On how we acquire knowledge of first principles (archai) in Aristotle

A defense of intuition (nous) understood as integral to induction (epagoge)

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List of abbreviations and translations used for Aristotle’s works

I cite Aristotle’s works by title, Roman book letter, chapter number and then page, column, and line in Bekker’s edition (e.g. *APo*. II.19, 100b5). I use the following abbreviations and the following translations unless otherwise noted:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Latin</th>
<th>English translation</th>
<th>Translator</th>
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<tr>
<td><em>APo</em></td>
<td><em>Analytica Posteriora</em></td>
<td>Posterior Analytics</td>
<td>Barnes (1993)</td>
</tr>
<tr>
<td><em>DA</em></td>
<td><em>De Anima</em></td>
<td>On the Soul</td>
<td>Hamlyn (1993)</td>
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<td><em>Met</em></td>
<td><em>Metaphysica</em></td>
<td>Metaphysics</td>
<td>Ross (1984)</td>
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<td><em>EN</em></td>
<td><em>Ethica Nichomachea</em></td>
<td>Nichomachean Ethics</td>
<td>Ross (1984)</td>
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Glossary of technical terms

<table>
<thead>
<tr>
<th>Greek</th>
<th>English</th>
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<tr>
<td>aesthesis</td>
<td>perception, but also: sensation</td>
</tr>
<tr>
<td>archai</td>
<td>first principles, beginnings, starting points</td>
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<tr>
<td>epagoge</td>
<td>induction</td>
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<tr>
<td>episteme</td>
<td>knowledge as in theoretical or scientific knowledge</td>
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<tr>
<td>logos</td>
<td>account, argument, but also: reason</td>
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<tr>
<td>hexis</td>
<td>state, disposition, but also: function</td>
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<tr>
<td>nous</td>
<td>intellect, intuition, comprehension, reason</td>
</tr>
<tr>
<td>phronesis</td>
<td>practical knowledge, practical virtue, implies both good judgment and excellence or character</td>
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<tr>
<td>sophia</td>
<td>wisdom, or: theoretical wisdom.</td>
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<tr>
<td>syllogism</td>
<td>deduction, deductive argument</td>
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It is difficult to know whether you know something or not. For it is difficult to know whether or not our knowledge of something proceeds from its principles - and this is what it is to know something. – Posterior Analytics 1.9

1. Introduction

Aristotle’s account of how induction (epagoge) leads us to knowledge of what he calls the first principles (archai) is ultimately based in our capacity for perception on the one hand but on the other hand it is described as being comprehended by nous, (variously translated as e.g. intuition, intellection or comprehension). This two-part answer has traditionally presented interpretative challenges to commentators. Additional contributing factors to these interpretative difficulties include that the relevant passages on the topic are mostly rather short, spread out throughout the Aristotelian corpus and are generally tersely written – often rendering the correct interpretation debatable. Opinions by commentators have varied as widely as to take Aristotle’s account of knowledge acquisition as either: empiricist, rationalist, or some crossover version of the two – or even just as inherently inconsistent between the two positions. The aim of this essay will not be to try and weigh in on this debate directly but to focus on a particular question central to this discussion: whether nous (intellection) is part of epagoge (induction) leading to a grasp of the first principles or only enters the equation as the state or disposition of knowing which ensues from a successful induction.¹

The empiricist interpreters of Aristotle’s epistemology generally believe that nous (intellection) is absent as a mode of discovery from the account of knowledge acquisition. Instead, by their logic the correct view would be that nous only ensues as the state which follows upon an induction starting from perception. On this view, perception, simply coupled with induction is understood to be powerful enough to attain knowledge of first principles – rendering an addition of something like the active involvement of intuition in the process

¹ This is a problem that others have treated in the literature, for example Barnes (1993) and on this Irwin says, "It is not clear whether the nous is part of induction or the state we have reached when we have finished the induction" (1988, p. 531).
redundant. Aristotle’s version of induction on this account would then be close to the common conception of induction as a process which generalizes from a set of particularities and then extrapolates the universal conclusion to the complete set of particulars.

