WHO HAS KNOWLEDGE? : INTERROGATING ARISTOTLE’S SCIENCE AND CRAFT KNOWLEDGE WITH AN ANTHROPOCENTRIC LENS

Matthew Erickson

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 One of the values of an accurate and nuanced account of the production of knowledge is its capacity to diagnose accurately which kinds of beings may produce which kinds of knowledge. At least two distinct forms of knowledge which Aristotle examines are: *episteme* (scientific knowledge) and *tekhne* (craft knowledge). However, when we interrogate Aristotle’s *Physics, Metaphysics, Nicomachean Ethics,* and *Posterior Analytics* through an Anthropocentric lens, the question of which kind of beings have either scientific and/or craft knowledge becomes clouded. Specifically, we will see that at each stage of the process of acquiring knowledge, from an understanding (*nous*) which is closely related to perception, to memory, experience, craft and science, greater biases towards humans are revealed. While initially these biases are justified, at the higher levels in this process of knowledge acquisition there exist tensions, the most prominent of which are inconsistencies in how Aristotle defines what is natural and the implicit criteria of language for the diagnosis of whether an animal possesses craft or science. These tensions produce less than optimal tools for diagnosing which kinds of beings possess certain kinds of knowledge, which is crucial a strong account knowledge production.

 To begin, we ought to examine how understanding plays a role in how Aristotle thinks we come to acquire scientific and craft knowledge. To Aristotle, our knowledge arises from understanding, and our understanding is rooting in something other than platonic innate ideas. When we read his *Posterior Analytics,* we see that, “It would be absurd if we had the principles <innately>; for then we would possess knowledge that is more exact than demonstration, but without noticing.”[[1]](#footnote-1) To Aristotle, our understanding must be acquired through “some <suitable> potentiality, but not one that is at a level of exactness superior to that of the knowledge we acquire.”[[2]](#footnote-2) This potential is perception, through which we acquire specific understandings about the world. From perception, we may acquire knowledge through a multitude of steps which may culminate in science or craft. “From perception… memory arises, and from repeated memories experience… from experience… arises a principle of craft or scientific knowledge.”[[3]](#footnote-3) From perception, memory, and experience our understanding is able to acquire inductively certain kinds of knowledge.

 Now that we see the role understanding and perception play in facilitating our knowledge production, we can begin to examine the extent to which Aristotle thinks humans have a more central claim to craft and science than non-humans. Initially Aristotle is even handed in describing which kinds of beings possess knowledge, as he argues fairly that animals, for the most part, have an equal share in perception. “All animals evidently have <such a potentiality>, since they have the innate discriminative potentiality called perception.”[[4]](#footnote-4) If all animals, human and non-human alike, perceive, it seems that Aristotle agrees that the potential for animals to acquire knowledge is significant. After all, if a number of these beings have equal access to the most fundamental potentiality in a process of knowledge production, then there may not be a bias towards certain beings over others. However, we will see certain anthropocentric biases grow more significant as animals and humans are compared at higher transition stages of perception to memory, memory to experience, and experience to knowledge.

Each step in the process of acquiring either scientific or craft knowledge appears to consist of its own kind of potentiality, in which the capacity to transition to a higher stage is itself open to variation between beings. In the transition of perceptions to memory, for instance, some animals have different capacities to remember than others. “Some animals… (though not all of them) also retain <in memory> what they perceive; those that do not retain it have no knowledge outside perception.”[[5]](#footnote-5) So rather than all animals having equal access to craft and scientific knowledge, it appears that those with better potentials for memory, such as humans, will be more likely to acquire craft and science than, say, goldfish.

An implicit diagnostic bias towards humans on the basis of their potential for retaining perceptions in memory is a fair bias to hold, since it does not arbitrarily exclude certain beings but rather filters them based on reasonable criteria. In fact, animals still seem to have the potential to acquire a certain kind of generalizing knowledge, for animals “that do retain it [perceptions in memory] keep what they have perceived in their souls even after they have perceived. When this has happened many times… in some, but not all, cases, a rational account arises.”[[6]](#footnote-6) The notion that a rational account may arise in animals thanks to their capacities for memory, while not explicitly declaring their potential for craft and science, certainly leaves open the possibility that craft and science may be acquired.

