *qua* being. (*Metaphysics Gamma*, 1, 1003a21-32)

The highest explanations are neither mathematical nor physical, but philosophical. This science is universal, in so far as it investigates the nature of things by reference to a universal genus, which comprehends all the particular genera studied by the particular sciences. A thing is said to be geometric when studied by geometry, or physical when studied by physics, so that a geometric thing is distinct from a physical thing. On the other hand, a thing is said to be meta-physical (or ontological), when its universal nature goes beyond the scope of the particular sciences. The non-philosophers are unable to grasp philosophy in the same way that the non-mathematicians are ignorant of mathematics. While the physicists and the mathematicians have nothing to say about the universal genus of things, the philosophers must comprehend what physics and mathematics say about the particular genera of things. This is explained by the fact that philosophy, as a first science, includes both physics (as a second science) and mathematics (as a third science). It is in this context that the PNC has to be understood. Its cognition depends on philosophy alone, so that the non-philosophers express an opinion about it, without being able to cognize it. We cannot, therefore, separate the explanation of Aristotle's PNC from the way this principle is either cognized or merely believed.

The study of the PNC by the commentators have been heavily influenced by Łukasiewicz (1910/1979), who investigates the principle itself, independently of the textual context. He divides the PNC into three formulations, namely an ontological, a logical, and a psychological formulation. Unlike the majority of the commentators, we shall suggest that the PNC has a unique formulation. In other words, there are not different formulations, but only different ways to deal with a unique formulation. On the one hand, the philosophers assume the necessary truth of an indemonstrable principle.

On the other hand, the non-philosophers share only a common opinion, whose truth cannot be necessary. Everyone has the ability to believe in the PNC, but only the philosophers have the capacity to understand the universal nature of things upon which the PNC is based. There is only one PNC, namely a philosophical one, and we shall reject the other two formulations coined by Łukasiewicz's reconstructed argument. It is clear that the primacy of philosophy, conceived of as a meta-physical science, could not be viewed as relevant by Łukasiewicz, namely a logician from the beginning of the twentieth century wanting to believe in the supremacy of mathematical logic. Nevertheless, we shall conclude that Aristotle's position in *Metaphysics Gamma* makes perfect sense, in so far as he focuses on the different audiences to which the PNC is addressed, without modifying the PNC itself, which belongs to one and only one universal science.

1. Łukasiewicz's additional formulations

Łukasiewicz's (1910/1979) is the first commentator who distinguishes three formulations of Aristotle's PNC:

Aristotle formulates the Law of Contradiction in three ways, as an ontological, a logical, and a psychological law; he does not make explicit the differences between them.

(a) Ontological formulation: 'It is impossible that the same thing should both belong and not belong to the same thing at the same time and in the same respect' (*Meta.* IV 3, 1005b19-20).

(b) Logical formulation: 'The most certain of all [principles] is that contradictory sentences are not true at the same time' (*Meta.* IV 6, 1011b13-14).

(c) Psychological formulation: 'No-one can believe that the same thing can [at the same time] be and not be' (*Meta.* IV 3, 1005b23-24). (1979, 50-1)

If many commentators are eager to criticize Łukasiewicz's interpretation, they still talk about logical and psychological formulations, as if such formulations were distinct from the ontological one.⁵ In fact, the strength of Łukasiewicz's argument is illustrated by his claim that Aristotle "does not make explicit the differences between them" (cf. above).

⁵ Wians (2006, 336, footnote 12) asserts: "It is widely recognized that Aristotle states the PNC in several quite different formulations (see, e.g., Kirwan 1993, 88-89; Łukasiewicz 1910/1979)". Likewise, Barnes (1969), Dancy (1975), Upton (1983), Code (1986), Cohen (1986), McKirahan (1992), Gottlieb (1994), Whitaker (1996), Politis (2004) and Wedin (2004ab) follow these additional formulations, despite different terminologies (e.g. Barnes underlines the psychological formulation with a "Law of Thought", whereas Gottlieb speaks of "doxastic" and "semantic" formulations).

This gives him freedom to reconstruct the argument, without paying too much attention to the intrinsic difficulties of Aristotle's text. Indeed, his aim is to stress a logical reconstruction of Aristotle's PNC, beyond metaphysics and psychology. In that respect, Łukasiewicz (1920/1957) is influenced by Frege's conception of logic as formal ontology, when he identifies Aristotle's syllogistic logic with a system of universalized, conditional propositions, understood as a formal ontology of logical truths. With respect to the PNC, he suggests a logical formulation, based on the one-one correlations between (logical) sentences and (ontological) states of affairs. He then concludes to the equivalence of the logical and the ontological formulations.⁶ Łukasiewicz also notices that the logical formulation does not have a proper logical foundation: "the Law of Contradiction has no *logical* value, since it only has the status of an assumption" (1979, 62, original emphasis). Nonetheless, he forgets to say that, if the logical formulation is a mere assumption, it is due to his own postulate that the ontological and logical formulations are equivalent. Since this equivalence is nowhere stated in *Metaphysics Gamma*, we may conclude that Łukasiewicz's objection is confined to his own reconstruction of Aristotle's position. Unless we think of Aristotle as a modern logician, like Frege or Russell, it is unsurprising to observe that the PNC has no logical foundation. It is even reassuring, since it underlines the well-known fact that Aristotelian logic is distinct from modern logic, as it does not imply a formal separation between syntax and semantics.⁷

Łukasiewicz also accuses Aristotle of "logicism in psychology", in so far as the logical formulation of the PNC seems to justify the psychological formulation:

Aristotle attempts to *prove* the psychological Law of Contradiction on the basis of the logical Law... Precisely formulated, Aristotle's proof of the psychological Law of Contradiction runs as follows: If two beliefs answering to contradictory sentences could exist at the same time in a single consciousness, then contrary properties would hold of that consciousness at the same time. But by the logical Law of Contradiction it is impossible for contrary properties to hold of a single object at the same time. Hence two beliefs answering to contradictory sentences cannot exist in a single consciousness at the same time. Aristotle's proof of the psychological Law of

⁶ Łukasiewicz (1910) writes: "Aristotle thinks that the logical and ontological formulations are logically *equivalent*; for he treats sentences as representations of objectives [states of affairs], with which he puts them in a one-one correlation... This one-one correlation between sentences and objectives entails the equivalence of the ontological and the logical Laws of Contradictions." (1979, 52; original emphasis).

