



Theory of Knowledge

## Aristotelian Intellectual Intuition, Basic Beliefs and Naturalistic Epistemology

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**ABSTRACT:** I first argue that Aristotelian intellectual intuition (recognizing *archai* through *epagoge* and seeing their truth by recognizing their explanatory power through *nous*) generates basic beliefs which are not inferred — inductively or deductively — from other beliefs. Both involve synthetic intuitive insight. *Epagoge* grasps a connection and *nous* sees its general applicability. I next argue that such beliefs are properly basic by adapting an argument made by Hilary Kornblith. According to Kornblith, the world is objectively divided into natural kinds. We humans perceive the world divided into natural kinds. There is empirical evidence suggesting that we divide the world not only as it is objectively divided, but in making inductive inferences, that is, in inferring that an object will have certain properties on the basis of its having others. This grounds the reliability of (certain) inductive inferences. But the leading principles (in Peirce's sense) of these inferences are basic beliefs generated through intellectual intuition. Hence intellectual intuition generates certain properly basic beliefs.

For Aristotle science is demonstration from first principles. But how does one arrive at these first principles? We observe particular instances and record those observations in memory. This material generates a *logos*, a meaning. (1) This is the process of *epagoge* which frames or formulates the *archai*. We recognize that *archai* are true, we come to believe them, by the operation of *nous*. Through *nous* we come to recognize the explanatory power of *archai*. In recognizing this, that the *archai* are true to the facts, we recognize their truth. Particular experiences suggest a certain *arche*. But *nous* lets us see that this *arche* "is the way in which the facts can be understood." (2) But, as Randall emphasizes, *nous* does not intuit the explanatory power of these *archai* independently of, or in abstraction from, the facts they explain. "*Nous* does not 'see' the truth of *archai* by holding them up, in isolation ..., and just staring at them; it 'sees' their truth in the subject matter." (3)

Does intellectual intuition generate basic beliefs? Experience suggests *archai*; *nous* grasps their truth by seeing that they explain certain facts. Are these *archai* then inferred beliefs, inferred from the facts they allegedly explain? Are they conclusions of arguments whose premises describe these facts? Aristotle views science as deductive system. The *arche* of that science would not be deduced from more basic first principles. The rest of the science would be deduced from them. But this does not mean that these first principles are not

inferred, on a wider view of inference. Can we arrive at any beliefs through intellectual intuition which are not the result of a conscious process of inference, which are intuitively recognized basic beliefs?

Let us consider the two components of intellectual intuition, *epagoge* and *nous*. Does Aristotle conceive of *epagoge* as an inferential operation? "Out of sense-perception comes to be what we call memory, and out of frequently repeated memories of the same thing develops experience;...the universal now stabilized in its entirety within the soul." (4) But clearly our memories are not inferred from our sense perceptions; perceptual beliefs are not the premises of memory beliefs. We are thus not constrained to understand the development of experience as an inferential development or a mode or type of inference. Experience suggests the implicit universal which becomes explicit or evident through repetition. *Epagoge* then is a faculty of being appeared to suggestively and of our framing statements of connection on this basis. Viewed in this way, *epagoge* is not an inferential mechanism, but an intuitive mechanism, apprehending connections in the light of which the world is intelligible or meaningful.

But *nous* leads us to see the truth of the *archai* apprehended through *epagoge*, converting these suggestions into beliefs. What *nous* is doing here is to recognize that certain facts are subsumed under the *archai* as laws. This indeed is something which Wesley Salmon recognizes as basic to all scientific explanation. (5) But what does subsumption under law mean and how is it recognized? Is it an essentially inferential process? One who holds the inferential conception of scientific explanation might claim that *nous* recognizes certain inferential relationships between the *archai* and the phenomena or occurrences they explain. *Nous* recognizes that the phenomena can be inferred, either deductively or statistically, from the *archai* together with statements of other facts such as initial conditions. On this view, subsumption under law or universal statement just is this inferential relationship. Hence *nous* is a special employment of reason.