 When we read Aristotle’s *Metaphysics*, however,we see that he thinks it is not just in memory that animals are limited while humans are not. Nonhuman animals also often struggle with transforming memory to experience. “Nonhuman animals live by appearances and memories but have little share in experience, whereas human beings also live by craft.”[[7]](#footnote-7) Aristotle claims the next stage in knowledge production, the transition of memory to experience, is also far weaker than is found in humans. However, rather than explaining that some animals have a greater capacity for transforming memory into experience than others, we see a more arbitrary explanation that, if a being is a nonhuman animal, it *must* have little share in experience.

Still, in discussing the transitionary stage of memory to experience, Aristotle does not necessarily exclude all diagnoses of nonhuman animals possessing knowledge. Just like the transition of perception to memory, perhaps Aristotle meant that some beings have a greater capacity to transform memories to experience than others. Consider whether Aristotle were presented with a counter example to his generalization about all nonhumans having little share in experience. Consider telling Aristotle that Chimpanzees have been shown to create artificial tools for their own uses in a wide variety of contexts: that they use stone tools to crack open hard nuts, use strong sticks to dig in the ground for tubers and underground bee hives, and will even sharpen sticks to spear bush babies sleeping in tree holes.[[8]](#footnote-8) In the context of the passages so far examined in the transition of memory to experience, one could still imagine that Aristotle would allow that such creatures as Chimpanzees hold a kind of experience which could become craft knowledge. Like early humans, who produced simple crafts to make their lifestyles easier, so too could one consider the behaviors of chimps as ones which consist of the potential for craft knowledge. “In the earliest times anyone who discovered any craft that went beyond the perceptions common to all was admired… for being a wise person… some [crafts] related to necessities, others to [leisuretime] pursuits.”[[9]](#footnote-9) It seems a reasonable conclusion that, if early humans who produced spears can be considered beings in possession of craft knowledge, so too could apes who sharpen sticks for hunting.

Whether or not we may diagnose nonhuman animals as possessing craft knowledge is not only important for its own sake, but also because at least in some instances it appears that craft knowledge is a prerequisite to scientific knowledge. When discussing early humans’ first sciences, Aristotle explains that those sciences emerged only after crafts did. “Finally, after all these crafts had been established, the sciences that aim neither at pleasure nor at necessities were discovered.”[[10]](#footnote-10) Even if we do not see any animals which possess scientific knowledge, if it could be shown that there are some nonhuman animals which possess craft knowledge then we would be one step closer to showing that nonhuman beings have the potential for scientific knowledge.

In the *Physics* we see tensions regarding whether nonhumans possess craft knowledge based on competing descriptions of the natural. Specifically, Aristotle describes those who belong to nature in a way which both implicitly accepts that animals may craft and which explicitly denies that they may craft. This tension is important because Aristotle shows that that which is crafted is not natural, but rather something which “completes the work that nature is unable to.”[[11]](#footnote-11) The difference between nature and a thing crafted, to Aristotle, is that that which is natural crafts itself, while that which is not natural must be crafted by something external to itself.[[12]](#footnote-12) For instance, a tree that grows, heals, and produces seeds crafts itself and other trees naturally, while a house produced, repaired or copied by a housebuilder is done so unnaturally. Aristotle’s interpretation of what is natural seems to lend credence to the notion that a sharp stick, a weapon, is not produced naturally but by a being with the knowledge to craft such a tool. After all, just as homes do not produce themselves, neither do sharpened sticks. Such an interpretation of the natural seems to permit animals, in some cases, the potential to acquire craft knowledge. After all, it seems reasonable to say that that which is crafted outside of nature must be so crafted by a being which possesses craft knowledge.