⁷ See Hudry (2011) defending a mental conception of meaning in Aristotle by not applying the modern divide between syntax and semantics.

Contradiction is *inadequate* because he has not proved that beliefs answering to contradictory sentences are contraries... Aristotle falls into the common error of ‘logicism in psychology’—the converse of ‘psychologism in logic’. Instead of investigating mental facts, Aristotle considers the sentences answering to such facts, and the *logical* relations holding between such sentences. (1979, 52, 53, original emphases)

Following Łukasiewicz’s reconstruction, Aristotle reduces the psychological formulation to the logical formulation, itself equivalent to the ontological formulation. Łukasiewicz writes (cf. above): “by the logical Law of Contradiction it is impossible for contrary properties to hold of a single object at the same time”. He speaks of “logicism in psychology” because, according to him, Aristotle fails to provide a psychological formulation exclusively relying on opinions (i.e. independently of sentences). Once again, his criticism holds only if we agree with his initial postulate that there is a psychological formulation of the PNC, which has to be distinct from the logical formulation. Yet, Aristotle cannot make such a distinction, because sentences for him are nothing more than the verbal expressions of opinions in spoken language, so that what applies to sentences also applies to opinions. Thus, the truth or falsehood of sentences is not different from the truth or falsehood of opinions.⁸

Consequently, Aristotle and Łukasiewicz do not share the same postulates about the PNC. While Łukasiewicz assumes three distinct formulations, Aristotle makes only one formulation in relation to philosophy, such that the PNC is a necessary principle belonging to the first science. The formulation is the same for all, so that what is changing is only the way in which the audience understands it. While the philosophers define a scientific principle, the non-philosophers only express an opinion about this principle.

2. Ignorance of philosophy

⁸ The *Categories* (5, 4a23-28, 4a34-b1) asserts: “For the same sentence (*logos*) seems to be both true and false, for instance, if the sentence that someone is sitting is true, the same sentence will be false when this person will get up; and likewise for the opinion (*doxês*); for if we have the true opinion that someone is sitting, when this person gets up, and if we hold the same opinion, we will have a false opinion... Sentence and opinion remain completely unchanged in every way, and because of a change of the actual thing (*pragmatos*) the contrary comes to pertain to them; for the sentence that someone is sitting remains the same, and because of a change of the actual thing it comes to be true at one time and false at another; and likewise for the opinion.”

For the ones who ignore philosophy, the PNC is nothing more than a common opinion. Aristotle's main audience in *Metaphysics Gamma* is the non-philosopher, who is both the scientist (such as the physicist or the mathematician) and the non-scientist (such as the dialectician or the sophist). Aristotle has to convince them that the PNC, being the most certain principle of all, is the most certain opinion of all. Everyone must believe in the PNC, meaning that every scientist, who produces some demonstrative knowledge from the particular sciences, must hold the PNC as the ultimate opinion:

This is plainly the most certain of all principles; for it has the aforesaid characteristic. For it is impossible for anyone to believe that a same thing is and is not, as said by Heraclitus according to some. For it is not necessary to agree with what has been said [by Heraclitus]; if it is not possible for opposites to belong to the same thing simultaneously (and let us also add the usual specifications to this premise), and if an opinion is the opposite of an opinion as a contradiction, it is evident that it is impossible for the same person to believe that the same thing is and is not simultaneously; for the one who would be deceived on this point would have opposite opinions simultaneously. That is why all those who use demonstrations refer to this as an ultimate opinion (*eschatên doxan*); for this is also by nature the principle of all the other axioms. (*Metaphysics Gamma*, 3, 1005b22-34)

The ultimate opinion consists in believing that the PNC is a meta-physical principle, from which all demonstrative knowledge is made possible. This true opinion is justified by the fact that a person is not different from a thing. Since it is impossible for a same thing to have contradictory predicates, it is also impossible for a same person to hold contradictory opinions. The impossibility of having contradictory opinions justifies the ultimate opinion about the PNC. This is a way for the non-philosophers to be convinced by the PNC, in so far as their ignorance of the first science prevents them from cognizing the universal nature of things, upon which the PNC is based. In that respect, they are only able to believe in the PNC, without going into the investigation of this meta-physical principle. While the philosophers assert the necessary truth of this principle, the non-philosophers only assess the accidental truth of an opinion. This distinction can be illustrated as follows. We believe that modern sciences are true, even though only the scientists properly know the scientific principles, so that that they are able to explain to us why we are right to hold such true opinions about these modern sciences. For instance, a physicist is able to justify the Newtonian principle of gravitation as proper science, unlike a non-physicist, who only believes in its truth through a mere opinion. This does not mean that there is a psychological formulation of this principle, distinct from the physical formulation. Likewise, Aristotle does not

suggest a psychological formulation of the PNC, different from the meta-physical formulation. There is only one PNC, the one established by philosophy, and Aristotle wants to make sure that the non-philosophers have a true opinion about this scientific principle.