As Salmon points out, however, the inferential conception seriously misconstrues the nature of subsumption under laws. (6) It is too narrow, excluding certain *bona fide* causal explanations. If we explain why someone has contracted leukemia "by citing the fact that he was...2 kilometers from the hypocenter at the time of [an atomic] explosion," (7) one is appealing to a statistically relevant relation to make the explanation. However, from this statistically relevant information we cannot *infer* that the person will contract leukemia. The probability that such a person will contract leukemia is much less than one-half. However, for a correct statistical *inference*, the inductive probability would have to be at least over one-half.

What is involved in subsuming this person's contracting leukemia under law is recognizing the statistical relevance of the distance to contracting the disease, that the probability of one's contracting leukemia is significantly higher for those 2 kilometers from the hypocenter of an atomic blast than the probability of contracting the disease in the general population. This involves recognizing that one probability is distinctly higher than another. But this is to recognize that one mathematical quantity is higher than another — a substantive mathematical statement.

We can now appreciate the division of labor between *epagoge* and *nous* in rational intuition. *Epagoge* *intuits a connection*. Recognition of the connectedness is the contribution of intuition. Recognizing that a particular occurrence can be subsumed under a connection discovered by intuition is the work of *nous*. By virtue of recognizing this subsumption, an intuition becomes a *rational* intuition, rational in the sense of being recognizably connected to a body of evidence, the occurrences subsumed under the regularity.

Is the recognition by *nous* of the explanatory power of the intuited causal connection recognizing a justifying reason for believing or accepting that the connection holds? If so, then the beliefs intellectual intuition generates *will be inferred beliefs, beliefs inferred from or founded upon the confirmatory material* *nous* recognizes. Suppose we witnessed several explosions of various sorts and in each case debris was scattered outward from the point of the explosion. Surely our combined experience of these interactions, our experience constituted by our perceiving and remembering these events, suggests a causal connection between the explosion and the scattering of the debris. But we can also see not only for each individual case of our experience but synthetically for all of them together that the explosion causes the scattering of the debris, that the scattering phenomena can be subsumed under this regularity. We recognize in one synthetic insight the explanatory power of the causal regularity we have intuited. But this synthetic insight is not an inference. We are not constructing an inductive argument from descriptions of instances of the causal regularity as premises to the nomic generalization as conclusion. Rather we are seeing the explanatory power of this regularity as evident in these instances. But if this belief results from viewing our experience through some synthetic intuitive insight, it is a basic and not an inferred belief.

Is such a belief properly basic? Would we be justified in accepting such a belief as we ordinarily would be justified in accepting a perceptual belief? Recent work in naturalized epistemology is relevant to assessing the reliability of intellectual intuition. This involves the concept of a natural kind. Clearly, humans see the world divided not just into sets of objects sharing some common property, but into natural kinds. Hilary Kornblith points out in *Inductive Inference and Its Natural Ground* that recent empirical work shows that children do not acquire this belief at some stage of development, but hold it "from the beginning." That the world divides itself into natural kinds seems to be a basic belief. Kornblith argues that we may find genuine natural kinds in nature, involving clusters of properties — properties which tend to occur together in nature and which the causal structure of the world impels to occur together. Only some combinations of properties are causally possible or causally stable. By virtue of these causal constraints, certain properties cluster together constituting a natural kind.

How do we come to recognize these common properties of a natural kind? In many instances, this may involve rational explanatory inference as opposed to rational intuition. We observe "that certain observable properties tend to be found together. ...Unobservables are then postulated to explain the constant conjunction of observable properties.... Thus, we come to know of the existence of unobservables by way of an inference to an explanation." (8) But not all the beliefs we form in connection with our ability to recognize natural kinds need be inferred. Kornblith argues that humans have "a sensitivity to those features in objects which tend to reside in homeostatic clusters; and a tendency to project those characteristics which are indeed essential to the real kinds in nature." (9) To be sensitive to homeostatic property clusters, we must be sensitive to properties which tend to occur together in nature. This is called co-variation. Clearly we can come to form beliefs about co-variation without forming hypotheses concerning underlying causal structure. Such claims of co-variation may be candidates for basic beliefs generated by rational intuition.