In opposition to this, I will defend the view that knowledge acquisition in Aristotle must and does include nous as an active component involved in the grasping of first principles. I argue, this becomes clear in the light of Aristotle’s overall philosophy of knowledge acquisition, because it distinguishes qualitatively between forms of knowing that are due to mere experience and those that involve an intellectual grasp of things. Furthermore, I argue that it is essential to view Aristotle’s account of knowledge acquisition in relation to what he understands the objects of intellectual knowing to be. This perspective makes it clear that the first principles of Aristotle’s philosophy in one sense function as axioms, definitions and hypotheses in his scientific thinking, while in parallel figuring as metaphysical features fundamental to the nature of reality. Because the mind is able to grasp them as being both Aristotle’s account of induction should be understood as a form of intuitive-induction. That this process involves a notion of intuitiveness or mental insight is what accounts for the possibility of grasping the first principles as scientific as well as essential features of the natural world.

The structure of the essay will be as follows. First, I will introduce readers unfamiliar with the context of the question under discussion to the topic at hand. Then I will give my interpretation of the key passages and show how my thesis follows from these. For simplicity’s sake, these passages are mainly taken from APo II.19 and Met I.1. The first group of these passages is generally regarded as the definitive account Aristotle gives of induction, they are all from the last chapter of the Posterior Analytics, Aristotle’s treatise on scientific or theoretical knowledge (as opposed to practical knowledge which is dealt with in the ethics.). And the second group offers a striking parallel account to the former one while offering, in my view, a bit more nuance and explication when it comes to the question of what is actually concerned when speaking of the process of induction to first principles.
2. A point of entry and how to understand first principles (archai)

The syllogism², is the definitive paradigm of Aristotle’s logic and renders what he calls episteme (e.g. translated as scientific or theoretical knowledge). Aristotle’s notion of scientific or theoretical knowledge (episteme) is quite close to what we today understand by deductive knowledge. By deductive knowledge I mean knowledge which is gathered by the process of reasoning from one or more statements (premises) to reach a logically valid conclusion. Aristotle also recognizes another form of knowledge which translates well as practical knowledge (phronesis). This type of knowledge is gathered exclusively through experience and does not yield conceptual knowledge by itself. To avoid any confusion, I want to make clear I will be concerned only with conceptual knowledge considered unto itself in this essay. Aristotle’s discussion of practical knowledge (phronesis) will therefore be left entirely outside of this discussion. In syllogistic logic all demonstration is said to be done through a middle term occurring both in the major and minor premise of an argument but not in the conclusion. For example:

P1  All men are mortal
P2  Socrates is a man
C   Socrates is mortal

The above is a valid and sound syllogism. Meaning, the conclusion follows logically from its premises and the premises are true. In this example we can know this inference to be true, if and only if, we know for a fact that Socrates is a man and that all men are in fact mortal. These facts we come to know through the process of induction (epagoge).

A common interjection made at this point by epistemological sceptics is the concern that a deduction of this sort does not or can never amount to robust knowledge because the inductive inference it depends upon isn’t any good. For example, the inference could simply rest on a

² On this, Lear says: “some syllogisms are not easily conceived of as deductions” (1988, p. 210).
generalization from a limited and therefore insufficient sample size. As we haven’t observed all instances of men, we cannot be certain that they are all mortal. This example falls under one of the two main variants of what is also known as the problem of induction, in its classic formulation due to David Hume (1711-76). He argued that the validity of all inductive inference relies on the unfounded assumption that there should be a necessary connection between past and future. Instead, Hume argues: “every effect is a distinct event from its cause. It could not, therefore, be discovered in the cause, and the first invention or conception of it, a priori, must be entirely arbitrary” (2000, iv:25). Hume draws the conclusion that reason has no part to play in the inductive process, he thinks it is based entirely on experience.

This is manifestly not Aristotle’s view. What Aristotle has in common with the humean view is that induction (epagoge) is also based on experience. But his, is a notion of intuitive-induction which includes our faculty of reason (nous) also being involved in this process. To Aristotle the world can be understood on a conceptual level, precisely because the mind and the world are of like nature. In the domain of epistemology this perspective leads him to the belief that there must be indemonstrable first principles (archai) which support all of our deductive knowledge. Aristotle reasons the alternatives are either circular justification or an infinite regress of justification. He thinks we should reject circular proof on the basis that anything becomes easy to demonstrate circularly and is therefore trivial. And about infinite regress, Aristotle says, if the first principles themselves were to rely on further premises, and so forth, we would never be able to demonstrate anything. Therefore, he concludes there must be indemonstrable understanding of the first principles (archai). However, note that indemonstrable in this sense means, syllogistically indemonstrable. That is to say: understanding which cannot be demonstrated through a syllogism. Aristotle still allows such principles to be demonstrated in the negative or otherwise shown to hold true, for example through support from perception.

