

Aristotle's Rationalism: A Reply to Barnes

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Abstract

Considering sensory perception and experience as kinds of knowledge, Aristotle is more concerned with these two than his predecessors. But although some of his commentators describe him as an empiricist, it seems that it is not precise to interpret him as such. In spite of this fact, would it be true to consider him a Rationalist? And if it is so, then in what sense and to what extent is he a Rationalist? In order to answer this question, I begin by considering constituent elements of Rationalism (and those of Empiricism) that is, innate ideas and intuition, and then I proceed with discussing Aristotle's stance on these elements, focusing on some of his works, particularly the last chapter of *Posterior Analytics*. Since there are different interpretations of this chapter, I have dealt with exegeses by commentators such as Jonathan Barnes and adapted some of their views that are related to my interpretative line in this article.

Keywords: Aristotle, Rationalism, Empiricism, innate idea, intuition, *Posterior Analytics*, Barnes.

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Introduction

I describe Aristotle to some degree a Rationalist. Since Rationalism and Empiricism are epistemological approaches appeared and extended in the modern period, it is barely possible to uncover the position of a philosopher belonging to an earlier period towards them. In fact, the main question is that in what sense Rationalism can be an attribute to Aristotle's philosophy. Moreover, given the blatant difference between Aristotle and his predecessors in assigning a central role to senses, what primarily occurs to mind is that he is an Empiricist, and that it would make no sense to relate his philosophy to Rationalism. However, in order to obtain a more detailed understanding about whether Aristotle's epistemological position is what it seems at first sight or not and whether it can be considered Rationalism or not, we should have a closer look at the dispute between two positions, for one thing, and at Aristotle's views in a variety of his works, for another.

Some commentators of Aristotle in recent decades, including Jonathan Barnes in his commentary on *Posterior Analytics*, characterized him as an Empiricist¹, and others, such as Frede (1996), regarded him as a Rationalist. However, some interpreters such as Ferejohn (2008) deemed arguments of the former group inadequate and rejected calling Aristotle a Rationalist. Instead, the latter maintain that Aristotle was silent on the matter. We need to assess arguments provided by these commentators about these claims.

The paper proceeds as follows: in the first section, I draw a brief sketch of two main elements of Rationalism, and the position of Empiricists on these two elements. This section will occupy a smaller portion of the paper. Then, in the second section, I consider Aristotle's views, specifically based on the last chapter of *Posterior Analytics*. I will, nonetheless, refer to some parts of Aristotle's *Metaphysics*, *De Anima* and *Nicomachean Ethics* in order to cast a further light on the main question of the paper. I will then examine and criticize the views and arguments of recent commentators of Aristotle who, in one way or another, support or reject my interpretation of Aristotle. Finally, I conclude with a short summary.

1. Rationalism and Its constituent elements

In response to the main epistemological question of how knowledge is acquired, Rationalists, notably Descartes,² have asserted that reason alone is capable of making judgments about the external world, and thus, acquiring knowledge of it. To do so, reason needs to be equipped with faculties and facilities. To put it another way, reason must first have certain ideas and concepts at its disposal, which are known as innate ideas, and then it needs to have the ability to establish relations among these ideas in such a way that no reference to anything external to, and beyond, reason is needed to justify these relations. These abilities consist in intuition and reasoning. Since, of these two abilities, it is intuition that is a matter of dispute, I restrict my inquiry in what follows to innate ideas and intuition.

There does not seem to be a dispute between a Rationalist and an Empiricist philosopher over the fact that some of our ideas are derived from senses and some others are constructed by the imaginative faculty. The dispute is indeed over the existence of a third type of ideas. According to Rationalists, there are at least some of our ideas that are neither derived from experience, nor constructed with the aid of imagination. In other words, we possess some ideas that cannot be created through senses, experiences, or imaginations. They are, indeed, innately possessed by our minds. In fact, Rationalists believe that nativism is the best explanation for the existence of such ideas. In contrast, Empiricists contend that, at birth, the human mind is a blank tablet void of any ideas. Ideas gradually enter the mind by means of senses. Thus, it is false to believe in innate ideas.³