What is involved in detecting co-variation? We may see here the *epagoge-nous* sequence of rational intuition. We perceive a number of instances of a particular pattern of co-variation. From this we become able to project that when a thing instantiates certain properties, it will instantiate others also. This disposition to make this projection is a habit of thought. But surely it bespeaks awareness of a universal or general connection between two sets of properties — the work of *epagoge* — and the fact that such projections can be made, that particulars can be subsumed under this generalization — the work of *nous*.

Why should we regard this pattern of inferences, more generally our co-variation detection mechanism, as reliable? A challenger might question its reliability due to the problem of small numbers. Clearly our evidence for our projections constitutes a sample of co-variation instances. On witnessing a certain number of instances, we make projections. But is our sample too small? Are we flying in the face of principles of good statistical inference? Notice that we might raise this as a problem for Aristotle's intellectual intuition in general. On the basis of our experience, *epagog* recognizes the emergent universal. But is our experience is extensive enough for the "true" universal to have emerged?

Kornblith replies by questioning whether projections or inferences made through recognizing co-variation are statistical. Are they properly subject to the canons of statistical inference? Suggesting that after viewing a certain sample, we are disposed to project any property common to the members of the sample as a property of the population in general greatly oversimplifies our co-variation detecting mechanism. We do *not* project just any property. If a population is an animal species, it will be uniform in the way it bears its young but not in whether its members are confined in zoos. If a population is uniform with respect to a certain property, then we can reliably make a projection to the entire population on the basis of a small sample. Hence if we can discriminate those properties in which a population is uniform from those properties in which a population need not be uniform, and we project just from the uniform properties, then our projections will be reliable. (10)

Now if there are real kinds in nature which involve certain properties as essential, then there will be populations involving uniform properties. If furthermore we intuitively grasp these real kinds in nature, intuitively discern which properties are essential, and project those properties, our projections will be reliable. But there are real kinds in nature, delimited by homeostatic property clusters which also determine the essential properties of the kind. It is an empirical fact that humans do recognize the world as divided into natural kinds. The question now is whether the natural kinds that humans recognize, the kinds into which they divide nature, converge with the actual natural kinds. One must thus establish that humans have "a sensitivity to those features in objects which tend to reside in homeostatic clusters," (11) and then show that it is these features, essential to real natural kinds, which humans do project.

One is sensitive to the features in objects residing in homeostatic clusters only if one is sensitive to co-variation. (12) Kornblith points out, however, that empirical researchers have found distinct evidence that the human co-variation recognition mechanism is unreliable. It appears that we "see" co-variation where we expect to see it. Conversely, if there is no theory to lead us to expect co-variation, or if our theory would lead us not to expect co-variation, "even powerful empirical relationships are apt not to be detected or to be radically underestimated." (13) Only if the degree of co-variation is very high will humans detect co-variation.

However, Kornblith points out, there are problems with determining what these empirical studies mean for our cognitive abilities. In the studies done on detecting co-variation in the absence of antecedent theory, the co-variation was between a single pair of variables. But with natural kinds, a large number of properties co-vary together. This multiple co-variation may provide convergent evidence upon which to recognize co-variation. Indeed, empirical studies give evidence that we can reliably detect co-variation, when clusters of variables or properties covary together. But these are precisely the patterns of covariation which natural kinds display. Hence, when our covariation recognizing mechanism functions in the environment for which it was designed, there appears to be good evidence that it is reliable. It is only when it is placed in the wrong environment that its reliability becomes questionable.

What may we say to the objection that we tend to see co-variations which are not present based on antecedent expectations? Kornblith believes we should see this in the wider context of the human tendency for belief perseverance. Humans tend to hold onto their beliefs when once formed. Although this might lead one to retain mistaken beliefs in certain contexts, it can also lead to insight in others, in particular those involving co-variation within natural kinds. So again in an environment presenting us with natural kinds, even if our mechanism for recognizing co-variation builds in antecedent expectations of co-variation, these may be insightful and so our mechanism reliable.