We assert that not all understanding is demonstrative: rather, in the case of immediate items understanding is indemonstrable. And it is clear that this must be so; for if you must understand the items which are prior and from which the demonstration proceeds, and if things come to a stop at some point, then these immediates must be indemonstrable. (APo, II.19, 72b19-24).

Much hangs upon this notion of prior, immediate and indemonstrable principles. It is quite a mouthful, but all predicates ascribed to the first principles hang together in a mutually co-dependent way. If a proposition would lack any of these, it would lack all, for a something
which isn’t immediate cannot be prior and isn’t indemonstrable either and something not prior isn’t indemonstrable and not immediate and something which isn’t indemonstrable isn’t prior nor immediate. What it means for a principle to be indemonstrable in terms of syllogistic logic is that it doesn’t conform to the deductive character of the syllogistic form and bears up the deductive inferences by being prior to these, immediate onto themselves and (deductively) indemonstrable. So far, we have considered Aristotle’s notion of first principles (archai) in so far as they are the starting points for demonstrative knowledge, summing this up simply: “there are principles [archai] of everything that is demonstrated and of all knowledge [episteme] (for knowledge [episteme] involves reasoning)” (EN. VI.6, 1140b31-23).

Thus considered, these first principles (archai) can be axioms, definitions or hypothesis. But importantly, first principles are not exclusively epistemological terms. As I have noted before, for Aristotle nature and mind are alike. This reflects in his theory of knowledge in the sense that his notion of first principles (archai) covers both the epistemological as well as the metaphysical. Terence Irwin has put this point in the following way: “The first principles we find will include beliefs and propositions. But Aristotle also regards things—non-linguistic, non-psychological, non-propositional entities—as first principles.” (1988, p. 4). Used in the latter sense, we may refer to them as metaphysical entities. For example, Aristotle says: “God is thought to be among the causes of all things and to be a first principle” (Met. I.2, 983a9) and “[t]he soul is the cause and first principle of the living body” (DA. II.4, 415b12). It is clear from such statements, then, that apart from thinking of the first principles as the starting points for demonstrations, Aristotle clearly also thinks of them in a metaphysical sense in which they can be said to support modes of being – e.g. in the way that God is thought to support the structure of the world and the soul is the inner principle of the body.

3. The case of Posterior Analytics II.19 and the empiricist account of induction (epagoge)

In this section I will introduce an interlocutor which represents a view I have identified for criticism and contrast with mine. I briefly discuss some of my positions in relation to this view in order to create a vantage point for the discussion of this paper.
Among others, Jonathan Barnes has argued for an empiricist account of Aristotle’s theory of how we acquire knowledge of first principles. It seems proponents of this view often predominantly rely on an empiricist interpretation of the last chapter of the *Posterior Analytics*. Which is understandable from the perspective that it is the only place in *APo* where Aristotle directly addresses the problem of how the first principles are known. On the other hand however, as I will discuss in more depth shortly, *APo* II.19 is notoriously terse and consequently proportionally difficult to interpret.

A common conception among these empiricist readings and which Barnes represents is that ‘“intuition [*nous*] as a mode of discovery is absent from the [*Posterior Analytics*]’’*(1993, p. 270). The first principles then, supposedly, are grasped through perception and ‘experiential-induction’ alone*. As far as I can tell however, the text is at the most inconclusive on the question whether *nous* is actively involved in induction or only a result of the process. Charitably put, and presupposing common translation, nothing in the text either strongly seems to impose or oppose either of the two possible readings. As far as the chapter goes, taken in isolation, it does seem how one reads the text is down to interpretation.