As long as philosophy is not investigated as the first science, i.e. as a universal science with respect to all particular sciences, the PNC cannot be defined as a meta-physical principle, i.e. as the most certain of all scientific principles. Thus, when *Metaphysics Beta* deals with the PNC, independently of the science to which it belongs, Aristotle merely speaks of it as a common opinion.⁹ All principles of demonstrations are viewed as “common opinions” (*koinai doxai*), since the science to which they belong is not yet identified. In *Metaphysics Beta*, Aristotle does not even know whether these common opinions pertain to one or several sciences (and this question will receive a definite answer only in *Metaphysics Gamma*):

But also it is debatable whether there is one science or more about the principles of demonstrations (I mean by the principles of demonstrations the common opinions (*koinai doxas*) from which everyone makes a proof), e.g. that it is necessary for everything to be either affirmed or denied, that it is impossible for a thing to be and not to be simultaneously, and all other premises of this kind, the question being whether there is only one science of these premises and of substance, or a different one, and if there is not one science, which of the two needs to be identified with that which we now seek. (*Metaphysics Beta*, 2, 996b26-33)¹⁰

The principles of demonstrations are common opinions for the ones who make proofs, meaning that the scientists, using demonstrations in their investigation of a particular science, admit indemonstrable principles. Aristotle’s two instances of common opinion are the PNC (i.e. “it is impossible for a thing to be and not to be simultaneously”) and

⁹ Ross (1924) prefers to translate *koinē doxa* as ‘common belief’ instead of ‘common opinion’, as the term ‘belief’ seems to account for something more stable than ‘opinion’ (and this is partly due to the modern conception of knowledge understood as ‘justified true belief’). Yet, such a distinction has no textual basis in Aristotle, and this paper uses the term ‘opinion’, without implying a somewhat anachronistic distinction between opinion and belief.

¹⁰ Here is the other passage from *Metaphysics Beta* (2, 997a15-25) speaking about “common opinions”: “In general, is there one science or several ones about all substances? If there is not one, to which substance this science has to be assigned? On the other hand, it is not reasonable for one science to deal with all; for then one science would be demonstrative about all attributes, if indeed every demonstrative science about some underlying thing (*hupokeimenon*) studies its attributes in themselves from the common opinions (*ek tōn koinōn doxōn*). Hence, the study, for a same genus, of the attributes in themselves pertains to the same science from the same opinions. For there is one science about the genus, and one from the opinions, whether the science is the same or another, so that the attributes are also studied either by these sciences or by only one of these.”

the principle of the excluded middle (i.e. “it is necessary for everything to be either affirmed or denied”). These principles are merely assumed, without being cognized, as they do not belong to the same science as the demonstrated conclusions. In *Metaphysics Gamma*, Aristotle investigates these two common opinions by connecting them with philosophy as the first science (cf. chapters 3-6 for the PNC, and chapter 7 for the excluded middle). This universal science transforms these mere opinions into meta-physical principles, whose necessary truth provides some epistemic foundation to the demonstrative knowledge of each particular science. In other words, only the philosophers can explain why a particular science amounts to demonstrative knowledge, and why the PNC is an indemonstrable principle of demonstrative knowledge.

Philosophy is a universal science, based on the universal genera of things, which are investigated through indemonstrable principles, as opposed to the particular genera of things, studied through the demonstrations of the particular sciences. *Metaphysics Gamma* analyzes the role of the philosopher with respect to the other kinds of scientist, namely the geometer and the physicist:

We must say whether to deal with axioms, as called in mathematics, and with substance (*ousias*) pertains to one or two different sciences. It is evident that the inquiry into these axioms pertains to one science, i.e. the one of the philosopher; for these belong to all substances, and not to a particular genus separate from others. Everyone also uses them, because they are about being, *qua* being (*tou ontos hêi on*), and each genus is a being; but they use them just so far as they need them, i.e. as far as the genus from which they demonstrate extends; hence, since it is clear that the axioms belong to all genera, *qua* beings (for this is what is common to them), the study about them pertains to the one who cognizes (*gnôriszontos*) being, *qua* being. That is why anyone who is conducting a particular inquiry tries to say nothing about their truth or falsehood, i.e. neither the geometer nor the arithmetician, but some physicists have done it, quite unsurprisingly; for they thought to be the only ones to study the whole of nature, i.e. being. Since there is someone still further above the physicist (for nature is one particular genus of being), the inquiry into these axioms will pertain to the one who studies the universal, i.e. the primary substance (*tên prôtên ousiam*); physics is also some wisdom (*sophia tis*), but not primary. (*Metaphysics Gamma*, 3, 1005a19-b2)

This passage explains how philosophy is a meta-physical science. First, Aristotle repeats the question asked in *Metaphysics Beta*, i.e. whether the principles (axioms) belong to either one (universal) science or several (particular) sciences. His reply is that the principles must be about a universal science, whose scope includes all substances. Philosophy is the universal science, as there is nothing prior to it, unlike physics that is

subsumed under philosophy.¹¹ Therefore, anyone investigating the demonstrative knowledge of a particular science must assume some philosophical principles, but they do so only in so far as the particular genus, which they study, is concerned with them. For instance, the geometers presuppose the PNC only with respect to geometric magnitudes, namely things whose particular genus is continuity (since every magnitude is continuous by definition). Likewise, the arithmeticians postulate the PNC only with respect to numbers, namely things whose particular genus is plurality (since every number is plural by definition). As for the physicists, they admit the PNC only with respect to physical things, namely things whose particular genus is motion (since every physical thing is movable by definition). In contrast, the philosophers *define* the PNC with respect to all (composed) substances, namely things whose universal genus is being (since every composed substance exists by definition). In other words, the PNC, as a meta-physical principle, is connected with the what-being-is (*to ti ên einai*) for a thing (i.e. the primary substance for a composed substance). *Metaphysics Zeta* (cf. 11, 1037a21-b7) distinguishes the primary substance (*prôte ousia*) from the composed substance (*sunolos ousia*). While the primary substance is the form (*eidos*) of a particular thing, the composed substance is the particular thing itself, i.e. the compound of the form and the matter. Thus, the philosophers assert the necessary truth of the PNC by defining the primary substances (the universal genera) of all things. On the other hand, the physicists, the geometers, and the arithmeticians cannot assess the necessary truth of the PNC, since they disregard the universal genera of all things. They investigate only particular genera, whether it is of all movable things, of all geometric magnitudes, or of all numbers.