For Rationalists, innate ideas have three characteristics: (1) they are real,⁴ that is, they are applicable to the external world, or alternatively, they stand for things out there, (2) they cannot be changed, added to, or eliminated from, and (3) they are universal, while sensory and imaginative ideas are not.⁵ In contrast, Locke and Hume, denying the existence of innate ideas, maintain that every and each idea in the mind must have been derived from senses. Moreover, the content of the acquired ideas should be similar to particular sensory ideas. Thus, radical empiricists have adopted nominalism concerning universals, taking them to be mere names that refer to numerous objects.⁶

An “intuition” is commonly defined as an immediate, non-inferential grasp of a concept or a proposition independent of sensory perception and imagination.⁷ The relation established here by reason among entities or concepts is likewise immediate, and due to this ability human mind can apprehend this relation. Empiricists deny intuition as an extraordinary intellectual capacity, or as an internal eye with which one can acquire knowledge of the external world.⁸

Thus, Rationalism can be said to have two main constituent elements: the reason’s capacity to serve as an origin of ideas that are not available to senses, and its ability to establish relations and to form /justify some acquired-via-intuition propositions that are both real and *a priori*. Both claims are denied by Empiricists. In what follows, I argue that Aristotle is a Rationalist in a particular sense.

2. Aristotle

The theory of innate knowledge dates back to Ancient Greek philosophy. According to Plato’s theory of *anamnesis* (ἀνάμνησις)⁹ or recollection, to know something is to recollect an acquaintance with it in the past life, before being coupled with one’s body in this world. In other words, it is the soul’s knowledge of truths it had previously grasped in the world of Forms. When incarnated or united with the body, the soul forgets these truths, and recollects them upon encounters with sensory objects. Here innateness amounts to being “inherent in the soul at the time of birth.” Since, for Aristotle, soul is the form of the body, it would be unlikely for it to exist prior to the body. Thus, Aristotle rejects Plato’s version of innate knowledge.

In his *De Anima*, Aristotle rejects innate ideas in ontological terms when he discusses intellect as a stage of the soul. For him, the intellect is solely a potential capacity at the time of birth and before the appearance of thinking. As he puts it, the intellect “can have no nature of its own, other than that of having a certain capacity”¹⁰ (429^a 21). Therefore, not only does it lack any *a priori* knowledge or conception, but “that in the soul which is called thought ...is, before it thinks, not actually any real thing” (429^a 23-4). Thus, based on his ontological approach, he rejects both Platonic and modern notions of innateness—the actual or potential existence of ideas.

Aristotle begins his *Posterior Analytic* with a well-known statement: “All teachings and all intellectual learning come about from already existing knowledge” (71^a1). At first, the statement sounds Platonic in its tone. However, focusing on phrases “teaching” and “learning” reveals that every science requires fundamentals and basics that are not inquired within that very science. Principles of a science are merely assumed in it in order to facilitate the teaching and learning of that specific science.

In chapter two of Book I of his *Posterior Analytics* (A2), concerning the nature of scientific knowledge (*episteme*) and its premises, Aristotle discusses understanding *simpliciter* and demonstration as means for acquisition of such knowledge. In order to have an understanding *simpliciter* of something one needs to know its explanation, which is only gained via demonstration. However, a demonstration requires premises that might, in their own right, depend on another demonstration. Since knowledge could not be acquired if there was an infinite regress of premises, the regress must end at some point, which Aristotle refers to as “primary principle”. In this chapter, Aristotle does not discuss premises of a demonstrative reasoning (71^b 17); he postpones it to another part of the book, that is, the last chapter of Book B of *Posterior Analytics*.

The most controversial part of Aristotle’s work concerning his epistemological standpoint refers to the last chapter of Book II of *Posterior Analytics* (henceforth B19). In this brief chapter, he poses questions that have given rise to different exegeses. In B19, Aristotle formulates the problem in terms of two questions: the first question is how primary principles are known, and the second one is about the mental state (*hexis*) by means of which we know these principles. He formulates the first question as follows: do mental states underlying the primary principles turn out to be produced in us, or did they already exist in us, in spite of the fact that they are remaining unnoticed? Here, as in the third book of *Metaphysics* (Book of “Beta”), Aristotle brings a problem up and develops arguments against both parties. He then suggests a third solution to the problem, which is, he claims, immune to objections that another two solutions may encounter. The bulk of B19 is devoted to his reply to the above-mentioned question. He proceeds by affording arguments against other alternatives.