In fact, in the entire *Posterior Analytics* Aristotle’s use of the word *nous* is very scarce. Apart from two brief remarks, one at: I.33, 85a1 and one at: I.33, 88b36, both stating *nous* is a principle of understanding, II.19 is the only chapter that discusses *nous*. Given all this, a definitive answer as to whether *nous* plays an active role in the acquisition of knowledge isn’t very likely to come from *APo*, perhaps, disappointingly so, since, it is the main treatise dealing with how we acquire knowledge in Aristotle. Possibly however, Aristotle isn’t concerned with providing a complete picture of the process of acquisition of the first principles in chapter II.19. Charles Bronstein has argued that contrary to common perception Aristotle isn’t trying to show how we come all the way from perception to the first principles in *APo* II.19. Rather, on this view, he only defends the claim that our knowledge of first principles originates in perception *(2012, p. 29). What doesn’t square up with this account seems to be the function and placement of the last paragraph of II.19. Which – although written tersely – directly deals with the question of *nous* and its involvement in the grasping of the first principles (*archai*). Furthermore, Contrary to what Bronstein claims, Aristotle, as we will see, does explicitly

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3 I use the term ‘experiential’ induction here to refer to what I will call the humean notion of induction, which is based on mere experience and void of any involvement of intuition, reason or to use the Greek correlative: *nous*. Adding the predicate ‘experiential’ is solely done to indicate this view is meant and to demarcate it from the intuitive-induction that I ascribe to Aristotle.
explain how the principles become known, namely ‘‘from all the universal which has come to rest in the soul . . . there comes a principle of skill or of understanding’’ (APo II.19, 100a6-7).

Barnes, however, proposes that a correct view of APo II.19 hinges upon making the distinction between the two central questions of the chapter. In his view these are:

(1) ‘‘Do we have innate knowledge of the principles, or is our knowledge acquired? And if it is acquired, how is it acquired?’’ (1993, p. 261)

and

(2) ‘‘What is the state, or hexis, that grasps the principles?’’ (p. 267).

On his view: “the answer Aristotle gives to the first question is whole-heartedly empiricist’’ (p. 270). Meaning, we do not have innate knowledge of the principles and we come to know them simply through perception and induction. Barnes does not define what he means by induction in his text, although it is clear from his further treatment of Aristotle’s account of acquisition of first principles (archai) that he attributes to Aristotle a similar notion of induction as that which I have called ‘‘experiential’’-induction. It excludes intuition or mental insight.

4. The genealogy of the process of induction (epagoge): from perception to intellection

In this section I relay Aristotle’s genealogy of the process of induction and enter into a dialogue with the empiricist reading such as Barnes defends. I first treat perception and experience onto themselves and ask if the yield knowledge of their own, and if so what kind. Then I question whether thinking as an active element of induction enters the picture without us realizing it. This element of thought entering the realm of induction, then leads to the proposal of understanding Aristotle’s form of induction as an intuitive type of induction.

As far as perception (aisthesis) considered in relation to the first principles directly Aristotle says

… we do not regard any of the senses as wisdom; yet surely these give the most authoritative knowledge of particulars. But they do not tell us the ‘‘why’’ of anything- e.g. why fire is hot; they only say that it is hot’’ (Met. I.1. 981b10-12).
Clearly, Aristotle does conceive of perception as playing a prominent role in as much as it assists us in becoming able to contemplate things. Furthermore, it gives us a certain sort of knowledge – knowledge of particulars, but wisdom and knowing the ‘why’ is supposed to require something more. Note that Aristotle recognizes various forms of knowledge. In order to grasp principles (archai) or even attain wisdom we need to know the ‘why’ of things, in other words we need to become familiar with their universal features. So, if perception alone isn’t enough, does perception plus memory and experience suffice to get us to the universals? It seems this should be the case, if empiricist views like that of Jonathan Barnes are correct. Although Barnes doesn’t specify in his article what exactly he means by the ‘honest empiricist way’ of grasping the principles he endorses, he seems simply to be suggesting a view that signifies by induction a mode of discovery that makes use of perception, a powerful sense of memory and experience and treats thinking as separate from this process, only entering the picture in the form of an understanding once it has received its subject matter from experience. Barnes seems to derive this view mainly based of the following passage.

Thus, from perception there comes memory, as we call it, and from memory (when it occurs often in connection with the same item) experience; for memories which are many in number form a single experience. And from experience, or from all the universal which has come to rest in the soul (the one apart from the many, i.e. whatever is one and the same in all these items), there comes a principle of skill or of understanding – of skill if it deals with how things come about, of understanding if it deals with how things are (APo. II.19 100a3-9).