Aristotle even criticizes the non-philosophers, who want to prove the truth of the PNC. He accuses them of ignoring analytics, as they do not know that the principles of demonstrations are indemonstrable premises. That is, the cognition (*gnôsis*) of an indemonstrable premise is not of the same kind as the knowledge (*epistêmê*) of a

¹¹ *Metaphysics Epsilon* (1, 1026a27-31) asserts: “If then there is no substance other than those formed by nature, physics will be the first science; but if there is some immovable substance, the science of this is prior, it is first philosophy, and is universal in this way, because it is first” (cf. also *Metaphysics Kappa*, 7, 1064b9-14). On the unity of science in Aristotle, see Ferejohn (1991).

deduced conclusion. Only the philosophers are able to investigate the principles of deductions, which lie outside the scope of all the particular sciences:

All the attempts for some to state the way in which we must accept truth are due to their ignorance of analytics (*di' apaideusian tôn analutikôn*); for they must understand this beforehand, and not to search for it while listening. Hence, it is clear that it falls to the philosopher, i.e. to the one who studies the whole of substance (*ousias*) according to its nature, to inquire into the principles of deductions (*peri tôn sullogistikôn archôn*). (*Metaphysics Gamma*, 3, 1005b2-8)

Philosophy, as a meta-physical science, is prior to the demonstrative knowledge of all the particular sciences, meaning that the necessarily true principles expressed by philosophy cannot be proved through demonstrations. The *Posterior Analytics* (cf. A, 12, 77a36-b15) confirms that the physicists and the mathematicians have to restrict their respective investigation to their own, particular science: “hence, we do not have to ask each scientist (*epistêmona*) every question, nor does he have to answer everything that he is asked about anything, but only those questions confined to his science (*epistêmên*)” (77b6-9). When the geometers prove that every triangle has angles equal to two right angles, it is sufficient for them to assume the truth of the PNC as a common opinion. On the other hand, when the philosophers investigate the substance of a triangle, they first have to cognize the PNC as a meta-physical principle. Indeed, there would be no possible cognition of the what-being-is (*to ti ên einai*) for a triangle, without the precognition of the PNC. When defined by a geometer, a triangle is nothing more than a geometric magnitude (quantity), but when defined by a philosopher, a triangle is a composed substance (compound of form and intelligible matter), whose primary substance (form) is abstracted (separated) in thought.

Aristotle's assertion of the PNC takes place in *Metaphysics Gamma*, and not in the *Posterior Analytics*, since the PNC is an indemonstrable principle outside the scope of demonstrative knowledge. The *Metaphysics* does not introduce philosophical definitions in the form of deduced conclusions, meaning that primary substances (i.e. the definitions of composed substances) are independent of demonstrations. The philosophers provide definitions through intellection (*nous*), and the *Posterior Analytics* understands intellection as follows: “by intellection I mean a principle of knowledge (*archên epistêmês*)” (A, 33, 88b36). It is only through intellection that the PNC is cognized as a necessary principle in relation to the definition of being, *qua* being. Therefore, when the non-philosophers claim to search for proofs about the PNC, they

immediately show their ignorance by not being able to distinguish demonstrative knowledge from its indemonstrable principles. *Metaphysics Gamma* asserts:

Some, due to their ignorance, also expect to demonstrate this [PNC]; for it is ignorance not to recognize for which things a demonstration must be searched, and for which things it must not be; for, in general, it is impossible that there is a demonstration of everything (for it would go on to infinity, so that there would not even be a demonstration), and if there are some principles for which a demonstration must not be searched, they cannot say which one they expect to be more a principle of that kind. (*Metaphysics Gamma*, 4, 1006a5-11)

In the absence of indemonstrable principles, demonstrative knowledge would be impossible, since every premise would be the deduced conclusion of another demonstration, and so on. In other words, demonstrations would be *ad infinitum*, so that it would be impossible to reach some true, indemonstrable postulates. The impossibility to stop this infinite regress would prevent demonstrations from asserting knowledge. Only indemonstrable principles can provide demonstrative knowledge with some foundation. The *Posterior Analytics* (A, 3, 72b23-25) corroborates this view: “we say that there are not only [demonstrative] knowledge but also some [indemonstrable] principle of knowledge by which we cognize (*gnôrizomen*) the definitions”.¹² Thus, any attempt to demonstrate the PNC would transform it into a deduced claim within demonstrative knowledge, so that the PNC could not be a principle of demonstrative knowledge anymore. This means that, through intellection, the philosophers have to cognize the PNC as a necessary condition for definition and demonstration. The absence of proof confirms that the PNC cannot belong to a particular science, and must thereby resort to a universal science prior to demonstrative knowledge.

3. Two kinds of non-philosopher: the physicist and the dialectician

To say that the PNC is the most certain opinion of all constitutes a weak claim, since every opinion is true by accident. Thus, Aristotle has to convince the non-philosophers that the PNC cannot be a false opinion. There are two ways of challenging the PNC: while some scientists may object to the use of the PNC for scientific reasons, some

¹² Aristotle adds: “We say that not all knowledge is demonstrative, but that which is about the immediates (*amesôn*) is indemonstrable (and that this is necessary is evident; for if it is necessary to know the things which are prior, i.e. from which we have the demonstration, and if it stops at some point with the immediates, it is necessary for these to be indemonstrable)” (*Posterior Analytics* A, 3, 72b18-22).

non-scientists will merely question the use of the PNC in spoken language. To these two distinct kinds of objection, Aristotle suggests two distinct kinds of reply:

The method of discussion is not the same for all, since some require to be convinced, others to be defeated. If they have this opinion [against the PNC] as a result of perplexity (*aporêsai*) their mistake is easy to remedy, for the conflict is not with their discourse (*logon*) but with their thinking (*dianoian*). But if they state it for the sake of stating it, the remedy is a refutation (*elenchos*) of their account in the spoken sound (*phônêi*), i.e. in names (*onomasin*). (*Metaphysics Gamma*, 5, 1009a16-22)