Without explicitly mentioning Plato, Aristotle points out that our knowledge of these principles cannot be innate. the question is that how

can we have a knowledge that is “more precise than demonstration” (99^b 26), and yet at the same time we are unaware of it? The alternative to the innateness thesis is the “acquisition” thesis, but Aristotle rejects the latter too. For it faces another difficulty: since these principles are not innately known and since they are the primary premises of a demonstration, they cannot be reached at through demonstration. And given what Aristotle said elsewhere in *Posterior Analytics* that learning without pre-existing knowledge is impossible, it seems that these principles cannot be acquired either. Thus, the only way to know these principles is what Aristotle proposes.

To put it in a nutshell, Aristotle’s view is based on the idea that there are various stages of knowledge. Primary stages of knowledge cannot be taught or learned. Thus, no pre-existing knowledge is required in order to know them. Thus, primary principles can be known without facing the problem of pre-existing knowledge.

Just as in chapter 1 of *Metaphysics* Alpha,¹¹ Aristotle begins his discussion in B19 with sensory perception as being possessed by all animals. However, some animals only have impressions at the time of perception, without being able to retain their traces in their souls (99^b 35). Of animals in which impressions of sensory perception are retained, it may be said that they are in possession of memory and thus have a better type of knowledge.¹² In the next stage, accumulation of memories results in experience. What is retained in memory is numerically many, although it represents one and the same experience. The experience stays in mind independently of the many, and so it is universal¹³ (100^a 5-7). Although a universal is opposite of individuals, they both belong to the same kind. Here Aristotle draws on a battle-based analogy: consider a group of soldiers in a battle who rush about after an attack. Now if one soldier resists and is then joined by another soldier and then another soldier, and so on, then solidarity and order will be back to the army. He suggests that the act of retaining sensory impressions in the soul and the formation of general concepts are analogous to the mentioned instance. According to Frede, this analogy conveys that things begin with a temporary unstable grasp which could easily be lost, and end up with a persistent stable grasp. Frede suggests that concepts are acquired repeatedly until a consistent system is achieved (Frede, 1996: 170-1).

In his commentary on this part, Barnes¹⁴ remarks that there are four stages according to the majority of commentators, but he believes that there are only three stages involved: sense, memory, and experience. If there is another stage, that would be understanding, that is, causal explanation. In agreement with Barnes, the three stages are compatible with what Aristotle asserts in *Metaphysics* A.1. However, according to Barnes, some add a fourth stage, that is to say *logos* or definition. What *logos* or definition is and whether there is such a stage or not, are questions that need to be resolved. Before that, another point concerning Aristotle's position on the acquisition of general concepts should be discussed.

According to Aristotle, a general proposition or concept is acquired from individuals by means of induction. That is, general concepts are formed in one's mind inductively through individual ideas (100^b 4). In general, Aristotle believes that the following dichotomy is true: every teaching or learning is acquired either by way of syllogism (demonstration) or by way of induction (general concepts and premises of demonstrative reasoning).¹⁵ Thus, Aristotle's reply to the first question is that primary principles are inductively acquired through sensory knowledge.

For him, every sense perceives its own proper object. For example, vision only perceives colors, audition only perceives sounds, and so on. In connection with Aristotle's comments in B19, this indicates that if a particular color is repeatedly perceived by a sense, then its associated general concept will be. For example, after several times of seeing white color, a unique experience will result, and then the general concept of white will be acquired. And when concepts of different colors take form in the mind, the general concept of color will be attained, and afterwards the concept of sensory quality is gained, and at last, the concept of quality i.e. *summum genus*¹⁶ or a category. The same is true for other senses as well.