From this passage we should be safely able to assume that mere experience already instills universals. However, we should take note that, this does not yet entail we have true knowledge. Yet another step takes place after this which results in a principle of skill or understanding. The principle needed for this only comes about once ‘all the universal has come to rest in the soul’. Aristotle soon starts to clarify what this means in what follows in the next passage and does this by way of a simile.

. . .[T]hey [the states in which we know the principles] come about from perception – as in a battle, when a rout has occurred, first one man makes a stand, then another does, and then another, until a position of strength is reached. And the soul is capable of undergoing this (APo II.19, 100a10-16).

Apart from a more detailed picture being sketched of how the universal successively becomes more familiar to the soul through successive encounters with it, it doesn’t seem like too much
else terribly new is being said here. If we’d simply left our reasoning here, it would look a lot like as if the principles become known through perception and induction and that that’s that – without any mention being made of nous (intuition or mind) playing an active role in the process we have accounted for how the first principles become known. This is the position for example Barnes takes. However, I do think we ought to pay special attention to one more detail, namely that it is the soul which is capable of undergoing this process of induction. In the De Anima, Aristotle’s main treatise on the soul, we find a passage that gives a matching account but this time of the intellect (nous) receiving the forms into itself.

Now, if thinking is akin to perceiving, it would be either being affected in some way by the object of thought or something else of this kind. It must then be unaffected [by matter], but capable of receiving the form [instantiated in the matter], and potentially [be] such as it, although not identical with it; and as that which is capable of perceiving is to the objects of perception, so must be the intellect similarly to its objects. (DA III.4, 429a13-17)

The question on the table then is whether the account from APo II.19 and that from DA III.4 describe the same process viewed from different points of view or different processes altogether. While, although in APo II.19 a process induction through perception and experience is being described, and in DA III.4 a process of the intellect ‘receiving the form’ into itself, it seems plausible that Aristotle is speaking of §12 in both cases: the acquisition of first principles, only regarded from different view-points. Because the same things which are forms regarded in another way are also principles. For example, as Aristotle mentions: “the soul is the cause and first principle of the living body” (DA. II.4, 415b8). As being a cause and first principle of the living body, it is so in the three different ways that the form is spoken of as cause: “as being that from which the movement is itself derived, as that for the sake of which it occurs, and as the essence of bodies which are ensouled” (ibid. b11-13). Someone who has already endorsed a similar viewpoint is Jonathan Lear, in “Aristotle: The Desire to understand” he writes:

. . . one would expect Aristotle to identify the why with a thing’s nature. For the form which is the thing’s inner principle of change, provides us with the best understanding of what the thing most truly is and why it is the way it is. This expectation is, I believe realized: Aristotle did identify the why with an object’s nature or form.” (1988, p.27)

If the view Lear and I endorse is correct, we can see how Aristotle’s epistemological notion of ‘the why’ and the metaphysical notion of form begin to melt into one. It should be a plausible
argument then that: if thinking grasps the forms and these are also being described as first principles that thinking would also be involved in the process of induction, thus rendering the inductive process an intuitive induction process. This would fit with Aristotle’s deep commitment to our ability to comprehend the principles as such, even without perfect information of the particulars, because the universal is instantiated in the particular and the mind is capable of lifting it back out, so to speak, and behold it onto itself. Abstraction and/or generalization is possible on the basis of grasping the universal principles as they are instantiated in the particular. We perceive the particular but perception is of the universal.

But if this is so, why then does Aristotle not explicate the active involvement of nous in II.19, concerning this question it should be noted that the hylomorphic perspective on principles is entirely absent from the Posterior Analytics in general. While, as I hope to have shown, the latter view (presented in De Anima) can be taken to expand the description of the process given in APo II.19, if we are to give priority to the view Barnes espouses, we are left with the difficulty of explaining why Aristotle in one place apparently finds a powerful notion of experience sufficient to bring us to the first principles, while in another a form of intuitive thinking is clearly said to be instrumental to comprehend the forms, which, as we have seen we reasonably ought to take as closely related if not synonymous to the first principles, at least in some way – as both state indemonstrable truths about fundamental aspects of reality.