Some physicists may hold arguments, leading to the view that PNC is a false opinion. They will do so, if they restrict the nature of things to their motion, concluding that every thing is endlessly changing. Indeed, the PNC is irrelevant to things, whose ceaseless changing nature makes them indefinite. Aristotle has to find a satisfactory answer to this scientific objection. He must explain to these physicists how motion can be compatible with the PNC. Notice how Aristotle makes a distinction between discourse (*logos*) and thinking (*dianoia*), so that the objection from the physicists is based on a mental conception of meaning, independently of language. This shows that the mental contents in thoughts are not identified with the semantics of a given language.¹³

The rejection of the PNC, when suggested by the physicists, is a direct challenge against philosophy as the first science, because if the PNC were threatened by motion, physics would have to be the first science, dealing with beings, *qua* movable beings. It would mean the irrelevance of philosophy, as the science of beings, *qua* beings. In fact, Aristotle acknowledges the privileged access of physics to the nature of things. As seen earlier, physics is said to be “some wisdom (*sophia tis*) but not primary”, unlike philosophy (*Metaphysics Gamma*, 3, 1005b1-2). The physicists understand the nature of things through change and motion, leading Aristotle to state in chapter 1 of *Physics III*: “since nature (*phusis*) is a principle of motion and change (*archê kinêseôs kai metabolês*), and since our enquiry is about nature, we should not ignore what motion is; for to ignore it is necessarily to ignore nature” (200b12-15). The investigation from the physicists does not go beyond motion and change, meaning that they do not define, unlike the philosophers, the primary substance of a physical thing, namely the what-being-is (*to ti ên einai*) for this thing. The primary substances are philosophical

¹³ With respect to Aristotle, it is mistaken to talk about semantics as a theory of meaning. See Hudry (2011).

definitions, abstracted from the composed substances, whose motion and change are studied by the physicists.

The physicists challenge the PNC, when they think of motion and change as exhausting the nature of things. If being is reduced to change, then the indefiniteness of being allows the same thing from having two contradictory predicates. In his reply, Aristotle targets the followers of Anaxagoras, Empedocles, and Democritus, who identify the nature of things with changing perceptions, so that things are deemed to have indefinite substances (cf. *Metaphysics Gamma*, 5, 1009a27-30, b15-20). Aristotle urges these physicists to believe in a universal science, which defines things beyond physical phenomena, i.e. without motion and change: “we shall ask them to believe also that there is some other substance of beings (*tôn ontôn*) to which neither motion nor destruction nor generation of any kind belongs” (5, 1009a36-38). Aristotle appeals to the meta-physical nature (as primary substances) of things, distinct from their physical nature (as composed substances). In that respect, physics cannot be the first or universal science, and must be superseded by a prior science called philosophy. Despite their ignorance of philosophy, Aristotle tries to convince the physicists to accept primary substances: “they must be shown, and they must be convinced, that there is a certain nature without motion (*akinêtos*)” (5, 1010a33-35). In other words, physics depends upon another science of which the physicists have no knowledge, explaining why they have to believe in the philosophical PNC, without being able to assess its necessary truth.

After having established that there is a higher science than physics, Aristotle must now explain how motion and change are compatible with the PNC. That is, the physical account of beings, *qua* movable beings, does not jeopardize the meta-physical definition of beings, *qua* beings. Aristotle uses the definition of motion from *Physics III*, in which motion is said to be “an entelechy of being in potentiality, *qua* potentiality” (*tou dunamei ontos entelecheia, hêi toiouton*) (1, 201a10-11). The distinction between potentiality and entelechy enables Aristotle to think of two simultaneous opposites, which are not in the same respect, meaning that the account of a thing in motion does not provide the physicists with an objection to the PNC:

In response to those, whose opinion rests on these grounds [i.e. that opposites simultaneously are and are not], we shall say that in one sense they speak correctly, but in another sense they are ignorant; for being (*to on*) may be said in two ways, so that there is a way in which it is

possible for something to come from not-being (*tou mê ontos*), while in another way this is not possible, i.e. the same thing cannot simultaneously be both a being and a not-being (*on kai mê on*), unless it is not in the same respect; for it is possible for the opposites to be simultaneously the same thing in potentiality (*dunamei*), but not in entelechy (*entelecheiai*). (*Metaphysics Gamma*, 5, 1009a30-36)

We can realize how motion threatens the PNC. For instance, an acorn comes from an oak tree, and an oak tree comes from an acorn, so that it is tempting to claim that an acorn is both an oak tree and not an oak tree. In other words, neither an oak tree nor an acorn seems to be a definite thing. Aristotle's solution is to speak of a thing in two ways, as being either actual or potential. If we say that an acorn is both an oak tree and not an oak tree, we speak of something simultaneous but not in the same respect. While an acorn is an oak tree in potentiality, it is not an oak tree in entelechy. Philosophy, as the first science, tells us that the what-being-is (or primary substance) for an acorn is not the same as the what-being-is for an oak tree, so that each of these two things has a distinct, definite meta-physical nature. Change and motion preserve their respective beings, and thereby the PNC, because if an oak tree belongs to an acorn in potentiality (as an acorn is an oak tree potentially), it does not belong to it in entelechy (as an acorn is not an oak tree actually). These opposite predications are contraries, but not contradictories, since they are not in the same respect. Thus, it is true to say that an acorn is both an oak tree (in potentiality) and not an oak tree (in entelechy). It means that the physicists are right to believe in the truth of simultaneous opposites, owing to the nature of motion, but this does not imply the rejection of the PNC. No claims made by physics, as a particular science, go against philosophy, as a universal science.