However, Aristotle's examples of *human* or *animal* (100^b 1) are not proper objects of senses; nor are they common objects of different senses (like shape and motion). Aristotle takes a human individual to be an accidental object of sense perception¹⁷ (418^a 21-22). It should be noted that these general concepts are not merely properties shared by many individuals, although the category of substance is acquired through individuals' repeated act of perceiving and through the general concept of humans and

then animals.¹⁸ In other words, in spite of the fact that all general concepts are inductively acquired, it is not the case that all of them can be premises of demonstrative arguments. These premises are characterized by a necessary relation between the subject and the predicate, where the latter determines the essence and the essential properties of the former,¹⁹ and these essential properties or predicates are attributed to the subject without mediation of any middle terms; this is the main characteristic of primary principles. Essential properties are those properties of an object that have a general and necessary connection with the concept of that object. These properties are not perceivable by senses. As Taylor puts it, senses cannot differentiate between necessary and possible truths (1990: 12).

The fourth stage is, in fact, a stage at which one can make a distinction between necessary and essential concepts of an object and other general concepts, and thus provide a *logos* or a definition of it. This stage was overlooked by Barnes, notwithstanding his insights that the human individual is an accidental object of perception and genus-based concepts is acquired through species-based concepts, up to the *summum genus* or the most general concept of all (Barnes 1975: 266).²⁰ However, since Barnes believes in three stages, taking induction to be the last stage of mental activity, he ends up characterizing Aristotle's account of general ideas in terms of empiricism.

Aristotle's answer to the second question he asked in B19 is indicative of acceptance of this fourth stage. In response to the nature of the mental state that knows the primary principles, he uses the term *nous*, commonly translated "intuitive reason."²¹ In Book VI of *Nicomachean Ethics*, Aristotle deals with *nous* while discussing the excellences of the intellect. For Aristotle, there are five excellences for intellect: art (*techne*), scientific knowledge (*episteme*), theoretical wisdom (*sophia*), practical wisdom (*phronesis*), and intuitive reason (*nous*) (1039^b14-17). This is not a classification of kinds of knowledge, because sensory perception is not included in the list, while Aristotle supposes it to be a kind of knowledge. This is, instead, a classification of excellences, or states of the intellect.²²

Some of these excellences are relevant to the theory and knowledge (*sophia* and *episteme*), and some are relevant to the course of action (*techne* and *phronesis*). However, *nous* can perceive things in both theoretical and

practical realms. In the realm of theoretical knowledge, Aristotle characterizes *nous* as an excellence to know primary principles that cannot be grasped by other intellectual excellences²³ (1141^a 8), emphasizing again that induction in this case generates something general. It is noteworthy that Aristotle places *nous* above mathematics, because boys or young men can easily learn mathematics, while they cannot easily become “wise men or natural scientists”²⁴, “because young men have no conviction about the latter but merely use the proper language, while the essence of mathematical objects is plain enough to them” (1142^a15-20). In other words, general concepts and propositions such as those employed in mathematics can be acquired by the young, but knowledge of the principles of the natural science and practical wisdom requires making use of *nous*, which takes considerable time to be developed in the young. If the fourth stage were not there, these principles could be acquired along with general mathematical concepts. Aristotle believes that age is limited and this is the only opportunity to which develop intuitive reason. Thus, it seems that Aristotle does not rest content with the three stages: the intuitive reason [*nous*] pertains to the highest concepts about which no reasoning is possible (1142^a 24). He also sees *nous* analogous to the eye (1143^b 14) with which things can be seen properly.²⁵

This shows that *nous* is an intellectual capacity which appears as a potentiality and is *acquired* over time. Moreover, the capacity enables one to not only perceive proper objects of sensory perception such as color and taste, but also the forms of objects and thus distinguish their essential properties. According to Aristotle there is no such a role for *nous* to perceive similarities among objects or to construct general concepts taken from induction. To perceive similarities and to construct general concepts is not precisely what young men achieve with difficulty. For concepts such as triangle, line, and number are general concepts acquired via induction. What is difficult for young men is to make distinction between the essential properties of objects from accidental ones. Thus, *nous* enables us to intuit general concepts as well as universal and necessary relations among concepts. This relation is grasped intuitively because it is grasped without any middle terms. Thus, to translate *nous* into intuitive reason seems more accurate. Now, given the role Aristotle determines for reason and intuition, he can be deemed a Rationalist of some sort.