5. The object of first principles and the corresponding capacity of the soul

In this section I use the concept of soul to exemplify how the first principles take on a metaphysical form when perceived as those aspects of things which give them (part of) their essence or form. Then I move on to the question of: in virtue of what capacity the soul is able to perceive these principles, essences and forms.

The debate about the defensibility of Aristotle’s concept of soul being as it may, the soul undeniably plays a fundamental role for Aristotle’s overall metaphysics and therefore also for

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4 Hylomorphism: Aristotle’s theory of matter and form including the four ways in which cause is spoken of. See for example Jonathan Lear succinct and elucidating account of it: “The matter provides the brute particularity of an object: it can be perceived but not understood... The so-called formal, efficient, and final causes... three different aspects of form itself. Aristotle says that these three causes ‘often converge on one thing’” (1988, p. 27)
his conception of how the principles become known. It is namely at this point that the notion of first principles takes on a metaphysical meaning by being a concept through which the notion of first principles becomes related to that of form and essence. The soul as we have mentioned is namely said to be ‘the sake for which’ the matter of the body exists. This means the living organism has its essence inside of itself as opposed to artefacts which rely on an outside source (e.g. a sculptor) to give it a meaning or reason to be. This consideration is one of the important ways in which the notion of a first principle (arché), that of the soul being a first principle of the living body in this case, takes on metaphysical meaning and is identified with Aristotle’s hylomorphic concept of cause.

Furthermore, Aristotle’s epistemology having turned into metaphysics at this point then turns back onto itself again to throw light on the epistemological inquiry, with the newly won metaphysical notions. The concept of soul is relevant to his theory of knowledge by allowing us to describe in virtue of which capacities living beings vary in their complexity. What one should have in mind here are the type of descriptions from De Anima in which Aristotle describes for example how plants live only by the capacity of intake of nutrition, and propagation, while animals additionally have the capacity for perception.

In light of such descriptions, the question is warranted in virtue of which capacity the soul is able of undergoing the process of grasping the first principles. In other words, we should expect there to be a particular capacity corresponding to the activity of grasping first principles. It is clear that induction is the process whereby first principles become known. But what is executing this process? Surely the most common sense answer is: ‘the mind’, or some power of thought. This is what I have in mind when I propose intuitive thinking is actively involved in grasping the principles.

The problem with a view that regards nous or thought only as a product of induction (epagoge) I find, is that it cannot account for the particular way in which Aristotle consistently describes how the objects of the principles become known. E.g. we come to know a human soul as ‘that for the sake of which’ the body exists, as the essence of the organism. To put it in other words: a common perspective on induction is not equipped to escape the problem of the contingency of a posteriori, or experiential knowledge. Aristotle’s theory circumvents this problem by offering a solution which recognizes a posteriori knowledge as necessary.

If we now turn to Met I.1, with the question in mind of ‘to which capacity does Aristotle ascribe the execution of induction?’ we find that beyond relaying the process of induction in
similar fashion, in this passage, Aristotle introduces the capacities of art (or skill as it is also translated) and reasoning to the context and beyond that, purports that ‘art arises, when from many notions gained by experience one universal judgment is produced’.\(^5\)

By nature animals are born with the faculty of sensation, and from sensation memory is produced in some of them, though not in others. And therefore the former are more intelligent and apt at learning than those which cannot remember. . . . The animals other than man live by appearances and memories, and have but little of connected experience; but the human race lives also by art and reasonings. And from memory experience is produced in men; for many memories of the same thing produce finally the capacity for a single experience. . . . And art arises, when from many notions gained by experience one universal judgment about similar objects is produced (Met. I.1, 980a28-981a7, italics are mine).

This passage gives a significantly more detailed account on how the principles become known than the comparable passage from \textit{APo} II.19. Here Aristotle puts stress on the fact that human beings have a capacity beyond memory and mere experience through which the principles become known. True, Aristotle speaks here of how art arises, but the immediately following passage make it abundantly clear that in a basic sense, perception of universals and knowledge of first principles should be assimilated to the notion of art, as a possession of these turn out to be necessary to raise a person to the level of art.

. . . to have a judgment that when Callias was ill of this disease this did him good, and similarly in the case of Socrates and in many individual cases, is a matter of experience; but to judge that it has done good to all persons of a certain constitution, marked off in one class, when they were ill of this disease, e.g. to phlegmatic or bilious people when burning with fever, - this is a matter of art (Met. I.1, 981a7-12).