Aristotle draws a sharp distinction between the physicists and the ones who reject the PNC in discourse. While the former offer serious objections about the knowledge of actual things, the latter merely play with language, without involving (let alone threatening) inductive cognition (*gnôsis*) and deductive knowledge (*epistêmê*). Aristotle asserts: "what is found perplexing (*aporoumenon*) is not whether it is possible that the same should simultaneously be and not be a man in the name (*onoma*), but in the actual thing (*pragma*)" (*Metaphysics Gamma*, 4, 1006b20-22). As opposed to the physical objections that challenge the way in which the philosophers cognize actual things, the linguistic objections exclusively focus on meaningful spoken sounds. Aristotle speaks of "refutation (*elenchos*) of their account in the spoken sound, i.e. in names" (5, 1009a20-22). *De Interpretatione* identifies not only a name but also a sentence with

a “meaningful spoken sound” (*phônê sêmantikê*) (2, 16a19; 4, 16b26). Their meanings are arbitrary, as they depend upon linguistic conventions: “I say ‘by convention’ (*kata sunthêkên*) because no name is a name by nature (*phusei*) but only when it has become a symbol (*sumbolon*)” (2, 16a26-28).¹⁴ The *Posterior Analytics* (B, 7, 92b4-11) underlines the linguistic arbitrariness of names, when it claims that the name ‘goat-stag’ “means something” (*sêmanei ti*), despite the impossibility of cognizing an actual thing, i.e. a goat-stag. This explains why Aristotle does not worry about the linguistic objections formulated by the dialecticians and the sophists. Dialectic and sophistic are very different from either philosophy or physics, as they are neither universal nor particular sciences. *Metaphysics Gamma* (cf. 2, 1004b17-26) claims that philosophy “cognizes” (*gnôristikê*), dialectic “questions” (*peirastikê*), and sophistic “appears” (*phainomenê*) to cognize but does not do so. The difference between dialectic and sophistic is that, while the former challenges philosophy, the latter imitates philosophy. There is something dishonest in sophistic, which aims to fake philosophy, as opposed to dialectic, genuinely criticizing philosophical cognition. Regardless of this difference, both fail to produce serious objections to scientific arguments (whether they are philosophical, physical, or mathematical), since their expressed opinions cannot account for scientific principles.

Aristotle’s linguistic solution to the dialectical or sophistical objection to the PNC discards the possibility of a direct proof, since a demonstration *simpliciter* rests on a *petitio principii*. In contrast, he suggests an indirect proof, called refutation (*elenchos*):

I say that demonstrating by refutation (*elenktikôs apodeixai*) and demonstrating are different, because in a demonstration one might be thought to beg the point at issue (*aiteisthai to en archêi*), but if someone else (*alou*) is responsible for such a thing, there will be refutation (*elenchos*) and not demonstration. (*Metaphysics Gamma*, 4, 1006a15-18)

If Aristotle wanted to resort to a demonstration *simpliciter* in order to justify the use of the PNC in spoken language, he would have had no other choice but to assume the PNC in the premises of his demonstration, meaning that the exact thing to prove would

¹⁴ Aristotle holds the same view regarding sentences: “Every sentence is meaningful, not as a tool but, as we have said, by convention” (*De Interpretatione*, 4, 16b33-17a2). The expression ‘not as a tool’ (*ouch hôs organon*) is a direct criticism of Plato’s position, which views names and sentences as ontological tools, mirroring the nature of things they signify (cf. *Cratylus*, 388b-c, 389d-390a). About Aristotle’s notion of linguistic convention, see Kretzmann (1974).

already have been granted in the premises. It would have been a circular argument or *petitio principii*, namely a fallacy. Let us imagine the following dialogue:

- I want to prove the use of the PNC in spoken language.
- Do you mean that the denial of your affirmation is false?
- Yes, since I do not want to contradict myself.
- So, you already assume the use of the PNC in the premises of your proof, meaning that you are begging the point at issue.

The direct proof (or demonstration *simpliciter*) of the PNC is a *petitio principii* of the form: ‘we prove the use of the PNC in language by using the PNC in the premises of our proof’. The circularity of the argument implies its failure.¹⁵

Aristotle avoids the circularity of the direct proof by resorting to an indirect proof, called refutation. It is a matter of reversing the burden of proof by showing that it is impossible to justify the absence of the PNC in spoken language. That is why Aristotle says that “someone else” (*allos*) is made responsible for the *petitio principii* (cf. above), meaning that the dialecticians or the sophists, who happen to be against the use of the PNC in language, will nevertheless assume the PNC in any of their statements. We can illustrate Aristotle’s refutation as follows:

- Do you believe in the use of the PNC in spoken language?
- No, I do not believe in the PNC.
- Do you mean that the denial of your affirmation is true?
- No, I do not want to say that I believe in the PNC.
- So, you already assume the use of the PNC, when you claim that you do not believe in the PNC.

¹⁵ The *Prior Analytics* (B, 16, 64b28-30, b34-38) explains why to beg the point at issue leads to an argumentative failure: “To beg and to assume the point at issue (*to d’ en archêi aiteisthai kai lambanein*) is a kind of failure to demonstrate what is suggested... Since some things are naturally known through themselves, and other things by means of something else (for the principles are known through themselves, but what are below the principles are known through something else), and whenever someone tries to prove through itself that which is not known through itself, he then begs the point at issue (*tot’ aiteitai to ex archês*).” Aristotle suggests an instance of *petitio principii* with the impossibility of proving the geometric axiom of parallels: “This is just what those people do, who suppose that they draw proofs that there are parallels; for they fail to notice that they themselves assume what is not possible to demonstrate if there are no parallels. Hence, it turns out that those who deduce in this way are saying that each thing is so, if each thing is so; but in this way everything would be known through itself; and this is impossible.” (*Prior Analytics* B, 16, 65a4-9; cf. also Euclid’s *Elements*).

Aristotle's strategy is to force the dialecticians or the sophists, who are against the PNC in language, to beg the point at issue, and thereby to assume the PNC.¹⁶ Their fallacious argument is of the form: 'we reject the use of the PNC by using the PNC'. Aristotle can then conclude to the impossibility of denying the use of the PNC in spoken language.

