2014

On the Knowledge of Primary Substances

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Within Aristotle's categories, primary substances are conceived to exist separate from the properties that describe or comprise them. By formulating substance and property as such, Aristotle revives the epistemic tool, forgone in Plato's days, of observation. However, he threatens its renewed relevance when he fails to give an adequate demonstration of how observation may determine the definitions of substances—namely, how one may distinguish essential from accidental properties. Thus, my task is to save Aristotle's epistemology by conceiving a new understanding of essential and accidental properties, one that, if successful, will reinforce the importance of observation in our exploration of concepts.

In this paper, I address what I deem a crucial epistemic concern underlying Aristotle's concepts of substance and property. However, before I begin, let us consider two basic tenets of his beliefs. Firstly, unlike Plato, whose interests lie in the abstract Forms, Aristotle emphasizes primary substances—objects of the material world—to which everything else categorically belongs. A certain shape, size, and softness are properties belonging to an individual bed, for instance; virtue is a property belonging to

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that particular object which is virtuous. Secondly, among properties belonging to primary substances, he distinguishes those categorically comprising a substance's account, known as essential properties and necessarily belonging to a substance, from those he claims to arise from coincidence—namely accidental properties—which do not comprise a substance's definition.

Given these distinctions, it seems that we need only recognize essential properties, necessary to describe the essential natures of substances, in order to attain knowledge of the material world. However, the question now arises: How does one distinguish essential properties from accidental properties? After all, Aristotle leaves much to be desired in addressing this question. Within Posterior Analytics, he describes four cases where A is essential to the description of B and thus 'belongs to B in its own right':

A) A is a necessary component of B, such as a point in a line.
B) A is a necessary component of B and B itself is necessary to describe A, such as straightness in a line.
C) The account A of a substance B exclusively describes B.
D) A is a necessary component of B simply because of B itself. For instance, an animal must be killed in order to be sacrificed and "it was not a coincidence that the animal was killed in being sacrificed."[1]

In summary, A represents a definitional element of B whose essence is already known. However, while these conditions allow us to define the essential properties of mathematical or geometrical elements—substances known a priori—they do little to explain how properties comprising the definitions of ordinary substances and known empirically may be recognized if their definitions are yet undiscovered. In other words, the justification for a property's essentiality cannot be verified until the definition is known; however, the definition cannot be known without having determined the substance's essential properties—we are led full circle. Thus, the purpose of this paper is to address these concerns by exploring two possible responses to the epistemic

question of how we recognize essential properties, and evaluating Aristotle's possible reply to each. Following this, I plan to formulate my own understanding of essential properties in order that Aristotle's classification of properties may retain its epistemic relevance despite certain problematic applications.

I.

The first response that I shall consider invokes what I conceive as and call the statistical argument. It states that essential properties are simply more present among the total population of considered objects than accidental properties, and if one desires to know the essences of things, one needs only determine which properties are more prevalent by means of statistical techniques.

However, several problems immediately occur with this response. First, how should one understand the condition of 'more'? To be clear, the term certainly should not imply an irrelevant difference in prevalence, since to allow such loose interpretation would be to trivialize the distinction between essential and accidental properties. Rather, I should say that the difference in prevalence must be shown to be statistically significant—in other words, we must have high confidence by means of calculations that properties deemed essential are consistently and definitively more present in the total population. Thus, we would have both a nontrivial and empirical means of determining the essential properties of substances.

However, can this reply adequately appease the skeptic? Consider the following case: Suppose that 99% of cows are black and white, and 1% of cows are purple, where the purple cows are located on an island removed from the rest of the world. By statistical reasoning, we may believe that black and white is an essential feature of the cow, not only because it is more prevalent, but also because it is more prevalent in a statistically significant sense. Now imagine that some unforeseen event kills all black and white cows but spares the purple cows. According to the statistical argument, any person desiring to know the essence

of the cow, following the disaster and by valid statistical methods, would be justified in considering purple to be an essential feature of cows. However, at a previous time, one would have said an essential feature of cows was their black and white coloration. Therefore, if the essence of a cow is as unchanging as Aristotle claims in that "it will not be possible for the same thing to be and not to be," the statistical argument cannot be a valid means by which to determine essential properties.[1]