The point of this passage is that: beyond having the memory of a repeated exposure to a phenomenon, in other words to have experience with it, it takes the ability to make a universal judgment to be able to; first of all mark of people in certain classes, be it people of a certain constitution, like phlegmatic or bilious or that have a certain condition, e.g. depression or asthma; and furthermore to judge that people in the designated class are generally helped by a given treatment – like opening swollen airways that are limiting breathing, in the case of asthma. From considering this example it should be clear that Aristotle is clearly suggesting

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\(^5\) To not get thrown of by the term ‘art’ in this context, be sure not think of it in the narrow terms we commonly do nowadays, but rather imagine something such as is meant in the term ‘bachelor of arts’ – the translation of the original Greek is perhaps a bit outdated here, but is in any case aimed at capturing a width of human activity that requires a form of knowledge and understanding for its successful execution.
another ability above and beyond memory and experience is actively involved in the process of grasping the principles. I suggest that this ability simply is intuition or intuitive thinking (*nous*). However, the relationship between experience and intuitive thought is a nuanced one.

Experience seems to be very similar to science and art, but really science and art come to men through experience; ‘for experience made art’, as Polus says, ‘but inexperience luck’. And art arises, when from many notions gained by experience one universal judgment about similar objects is produced. (*Met* I.1, 981a1-7, italics are mine).

This passage makes it clear that whatever notion of intuition we want to entertain, it has to be one which is *a posteriori*, it would have to develop out of experience. This means *nous* would have to be a dynamic and actively involved state or capacity.

The only passage that is left to be explained to counter the proponent of the empiricist view is the very last section of *APo* II.19, in which *nous* finally makes an occurrence in the chapter.

All understanding involves an account. Hence there will not be understanding of the principles; and since nothing apart from comprehension [*nous*] can be truer than understanding [*episteme*], there will be comprehension of the principles. This emerges both from our present inquiry and also because, just as demonstration is not a principle of demonstration, so understanding is not a principle of understanding. (*APo*, II.19)

In this passage Aristotle repeats what he has mentioned twice in passing, (at; I.33, 85a1 and at: I.33 88b36), that *nous* is a principle of understanding. Aristotle’s use of the word *nous* is anyway very scarce in the entire *Posterior analytics*, apart from the two earlier brief remarks, II.19 is the only chapter that discusses *nous*. So, we can safely draw conclusions as to how the term is used in the text in general from these remarks. *Nous* is here identified as the state (*hexis*) which is more precise and comprehends the principles and is therefore itself the principle of understanding – which is to say, it provides the premises which enables and from which deductive demonstrations are done. With regards to whether *nous* on the basis of these remarks is or is not actively involved in knowledge acquisition seems really hard to say, as there truly is very little to go on. Admittedly, this seems in favor of empiricist interpretations, but this is also because the English ‘state’ as a translation for the Greek *hexis*, changes the light in which the matter comes to be viewed in a way favoring the empiricist type of interpretation. The word ‘state’ is suggestive of states such as wakefulness or being satisfied. These are states which we have in virtue of having done something, much like it is suggested on the empiricist account that *nous* is acquired through induction.
But other viewpoints suggest the matter isn’t that simple and hexis might also in the case of nous entail an involved, active state of being which wouldn’t fit the empiricist description. Pierre Rodrigo in ‘The Dynamic of Hexis in Aristotle’s Philosophy’ (2011) has urged ‘‘we cannot insist too strongly on the active sense of Aristotelian hexis – which is partly obscured by the Latin translation as habitus, and above all by the translation ‘stable state’, or indeed ‘habit’ or ‘way’ of being’’ (p. 12). He concludes that ‘whatever its limitations may be, hexis, such as Aristotle presents it to us, involves a vectoral, dynamic conception of being.’’ (ibid. p 14.) This means, a hexis in Aristotle is something which transport it’s carrier from a to b as opposed to a static state such as being wakeful or being satisfied, which are neither dynamic nor vectoral – meaning they don’t transport their carrier from a to b, there is no directionality. If we are satisfied, we just are, same goes for wakefulness. Now, if we are to take the points from Rodrigo’s article into consideration, the matter would stand very differently with regards to the plausibility of nous being actively involved in knowledge acquisition. It becomes much more likely, if a hexis is to be understood as an active and dynamic state, a capacity to bring its possessor form a to b.