This refutation does not directly prove that the opinion about the PNC is true. It merely transfers the burden of proof from Aristotle to the PNC-opponent. Here is how Aristotle explains his strategy:

The starting-point of all these argumentations is not to ask that we state something either to be or not to be (for that might well be believed to beg the point at issue (*to ex archês aitein*)), but at least that we mean something to both ourselves and someone else; for this is necessary, if we really say anything. For if we do not, there would be no discourse (*logos*) in response to either ourselves or anyone else. But if we grant this, there will be demonstration [in the manner of refuting]; for there will already be something definite (*hôrismenon*). Yet, the responsible for this is not the one who demonstrates [in the manner of refuting] but the one who upholds; for he upholds a discourse, while suppressing a discourse (*anairôn gar logon hupomenei logon*). As yet, anyone who agrees with this has agreed that something is true without demonstration [*simpliciter*], so that it is not true that everything will be so and not so. (*Metaphysics Gamma*, 4, 1006a18-28)

Aristotle examines the different conditions for the refutation to take place.¹⁷ First, no direct proof of the PNC is possible, since it would only beg the point at issue. Second, the one who wants to defend the PNC has to say something meaningful, so that a discussion with the PNC-opponent becomes possible. Third, the transfer of the burden of proof happens when the PNC-opponent makes a claim. The key moment is expressed

¹⁶ Aristotle's method of refutation is close to Plato's in his early dialogues. In the *Meno*, Socrates refutes the slave boy's false opinion by making him admit new premises, without warning him explicitly that to accept these new premises will lead him to reject his initial opinion. Cf. Vlastos (1999).

¹⁷ Aristotle asserts the exact same point in *Metaphysics Kappa*: "There is a principle in substances about which we cannot be mistaken, and about which it is always necessary to produce what is contrary, and I mean by this to say the truth, i.e. that it is not possible for a same thing to be and not to be in relation to one and the same time, and likewise for any other similar opposites. About these matters there is no demonstration *simpliciter* (*haplôs*), but one in relation to a person [who rejects PNC]; for we cannot produce a deduction from this most certain principle, but this should be so if there were to be a demonstration *simpliciter*. Against the one who speaks of opposite assertions, if we want to prove why it is false, we have to make him assume something which will be the same as the view that it is not possible for a same thing to be and not to be in relation to one and the same time, but such that it will not seem to him to be the same; for this will be the only possible demonstration against someone who claims that opposite assertions can be truly made about the same thing." (5, 1061b34-1062a11). Some doubt the authenticity of Book *Kappa*. Since the views about the PNC in *Kappa* are in agreement with the ones in *Gamma*, we shall leave this historical question unanswered.

as follows (cf. above): “he upholds a discourse, while suppressing a discourse”. This means that, as soon as the PNC-opponents make a statement, they immediately destroy it by assuming the truth of its contradictory denial. In other words, the only way to avoid destruction is to assume the PNC as a true opinion, such that it is false to contradict every affirmation by its denial. Aristotle concludes (cf. above): “anyone who agrees with this has agreed that something is true without demonstration [*simpliciter*]”. That is, the PNC-opponents have no other choice but to believe in the truth of the PNC, and they do so implicitly, without requiring any proofs that this opinion is true.

Aristotle’s refutation is an indirect proof, which only shows that it is wrong not to believe in the PNC. If the PNC-opponents decide to stay silent, no refutation takes place, because no wrong opinion is there to be refuted. Indeed, their silence prevents the burden of proof from being transferred to them:

We can demonstrate by refutation (*apodeixai elenktikôs*) that even this view [against the PNC] is impossible, if only the disputant says something. If he says nothing, it is absurd to search for a discourse (*logon*) in response to the one who holds a discourse about nothing, in so far as he holds no discourse; for such a person, in so far as he is such, is similar to a plant (*phutôi*). (*Metaphysics Gamma*, 4, 1006a11-15)

The refutation rests on the meaningful assertions made by the PNC-opponents. In the absence of assertions, their implicit acceptance of the PNC cannot be established. Aristotle compares these silent PNC-opponents to plants, which are living beings without voice (unlike animals). Accordingly, there is no refutation, if there is no sentence (*logos*), namely no meaningful spoken sound. More precisely, the sentence has to be declarative (*apophantikos*), meaning that it has to be either true or false.¹⁸ Furthermore, since a refutation depends upon a sentence expressed by some individual, its scope is confined to an individual opinion held against the PNC. We may then understand such a refutation as an argument *ad hominem* (to the person). This is not a fallacy, but a weak argument, which only takes place in a dialectical context (discussion), and cannot be generalized to every opinion held against the PNC.

¹⁸ *De Interpretatione* (4, 17a2-7) states: “Not every sentence is declarative (*apophantikos*), but only those to which truth or falsehood belongs. We cannot say it about all sentences: a prayer is a sentence but is neither true nor false. Let us leave aside all the other sentences (since consideration of them rather belongs to the domain of rhetoric or poetry). Only the declarative sentence belongs to the present study.”

Aristotle is aware that his defense of the PNC requires a dialectical context. That is why he speaks of dialectical difficulties, when he asserts the PNC: “For it is impossible for the same thing to belong and not to belong simultaneously to the same thing and in the same respect (and regarding all the other specifications that might be added, they have to be added against the dialectical difficulties (*pros tas logikas duschereias*))” (*Metaphysics Gamma*, 3, 1005b19-22). Dialectic is unrelated to the necessary truth of the PNC, as scientifically investigated by philosophy, but concerns the common opinion held by the non-philosophers. Aristotle has to discuss with the dialecticians and the sophists in order to refute their opinion against the use of the PNC in language. He also has to convince the physicists to use the PNC in the study of actual things, and a dialectical context is also required, since the physicists have no scientific cognition of philosophy. Nevertheless, the dialectical method of refutation is irrelevant in the case of the physicists, since their criticism of the PNC is not based on language.¹⁹ In that respect, the physicists are dialecticians with respect to philosophy, but are not so with respect to their own science.