There are two ways in which Aristotle might attempt to save this response in order to satisfy the epistemic challenge. First, he might offer a classificatory scheme that allows both for purple to be an essential feature of purple cows, and for purple cows to still be cows whose essential properties do not include purple. For instance, the cow might be what he calls the 'secondary substance': "The species in which the things primarily called [primary] substances belong."[1] Purple cows would thus constitute the 'primary substances' whose color purple would indeed be an essential property of purple cows, while black-and-white would represent an essential property of black-and-white cows. Given this classification, there would be no contradiction in the above case since purple cows and black-and-white cows would be entirely different primary substances—entirely different individual things—altogether, both within the larger category of cow.

However, I believe this response does not satisfy the real epistemic concern: for the person who has never seen or known a black-and-white cow before and who is unaware that the genus cow may be divided into purple cows and black-and-white cows, a cow is purple. To him or her, that species of purple cow is not a subclass of cow, but rather the cow itself. Once again, we face a contradiction, since those who had only known black-and-white cows to exist in a previous time would have, according to the statistical argument, been compelled to conclude that black-and-white represented an essential property of the cow. Thus, if we concede purple to also be an essential property, it appears that no epistemically objective or, more importantly, unchanging fact of the matter would exist—it would just so happen by chance

that the cow has certain 'essential' features because of one's epistemic circumstances.

Here we consider Aristotle's second attempt to save the statistical argument. He might simply regard the person, for whom purple is an essential property of the cow, to be wrong. In other words, he might insist that there is an epistemically objective fact of the matter: black-and-white, or no color at all, is an essential feature of the cow, and he who thinks otherwise is mistaken. However, to Aristotle, I would reply that even if the person is wrong, he cannot know he is wrong if essential features are simply defined as those properties which are statistically more present. If one considers the epistemic question at hand of how we recognize essential properties, it appears that the statistical distinction between essential and accidental properties is too shallow and must be revised if we are to suppose an epistemically objective fact of the matter.

II.

A second response that I shall consider involves what I call the functional argument—a response most like Aristotle's own view—which identifies essential properties as those helpful to achieving the substance's 'end' or 'function'. In this section, I will discuss what I consider a key weakness in this approach; however, before I begin, let us first clarify certain points of Aristotle's physics.

According to Aristotle, in order to have knowledge of substances—to know why things are so—we must possess explanations arising from four causes: 1) A material cause that explains the substance's properties in terms of its constituents and material parts; 2) A formal cause that invokes as explanation a substance's essential nature and essential properties; 3) An efficient cause that explains the source of change within a substance or how the substance came to be; and 4) A final or teleological cause comprising the 'end' of a substance, or what the substance is for).[1] For instance, Aristotle would cite the material cause of a pen to be its plastic and ink, the formal cause to be the essential

properties of the pen e.g. its shape, the efficient cause to be the machine that made the pen, and the final cause to be what the pen is for—to write. It is worth noting that, according to Aristotle, the final cause would not be man-made as appears in the above example, in which the pen's final cause is designated by a human mind. Rather, the final cause would rely on the form of the substance; therefore, the end of a substance would be to exhibit its essential nature—"the form must be what things are for."[1] This statement embodies what I call the functional argument and appears to resolve concerns that have plagued Aristotle's concept of essence thus far. Some might say that we now have a means both epistemically objective and universal by which to identify essential properties: first, determine what a substance is for; next, determine the form of the substance and its essential properties.

However, I reply that Aristotle's explanation in fact does little good. According to Aristotle, the essence must inform the final cause of a substance that we had hoped, via the functional argument, to inform its essence. What is he to do who knows neither the formal cause nor final cause of a novel substance? Once again, we are led to the question of how we empirically determine a substance's form or essential properties given no tools but observation. Aristotle might offer a second clarifying statement that an essential property is that which allows the substance to be a flourishing exemplar of its type—to be excellent. After all, according to him, "by 'end' we mean not every terminus but only the best one."[1] Unfortunately, this raises the further question as to how we should understand the term 'excellent,' especially in treatment of non-living substances where survival and reproduction cannot play a part. For instance, imagine that an early human happens across a sharpened pencil. He has never seen this particular object before, but he knows of objects close in appearance: spears and knives, for instance. The pencil is sharp; it is made of woody material. To the early human, the pencil's excellent 'end' is that of a weapon, and he distinguishes essential properties as those contributing to that end. That the pencil writes is irrelevant and is thus deemed an accidental property.