However, Barnes believes that *nous* should not be translated into intuitive reason. In B19, *nous* is a kind of sensory perception, not an intellectual insight. He argues that Aristotle has posed two questions, which are independently answered. In response to the first question he appeals to induction, rather than *nous*. According to Barnes, Aristotle does not appeal to *nous* as to how knowledge is acquired. Instead, he takes it to be a mental state in us. Thus, Barnes wants to point out that *hexis* is a mental state and not a mental faculty²⁶. Of course, he refers to passages from *Nicomachean Ethics* and maintains that it contradicts his conclusion. However, he does not take it too serious, because for him B19 has a stronger structure than “an argument culled from aside in *EN* [i.e. *Nicomachean Ethics*]” (Barnes 1975: 269). Thus, instead of translating *nous* into intuitive reason, he chooses the more neutral term “comprehension” (ibid: 268). Barnes has led to such a conclusion because, on the one hand, he has neglected the nature of *nous* as an excellence of intellect, and on the other hand, he has failed to notice the relation between primary principles and general concepts.

Ferejohn also criticizes Barnes’s conclusion that Aristotle was “wholeheartedly empiricist” (Barnes 1975: 270) noting that one can hardly find an argument for this claim in Barnes’s commentary (Ferejohn 2008: 70). In fact, Barnes does not provide us with any formulation of Empiricism according to which Aristotle counts as a wholeheartedly Empiricist. Barnes seems to hold that Empiricism amounts to the idea that experience is the starting point of knowledge acquisition. Ferejohn evaluates Barnes’s claim²⁷ and concludes that there is no adequate reason to consider Aristotle as an Empiricist. However, Ferejohn believes that Aristotle leaves his position unexplained: “In other words, it is quite possible that at that point in his thinking, he was convinced – perhaps by his own argument in II.19 – that humans, *qua* rational, must possess a very special cognitive faculty which allows for the grasp of the ultimate explanatory principles, but had not the slightest idea of what exactly this faculty is, or how it could perform this function” (Ferejohn 2008:80)

However, Frede interpret Aristotle as a rationalist to a certain extent. To demonstrate this, he does not refer to *Nicomachean Ethics*. Instead, he characterizes the stages of knowledge as they emerge in B19 and *Metaphysics* A.1 and concludes that potential reason is the faculty that

perceptually discriminates and remembers and then gradually acquires the concepts. Thus, the potential reason turns into an actual reason. The acquisition of reason is a natural process (causally) aided by perception, although it is not justified by experience (Frede 1996: 169-171). The reason is a “highly specific ability to grasp certain features and necessary relations between them”. Aristotle’s predecessors overlooked this ability or failed to recognize it as a separate ability (Frede 1996: 165). Frede warns that, for Aristotle, reason is a common ability, rather than “a mysterious quasi-mystical power of the mind to intuit universals” (ibid: 167). Frede does not interpret *nous* merely as a mental state; he also regards it as a mental ability. This interpretation of *nous* is compatible with the above-mentioned parts of *Nicomachean Ethics*, although they are not cited by Frede. Such an ability is acquired over time and enables us to grasp primary principles, that is, the essence and the essential properties of objects which are necessarily interrelated. It seems that if it is true that the ability is equally shared by everyone, it does not mean that it is equally actualized in everyone and thus, one cannot talk of equality with respect to intuitive reason for everyone.

Thus, contrary to Barnes’s claim (1975: 271), *Posterior Analytics* has one and the same subject-matter. Barnes believes that chapters 3 to 18 of the Book II are discussing the relation between the essence and demonstrative reasoning, and all of a sudden the subject-matter changes in chapter 19. However, according to my account, chapter 19 is linked with the discussions in previous chapters and is concerned with knowledge of essence and essential properties and the mental ability for such knowledge.

3. Conclusion

I have argued in this paper that the interpretation in which Aristotle is deemed an Empiricist is not convincing. However, the sort of Rationalism that can be attributed to Aristotle is basically different from that of the modern period and that of Plato. Aristotle does not subscribe to the idea that reason alone can know the world. And contrary to modern Rationalists, Aristotle denies that general concepts have no origin in our senses or they are not enabled by them. He concludes that reason has grasp of the essence and the essential properties of objects, that is, forms of

objects, via experience. Thus, reason can bring the form under a general and intelligible concept. Thus, instead of admitting that ideas exist potentially or actually in the mind, Aristotle believes that there exists a potential intellectual power to produce ideas, which is actualized gradually. Moreover, Aristotle's intuition is different from the pure rational intuition of typical Rationalists.