However, Aristotle explicitly denies that nonhumans possess craft knowledge by virtue of their role in producing things which cannot produce themselves. “In the cases of animals other than man… they use neither craft nor inquiry nor deliberation in producing things.”[[13]](#footnote-13) Aristotle does not clearly explain why nonhuman animals do not possess craft, but rather assumes so. While previous distinctions between humans and non-humans have been somewhat qualified as showing that humans are more likely than nonhumans to possess knowledge, in the *Physics* we see direct claims that animals do not possess craft. In fact, an example Aristotle provides to disprove the notion that animals may possess craft knowledge instead seems to show the opposite of his denials of nonhumans’ potential for craft knowledge. “If a swallow makes its nest… for some end…it evidently follows that this sort of cause is among things that come to be by nature.”[[14]](#footnote-14) A swallow’s nest seems a perfect analogy to a humans’ house, in that both are produced from timber by an external being for a purpose which the timber did not have as an end within itself. Aristotle simultaneously defines the act of building a house as the non-natural product of a being with craft knowledge and the nearly identical act of a bird building a nest the natural product of a being without craft knowledge.

One might reasonably respond to the notion that Aristotle introduces tensions in our understanding of craft knowledge by arguing that there are additional criteria to craft knowledge aside from those which distinguish craft knowledge from nature. For instance, in the *Metaphysics*, Aristotle allows that some who possess experience, and even some who perform all the behaviors of craftsmanship, are not themselves craftsmen. For “experienced people know the fact that something is so but not the reason why it is so, whereas craftsmen know the reason why, i.e. the cause.”[[15]](#footnote-15) To Aristotle, it would be reasonable to characterize the swallow constructing its nest or the chimpanzee sharpening its’ stick as merely a manual craftsman, one who builds without knowledge. “The manual craftsmen, we think, are like inanimate things that produce without knowing what they produce, in the way that, for instance, fire burns.”[[16]](#footnote-16) Just as fire burns, or trees grow, so too do swallows, chimps and even manual laborers produce without craft.

When examining the qualification that a craftsman understands the reason something is, however, we see that an implicit diagnostic criterion which happens to belong uniquely to humans is applied: that humans have language while animals do not. Aristotle could uphold the denial in the *Physics* that animals possess craft on the basis of their not knowing the cause on the grounds that no animal has so demonstrated. However, the only way for an animal to show that “they have a rational account and know the causes,”[[17]](#footnote-17) is in a written or spoken language. Like asking one who is mute to speak, the kind of criteria Aristotle uses to diagnose beings as possessing craft knowledge relies on assumptions which are skewed towards humans. It would be perfectly reasonable to imagine a chimpanzee discovering through insight or deliberation both how and why to use a certain tool, and yet still unable to prove to Aristotle that it understands the cause simply because it cannot speak or write. Whether a chimp in fact does understand the cause is beside the point. If one cannot clearly use Aristotle’s descriptions of craft knowledge in such a way as to accurately diagnose which beings possess craft knowledge and which do not, then Aristotle’s descriptions of craft knowledge are in want of improvement.

The same language biases that have been applied to craft knowledge may also be applied to those of scientific knowledge. While it was already established that craft knowledge, in at least some cases, appears to be a prerequisite for scientific knowledge, it is also the case that the capacity to demonstrate one’s scientific knowledge is limited by language. Scientific knowledge, as described in the *Nicomachaen Ethics*,is a form of universal, necessary knowledge difficult to demonstrate without language. “[Scientific Knowledge] does not admit of being otherwise…What is known scientifically is by necessity. Hence it is everlasting.”[[18]](#footnote-18) How can an animal share that it knows something which cannot admit of being otherwise without speech?

 A good account of knowledge production ought to be consistent and rigorous enough to diagnose the kinds of beings capable of different kinds of knowledge production. However, tensions in what constitute nature rather than a being in possession of craft knowledge reduces the clarity of Aristotle’s account when diagnosing beings which are not human. Additionally, it is only by a mode of communication they may not have that a nonhuman being can demonstrate that they possess a rational account for a product or knowledge of something which does not admit of being otherwise. It is in part due to the implicit criteria for language that Aristotle’s account of knowledge is diagnosed along the lines of a self-fulfilling prophecy. One might argue that language is not necessary to knowledge production but merely to a secondary concern of diagnosing the kinds of beings which produce knowledge. However, Aristotle frequently utilizes the anthropocentric tendencies we have discussed to rule out the possibility of nonhumans’ capacity for knowledge of science or craft. At least some animals seem to possess craft knowledge similar to that of early humans. Ultimately, we ought to give nonhuman beings more credit for their capacity to acquire knowledge than some of Aristotle’s texts argue to be possible.

Bibliography

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