Thus, even if an epistemically objective fact of the matter exists and the early human is wrong, how is he to know he is wrong? We may conclude that the functional argument too fails to address the epistemic questions at hand, and problems with the statistical and functional views compel us to redefine 'essential property' in such a way as to circumvent these concerns. Otherwise, we may never know the essences of material substances whose forms must be discovered empirically.

III.

In the previous sections, we questioned the relevance of essential and accidental properties when we struggled to discover a means by which to distinguish these two kinds of properties. After all, what use is there in defining the essential property as that which describes the essence of a substance, and the accidental property as that which does not, if the distinction offers no clarity in application? One might advocate that we adopt some sort of relativism in which the essence of a substance is simply that which one arbitrarily decides it to be. Thus, we could resolve our quandary by trivializing the distinction between essential and accidental properties such that any properties could be legitimately ascribed to one substance, even those which contradicted each other i.e. if both purple and black and white were deemed essential colorations of the cow, albeit in different contexts. However, we need not relinquish all objectivity yet. In this section, I propose to avoid the relativist's claim and save Aristotle's conception of essential properties by conceiving 1) the form or essential nature of a substance to be a psychological description and 2) the essential properties to be those things which comprise our psychological descriptions. This view I shall call the conceptual argument, whose purpose I claim will be to interpret Aristotle's categories of property in such a way as to generate a plausible reply to the epistemic question.

To begin, let us consider what I mean by 'psychological descriptions.' First, I imply something more complex than simply images which one envisions upon experiencing an evocative trig-

ger—a word, sound, a smell, or other. These images are highly variable; the specific focus and details may differ from person to person. I, for instance, upon seeing the word 'dog' may envision a small, shaggy-haired terrier with a friendly demeanor; on the other hand, someone else might conceive a long-legged, growling hound. However, these two images cannot both in their entirety represent the essential nature of the dog. Otherwise, we might have an infinite number of essential natures rather than only one, a problem if we define essential properties to be those properties necessarily belonging to a substance. That both psychological images—both of the terrier and of the hound—are evoked by the word 'dog' must imply that both images share something in common, a framework of sorts comprising key elements or essential properties of the substance 'dog,' especially since we are not unlimited in the kinds of psychological images that we conceive: we do not envision a tree, for instance, upon experiencing a 'dog' trigger. Consequently, I propose that if we desire to know the essential natures of substances, we need only determine the frameworks of essential properties that compose our psychological images and allow us to recognize the substances as such—these frameworks I will refer to as our psychological descriptions of substances.

In the meantime, one might ask how my formulation of essential properties surpasses the functional argument. After all, are we not obliged to recognize the substance before we can describe it and to describe the substance before we can recognize it? To this question of circularity, I reply "no" for the following reason: unlike Aristotle's functional argument, which offers no means to determine a substance's final cause and thereby essence, I do suggest an empirical method through which to obtain the psychological description of a substance. Consider this: upon encountering a dog, I unconsciously compare my image of a shaggy-haired terrier to the subject before me. While I will consciously note certain differences in details—size, shape, color, demeanor—I will still instinctively and almost immediately conclude that the substance before me is a dog because the new substance meets certain criteria that I have set, given my psychologi-

cal description of a dog. If I encounter a tree, I will unlikely deem it a dog simply because the tree does not meet the criteria set by my psychological description. Therefore, if I desire to know my psychological description of the dog, I need only be presented with enough counter-cases to determine which features of the dog are necessary for me to judge a substance to be a dog. For instance, let us imagine a simple experiment where a subject who possesses a psychological description of a dog is shown various images. For every image he considers to be an accurate representation of a 'dog,' he must quickly respond 'yes,' and for every image that he does not consider a 'dog,' he must quickly respond 'no.' If shown a picture of a tree, we may assume that he will respond 'no' for various reasons: a tree is not an animal; a tree is not four-legged; a tree has no face. In addition, if shown an image of a cat, we may assume that he will respond 'no,' but for different reasons: a cat is smaller; a cat has sharper retractable claws. Note that the subject is not usually conscious of these differences; rather, he answers based on a 'gut' reaction—an intuition of what is a dog. Nonetheless, from his responses, we may glean the essential properties ascribed to the dog by comparing the various images he rejects to those he accepts and identifying differences, increasingly specific as the images grow closer in likeness to the object in question. I do not claim that this method will give us the exact boundaries at which substances teeter into the category of 'dog.' It will, however, allow us an empirical means by which to somewhat clearly glean the essential properties of substances without succumbing to circularity or total arbitrariness.