There is a parallel account to this last passage just discussed from the APo in EN VI.3 that mentions nous as being among ‘‘the states by virtue of which the soul possesses truth by way of affirmation or denial’’ (1139b15-16). In itself not an uncommon expression for Aristotle, he also speaks of judgement being made in the context of perception, but nonetheless, it’s noteworthy that nous again is mentioned as a state (hexis) which is itself said to be responsible for enabling the soul to possess the truth. This subtlety carries all the more weight considering Aristotle makes mention a little further down in the passage of the fact that it is by induction that the principles are reached, which apparently was not reason enough to exclude nous from the states by which the soul possesses the truth.

6. Briefly on the concept of intuition

In this section I make some brief comments on the type of intuition that I suggest we should ascribe to Aristotle and review the strongest argument in favor for interpreting nous as actively involved mental insight in the process of induction.

Given the central role that the process of induction obviously plays in Aristotle’s account of how we come to know the principles, it is understandable that commentators such as Barnes
who tend towards an empiricist interpretation will have their reservations concerning the translation of ‘nous’ as intuition, at least in as far as ‘intuition’ would introduce a mysterious element into the equation which seemingly relieves the interpreter of the burden of having actually to explain how the first principles become known: as Barnes relates critically: ‘intuited truths are just ‘seen’ to be true; intuiting that $P$ is coming to know that $P$ without any ratiocination and without using sense-perception – it is ‘seeing’ that $P$’’ (Barnes, 1993, p. 267).

I agree that this type of intuition, we may call it a priori intuition is absent from Aristotle’s philosophy. Rather, the type of intuition I endorse is an a posteriori version which works in symbiosis with perception and memory. It simply does the work of differentiating and recognizing things, it is a rational capacity for discernment.

I agree with Barnes that the strongest single argument in favor translating nous as ‘intuition’ is to be found in EN. VI.11 where Aristotle says that nous is concerned with the ultimates [sic] in both direction; for both the primary definitions and the ultimates are objects of comprehension [nous] and not of argument [translating logos], and in demonstrations comprehension grasps the unchangeable and primary definitions, while in practical reasonings it grasps the last and contingent fact, i.e. the second proposition. For these are the starting-points of that for the sake of which, since the universals are reached from the particulars; of these therefore we must have perception, and this is comprehension. (1143a35-b5)

Here, nous is ascribed a rather surprisingly large role, most notable, I find, is that nous once again is identified with a form of mental insight. That Barnes finds the passage is without parallel elsewhere, I cannot agree with, for example in De Anima we find a very clear statement amounting to the same, where Aristotle simply and straight out says: “[t]hinking and understanding are thought to be like a form of perceiving (for in both of these the soul judges and recognizes some existing thing)” DA. III.3, 427a20-23.

7. Conclusion

In this essay I have from various perspectives considered the question of whether nous is part of the process of induction helping to reach the first principles by means of a form of mental

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6 ‘Logos’ yields several quite distinct translations based on the context. ‘reason’ is another prominent translation. In any case, the key point to get from this passage is that ‘the ultimates’ are not the subject to demonstrative knowledge as are the syllogisms, hence Barnes’ choice of ‘argument’ in this passage.
insight or whether it is rather a state of knowing brought about through a successful induction alone.

I have argued we should be careful of drawing conclusions about the nature of the involvement of *nous* in the grasping of first principles on the basis of *APo* alone. The reasons for this are given in the connections I have drawn between the material we have reviewed of Aristotle’s account of intellectual knowledge from *Met.* I.1 which solidifies the picture of (*epagoge*) as involving a process of grasping ‘the why’ of phenomena and the account of the intellectual grasp of the forms in *DA* II&III which should be understood as a parallel to the process of induction (*epagoge*) described in *APo* II.19 reaching the first principles. The unified picture emerging from these texts together with *APo* II.19 gives a convincing answer as to why *nous* should be understood as an integral part of the process of induction. The reason lies in the fact that Aristotle’s version of induction is not just a simple matter of abstraction from particulars to universals combined with extrapolation of the conclusion to the entire population, but rather relies on a form of mental insight which is an ability to grasp universal features of things called first principles which, as well as epistemic concepts, constitute the principles which organize the natural world.
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