If we take radical Empiricism into consideration, then Aristotle would not count as an Empiricist because he believed in general concepts (as I pointed out at the beginning of the paper). That is, a radical Empiricist believes that the content of sensory perceptions is particular and every idea that is formed in the mind should be particular too. However, as we have seen, although he is an Empiricist, Barnes does not advocate such an unsupported claim. This is why I did not appeal to Aristotle's belief in general concepts to argue for his Rationalism.

It remains to point out that Aristotle does not grapple with how primary intelligibles or quidditative general concepts are acquired, due to epistemological motives. Instead, he has ontological motivations to deal with this problem. That is, he is concerned with necessary and universal truths about the external world that can be known without demonstrative arguments. However, Aristotle remains silent about secondary intelligibles. Of the latter intelligibles, he did not deal at all with ontological concepts of existence and nonexistence; neither was he concerned with how concepts such as cause and effect, potentiality and actuality, unity and plurality, and the like are produced. Perhaps if he was concerned with how these concepts are produced, he would have made *nous* responsible to do it or find a new ability for the production of these concepts. For, as pointed out before, they cannot have sensory or imaginative (memory-based) forms and thus they cannot be acquired via induction. This has been neglected by Aristotle.

Endnotes

1. Although Empiricism was present in one way or another in Ancient Greece, what Barnes has in mind, and is indeed intended in this paper, is its modern, rather than the ancient, notion. As to its ancient notion, see the following entry: Gregory W. Dawes, "Ancient and Medieval Empiricism" in *Stanford Encyclopedia of Philosophy* (winter 2017 edition).
2. See Descartes, CSM 1,143-4, 303-4, CSM 2, 26,35, 63 ,CSM 3,222 and Hoshyar 2009: 177-180.
3. Locke maintains that the mind is, at birth, a *tabula rasa* devoid of any ideas. Ideas are gradually inscribed on the mind via senses. Thus, there are no innate ideas. In Book I of *An Essay Concerning Human Understanding*, Locke rejects arguments supporting the existence of innate ideas. However, the argument he attributes to rationalists is not the one afforded by philosophers such as Descartes; it was suggested by Lord Herbert of Cherbury. Thus, Locke's anti-innate argument does not totally reject innate ideas; it only rejects a certain version of it. Here I do not grapple with Lord Herbert's argument and Locke's response to it (for more discussion, see Hoshyar 2009: 180-182). In Book II of his *Essays*, however, Locke argues against rationalists on the basis of a methodological principle. Therefore, innate ideas should be set aside in accordance with Ockham's methodological principle. Empiricists did not rest content with this. Hume goes beyond to say that every idea is ultimately originated in sensory perception. This also serves as a test for the existence of ideas in the mind. That is to say, if we fail to trace a term back to experience, then the term turns out not to exist at all—that it is an empty term. (*An Enquiry Concerning Human Understanding*, Section 2, 9, SNB 22.)
4. See Hoshyar 2009: 187-193.
5. See Hoshyar 2009: 193-201. This characteristic has been only implicitly referred to by rationalists, perhaps because they did not want to engage in medieval controversies over universals. Universal ideas to which rationalists refer include mathematical ideas, substance, body, God, and the like. However, ideas derived from senses may as well have a universal form, such as the ideas of a cat, horse, and other natural species. These ideas, referred to in Islamic philosophy as quidditative concepts, have not been canonical for rationalists.
6. Berkeley, *A Treatise Concerning the Principles of Human Knowledge*: XI and XII.
7. Descartes, CSM, 1:14. For rationalists who take knowledge, and its prime example i.e. mathematics to have an axiomatic structure, the intuition plays a significant role in understanding and specifying the basic propositions of the system. Other propositions can be deduced from these basic propositions by means of syllogisms and reasoning. Thus, a solid epistemic system is formed on the basis of reason, which can be applied to the external world.
8. Empiricists such as Hume take mathematics to consist in relations between ideas. For them, a mathematical proposition is merely a relation between ideas and has nothing to do with the real world. Mathematical propositions are either

definitions or propositions that have been deduced from definitions, and the ones that do not yield any knowledge of the external world. Thus, Hume does not take mathematics to be real knowledge. Thus, contrary to Rationalists, establishing mathematical relations does not count as a peculiar intellectual capacity.