At this point, I may receive the following response from the relativist camp: are not psychological descriptions subject to various situational influences, given that they originate within the mind and appear to be products of human invention? Does that not imply some sort of epistemic subjectivity to what we deem essential properties of substances? If so, is not Aristotle's distinction between essential and accidental properties once again subject to doubt?

My response comes in two parts. First, I agree that the conceptual argument allows for greater subjectivity than Aristotle would like. To understand why, let us look again at the cow example, first mentioned in section 1 of this paper, and examine how psychological descriptions come to be. Recall that, following the aforementioned disaster, only purple cows exist. Now imagine that a person who has never seen or known a cow before and has no psychological description of cows   desires to know what a cow is. When his guide points to the purple cow and tells him that it is a cow, he will at first have no psychological image with which to compare the substance before him. At that time, there will be no essential properties of cows to him, only accidental properties, and he will simply have to believe his guide. Following this, imagine that he returns to the island several times and is told again and again that various individual purple cows are cows. Most likely, after repeated instances, the person will not be able to divorce the substance 'cow' from the color 'purple.' In this case, as Aristotle said, A will appear to necessarily belong to B, and purple will be known as an essential property of the cow to the person by virtue of his acquired psychological description. Statistical probability would thus, in this way, play a part in the development of one's psychological description. However, imagine that the person desired to know the cow before the disaster and before anyone was aware that purple cows existed on the island. In these circumstances, the guide would point to a black-and-white cow instead, the person would come to consider black-and-white as an essential property of the cow, and we would, it would appear, obtain mutually exclusive conclusions. In this sense, I would agree that what we deem to be essential properties would vary by context.

However, note that in order for the person who has no psychological descriptions to discover the cow, he must have a guide who already possesses a psychological description. The task would have proven near impossible to the person, upon arriving on the island with no knowledge, to determine alone which substance was the cow. As a result, we may conclude that psychological descriptions depend not only upon epistemic con-

ditions, but also upon the psychological descriptions already adopted. Likewise, properties deemed essential at the present depend upon existing beliefs of what is essential. Thus, essential properties admit of relativity from a global perspective, external to the framework of what is socially deemed essential, given that frameworks vary by setting. However, within frameworks, our psychological descriptions remain somewhat objective due to shared psychological descriptions, largely bound by our social and temporal circumstances.

IV.

In response to the question of how we distinguish essential properties from accidental properties, I reply that essential properties are features crucial to our psychological descriptions of substances, whereas accidental properties are not. As a result, given the variability of our descriptions, it would appear that differences between substances—while not entirely arbitrary—are neither as deep and objective, nor are the methods by which we determine the essentiality of their properties as simple, as Aristotle might have supposed. However, in order that we may continue to understand how our concepts arise, further work in both philosophy and other fields will be necessary.[2]

Notes

1. Terrence Irwin, and Gail Fine, Aristotle: Introductory Readings, (Indianapolis: Hackett Publishing Company, 1996).

2. It has been brought to my attention ex post facto that the 'psychological description' mentioned in my paper corresponds to a term in the literature, namely 'cognitive schema.' According to the Charles T. Schmidt, Jr. Labor Research Center, a cognitive schema constitutes the "organization of knowledge about a particular concept." In addition, 'consensual schemas'—much like my 'shared psychological descriptions'—develop when members of a group adopt "fairly similar mental models" to facilitate group interactions. To be clear, my paper did and does not purport to identify novel cognitive phenomena. Rather, its main purpose is to stress the crucial roles that such phenomena play in our epistemic endeavors, particularly with relation to the understanding of material objects, which Aristotle had in mind.