Do we project the right features of natural kinds, the essential properties of the kind? Humans believe that natural kinds are understood through underlying structure. Hence they are already looking in the right direction. Insofar as we correctly identify what those underlying properties are, we shall make correct projections. But insofar as we are sensitive to co-variation, our knowledge of the essence will be accurate. But we have already argued that our sensitivity to co-variation is presumptively reliable. Hence there is a presumption that we *do* project the right features of natural kinds, "we typically project the properties of natural kinds which are universally shared by their members." (14) Hence we may conclude that this projection mechanism is presumptively reliable.

What import does this have for assessing the presumptive reliability of rational intuition as a mechanism for generating basic beliefs? Kornblith argues for the reliability of certain inductive inferences. How we may apply these considerations on the reliability of *inference* to the question of the presumptive reliability of rational intuition as a basic *belief*-generating mechanism? By rational intuition we apprehend the connection between something's being of a certain kind and its possessing certain properties. By apprehending this connection, we make the inference from something's being of a certain kind or its possessing certain properties in the homeostatic property cluster to its possessing these further properties. But, as Peirce has pointed out, our inferences are guided by habits of thought. When expressed propositionally, these habits of thought are the leading principles of our inferences. (15) Because we can reliably detect co-variation and project accordingly our inference is reliable. Hence the habit of thought instanced by this inference is verisimilitudinous. The mechanism generating the belief in the leading principle of this inference makes explicit this inference habit. So if our projection of co-variation is reliable, our belief-generating mechanism should be reliable also. The belief it generates is the propositional formulation of a reliable inference habit. So our rational intuition is reliable in the generation of beliefs which are leading principles of inferences instancing projection of co-variation.

Our argument shows something more general. We have seen that the clustering of properties aids in detecting co-variation. But we have also seen that if in fact there is a very high objective correlation (near perfect) between two variables, we may reliably detect it. This indicates that we can generalize beyond the context of natural kinds and co-variation occurring within that context. But furthermore, our discussion of psychological essentialism indicates that we may distinguish in general between accidental and nomic universality. If we can distinguish between surface and deeper properties, we can also distinguish between accidental or surface co-variation and deeper, essential, or nomic co-variation. Now if on the basis of observing a sample — in general small — of some class and on that basis intuiting a nomic connection between certain properties exhibited by the members of that class, we may call the subjunctive conditional expressing or supported by the nomic generalization stating this connection an empirical subjunctive conditional. What we believe our argument shows is that rational intuition is presumptively reliable in generating certain basic beliefs properly expressed as empirical subjunctive conditionals. This includes the class of subjunctive conditionals expressing connections involved with natural kinds, but it clearly may be a wider class.

## Notes

- (1) Randall, p. 42.
- (2) Randall, p. 46.
- (3) Randall, p. 44.
- (4) Aristotle, *Posterior Analytics* (trans. G.R.G. Mure), *The Basic Works of Aristotle*, ed. Richard McKeon (New York: Random House, 1941), II, 19, 100<sup>a</sup> 5, 6.
- (5) Wesley Salmon, "Why Ask, 'Why?'" *An Inquiry Concerning Scientific Explanation*, *Scientific Knowledge* ed. Janet A. Kourany (Belmont, CA: Wadsworth Publishing Company, 1987), p. 53.
- (6) Salmon, p. 53.
- (7) Salmon, p. 55.
- (8) Kornblith, p. 42.
- (9) Kornblith, p. 95.
- (10) Compare Kornblith, p. 93. "If we are sensitive to the situations in which a population is uniform with respect to some property, then making inferences on the basis of very small samples will be a reliable and efficient way to gain information about a population."
- (11) Kornblith, p. 95.
- (12) Kornblith, p. 95.
- (13) Nisbett and Ross, p. 10; quoted in Kornblith, p. 96.
- (14) Kornblith, p. 107.
- (15) See Peirce, p. 130.