9. *Meno*,80a- 86c

10. Hence, the intellect which does not actually exist is not capable of having ideas which potentially exist. *Meno*,80a- 86c

11. Book I of *Metaphysics* begins with “All men by nature desire to know.” (980a 22). He considers sense to be the first stage of knowledge shared by humans and animals. Some animals possess memory, in addition to senses. The better the memory of an animal is, the more knowledge it will acquire. Some animals can even be trained. However, non-human animals deal with appearances (or impressions) and memories at the highest level of their perception, and they have a small share of experience (980b 7-26). However, in human beings memory results in experience (*emperia*): “And experience seems pretty much like science (*episteme*) and art (*techne*), but real science and art come to men through experience” (981a 1-2). However, experience is different from science and art. Experience is the knowledge of individuals, and art is the knowledge of universals (981a 16). By “universals” he does not merely mean general propositions; he also has general concepts in mind. Thus, Aristotle needs to give an account of how universal knowledge is formed.

12. Michael Ferejohn (2008: 69) articulates Aristotle’s view concerning animals enjoyment of memory as follows: they perceive two instances of a same kind, without understanding that they are of a same kind. Thus, they lack experience.

13. Bronstein believes that according to Aristotle, a “universal” is not a general concept, but a proposition such as “All As are B.” is a universal one (Bronstein, 2016: 236.)

14. Barnes is both the editor of *The Complete Works of Aristotle* and the commentator of *Posterior Analytics*.

15. He points out the dichotomy in some of his works: *Nicomachean Ethics* 28b 1139 and *Posterior Analytics* I.18, 36a 81).

16. This is a Porphyrian terminology; see Porphyry *Isagoge – Mediaeval Sources in Translation* 16, E. Warren, trans. (Toronto: Pontifical Institute of Mediaeval Studies, 1975).

17. A difference between proper and accidental objects of perception is that errors are impossible in the former. For example, no error can occur in the color itself—errors only occur about its nature and location (418^a 12-16). However, errors are possible in accidental objects of perception. According to Frede (1996: 168), there is no guarantee that errors do not happen here.

18. Bornstein considers what individuals have in common, on one hand, and gives the example of having a pair of feet, on the other. Finally, at the end of the paragraph, he emphasizes on the essence and nature of objects (Bronstein,2016:247)

19. This is relevant to the problem of “forms” in Aristotle: see Hoshyar 2018.
20. He, nonetheless, refers to this way of acquiring more general concepts as “abstraction.”
21. Ross (1949: 675) translates *nous* into intuitive reason. However, Barnes translates it as “comprehension” (1975: 74). In what follows we will see the reason for Barnes’s choice.
22. Aristotle applies the above notions to the outcomes of these mental states. Knowledge is a mental state, as it is the outcome of a mental state. Moreover, he characterizes these excellences in terms of truth. Thus, he does not take opinion to be an excellence of intellect, because it might be false.
23. Aristotle argues that *episteme* fails to know primary principles, because it can only demonstrate. Art and wisdom also fail because of their practical nature. Theoretical wisdom also fails, because it is a combination of *nous* and *episteme* (1141^a 18-19).
24. Before this, Aristotle talks about practical wisdom, and so “wise men” might refer to men of practical wisdom. However, natural philosophy has nothing to do with human actions—it is associated with the theoretical function of *nous*.
25. Aristotle has made the analogy concerning intuitive reason (*nous*) with respect to practical matters. What is important, however, is that he analogizes *nous* to the eye.
26. Bronstein makes a similar assumption (Bronstein, 2016: 236).
27. Ferejohn also discusses two other papers:
- Leshner, J. (1973) "The Meaning of *Nous* in Posterior Analytics", *Phronesis*, 18, pp. 44-68.
 - Kosman L.A. (1973). "Understanding, Explanation and Insight in Aristotle's Posterior Analytics", in E. Lee, A. Mourelatos and R.Rorty (eds), *Exegesis and Argument* (Assen: Van Gorcum), pp. 374-92.

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