4. Principle vs. opinion

The distinction between philosophers and non-philosophers is the best way to explain why the PNC is true both as a necessary principle (with respect to the philosophers) and as a common opinion (with respect to the non-philosophers). If we disregard this contrast, we cannot understand why Aristotle takes so much care in his defense of the PNC as a true opinion, while he first introduces it as the most certain principle of all. Łukasiewicz is unable to resolve this apparent dilemma, and eventually concludes about Aristotle: “he may himself have felt the weakness of his arguments; and that may have

¹⁹ Hamlyn (1990, 469) stresses the role of dialectic: “The argument which Aristotle uses in *Metaphysics IV* to refute those who dispute the Principle of Non-Contradiction, considered as a metaphysical principle about ‘what is’, is generally and quite rightly regarded as the example *par excellence* of Aristotelian dialectic used with a serious purpose. It might be characterized as presenting the sceptic with a dilemma: either he speaks or he does not; if he does he must presuppose the principle; if he does not he cannot deny it; so he must accept it.” Notice that the skeptic here is the dialectician or the sophist, i.e. the one who challenges the use of the PNC in spoken language (as opposed to the physicist who challenges the use of the PNC in actual things). For the role of dialectic in relation to the PNC, see also Irwin (1977) and Lear (1980). In contrast, some ignore the role of dialectic, e.g. Wedin (2004ab).

led him to present his Law as an ultimate *axiom*—an unassailable *dogma*” (1979, p. 62, original emphases). Others have used Aristotle’s weak justifications as a way to illustrate the failure of the PNC as a logical principle.²⁰ Such interpretations, or rather reconstructions, ignore the context in which the PNC is asserted, in so far as the PNC is said to be a principle belonging to philosophy, as the first science, namely a universal science whose scope is beyond all the particular sciences. The PNC, as a necessarily true principle, is unrelated to dialectical difficulties, since the philosophers have directly access to this principle. For anyone else, a dialectical context is required, in which Aristotle tries either to convince the physicists of the use of the PNC in actual things or to refute the dialecticians and the sophists in their rejection of the PNC in spoken language.

Consequently, when Aristotle reaches his conclusion at the end of chapter 6 of *Metaphysics Gamma*, he identifies the PNC with the most certain opinion of all, and his claim is exclusively addressed to the non-philosophers (and in particular to the physicists):

Hence, enough has been said about the most certain opinion (*doxa*) of all that opposite assertions are not true simultaneously, and about what follows from some who say that they are [true simultaneously], and about why some say this; since it is impossible for contradictories to be simultaneously true in relation to the same thing, it is evident that it is also not possible for opposites to belong to the same thing simultaneously; for, regarding opposites, one of the two is no less a privation (*sterêsis*), i.e. the privation of a substance; and privation is the denial (*apophasis*) of a definite genus; hence, if it is impossible to affirm and to deny simultaneously and truly, it is also impossible for opposites to belong simultaneously, unless either both belong in some way or one belongs in some way and the other belongs *simpliciter* (*haplôs*). (*Metaphysics Gamma*, 6, 1011b13-22)

The PNC, as the most certain opinion of all, implies that two contradictory assertions about the same thing cannot be simultaneously true: if an affirmation is true, its denial must be false, and conversely. Likewise, an affirmation and its denial cannot belong to the same thing: while an affirmation describes an actual thing (i.e. a composed

²⁰ For instance, Priest (2006, 2) writes: “The only major defence of the “Law of Non-Contradiction”—and so the only major critique of dialetheism—in the history of Western philosophy was given by Aristotle in book Γ of the *Metaphysics*. The defence is highly problematic. It is not clear what, exactly, his arguments are meant to establish, or how, exactly, they are meant to establish it... As we will see, none of the arguments in question succeeds in discrediting dialetheism.” Dialetheism asserts the truth of some contradictions. This is not the same as paraconsistency, which rejects the *ex falso quodlibet* of classical logic, i.e. the claim that, from two contradictory premises, anything follows. Cf. Priest (1998).

substance), its denial will account for the privation of this thing. Following Aristotle, privation (*sterêsis*) amounts to the denial of a definite genus. For instance, the true affirmation ‘man is a terrestrial, two-footed animal’ stands for the thought of an actual man, such that the definite genus ‘animal’ includes its differentiae ‘terrestrial’ and ‘two-footed’. On the other hand, the false denial ‘man is *not* a terrestrial, two-footed animal’ (i.e. ‘it is not the case that man is a terrestrial, two-footed animal’) stands for a privative thought, namely the denial of the definite genus ‘animal’ in relation to ‘terrestrial’ and ‘two-footed’. Therefore, if an affirmation pertains to an actual thing, its denial has to pertain to something other than this actual thing. The end of the above passage underlines how two opposite assertions may be simultaneously true, providing they are not in the same respect. We have seen that the affirmation ‘an acorn is an oak tree’ and its denial ‘an acorn is *not* an oak tree’ are simultaneously true, since they are not exact opposites: the oak tree belongs to an acorn in potentiality, while it does not belong to it in actuality. These opposite assertions are contraries, without being contradictories.

When Łukasiewicz asserts the logical formulation of the PNC, he quotes the first sentence of the above passage. As seen earlier, he writes: “Logical formulation: ‘The most certain of all [principles] is that contradictory sentences are not true at the same time’ (*Meta.* IV 6, 1011b13-14)”. Whereas Aristotle speaks of the PNC as the most certain opinion (*doxa*), Łukasiewicz reinterprets it as the most certain principle (*archê*). He neglects Aristotle’s claim that only philosophy, as the first science, understands the PNC as a necessary principle, meaning that the non-philosophers believe in this principle, without being able to cognize its necessity. From their standpoint, the PNC remains a common opinion, and Aristotle has to convince them that this opinion is true by providing the right justifications for it. Yet, the only way to understand the necessary truth of the PNC would be to become a philosopher. Therefore, to speak of the PNC through distinct formulations, as the followers of Łukasiewicz continue to do so, does not enable one to realize that Aristotle’s main concern lies in the defense of the philosophical PNC for those who have no access to philosophy.

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Wpłkxgt ulf cf g'f g'U q'Rc wq'WUR+

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