

The Problem of Example

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Abstract: According to Schollmeier, for Aristotle, there are two kinds of induction: a theoretical kind, i.e., induction, and a practical kind, i.e., example (see *Pr An* 2. 23 and 24). Schollmeier aims to show that theoretical induction is not susceptible to the problem of induction, but practical induction is. The reason for this problem lies in the different kinds of preexistent knowledge required for each kind of induction. Induction proper rests on preexistent knowledge of particular species; example rests on preexistent knowledge of individuals. Each kind of induction requires the convertibility of two terms for it to work: The conversion in induction can be perfect because the number of particular species is finite; but the conversion in example cannot be perfect since it concerns individuals, and their number can be infinitely large. Thus, the problem of induction is inescapable in the case of example but not in the case of induction. Schollmeier then draws several parallels between Aristotle's problem of example and Hume's problem of induction to further prove his point. He concludes that Aristotle's logical analysis of induction (in *Pr An* 2. 23 and 24) shows that induction is empirical only in the sense that it concerns intelligible universals (particular species) acquired through sensation. It is not empirical in the sense that it concerns sensible individuals. Example does concern sensible individuals, hence, the problem of example.

Introduction

The very opening sentence of the *Posterior Analytics*¹ poses a problem for a contemporary theory of induction. This sentence is no doubt a puzzlement not only for most students but also for many professors. Recall what

¹ The editions of Aristotle followed are *Analytica Priora et Posteriora*, ed. W.D. Ross (Clarendon Press, 1964); *Ars Rhetorica*, ed. W.D. Ross (Clarendon Press, 1959); *Ethica Nicomachea*, ed. I. Bywater (Clarendon Press, 1894); *Topica et Sophistici Elenchi*, ed. W.D. Ross (Clarendon Press, 1958); and *The Basic Works of Aristotle*, ed. Richard McKeon (Random House, 2001).

Aristotle says. “All knowledge acquired through instruction (*didaskalia*) or through reflection (*mathēsis dianoētikē*),” he states, “comes to be from preexistent knowledge (*ek prouparchousēs ... gnōseōs*)”.²

We are today accustomed to think that knowledge can come to be through instruction. Indeed, philosophy professors occupy positions that depend on this very presumption. But we are not at all accustomed to think that any knowledge comes to be through reflection. We reflect merely on what we already know, do we not? Nor are we entirely comfortable with the thought that knowledge can arise from preexistent knowledge. Surely, all knowledge arises from sensation.

What no doubt adds to our initial uneasiness are the proofs that Aristotle educes for his assertion. Among them we find the argument that both induction and deduction proceed in this way. That arguments of both kinds instruct us from what we already know, he asserts explicitly. Through syllogisms (*dia sullogismōn*), apparently deductive, we grasp knowledge from what we understand, and through induction (*di' epagōgēs*) we show a universal through a clear particular, presumably known.³ We can probably concede that deduction arises from knowledge that we already have. But we would likely contend that induction, and ultimately deduction, arise only from particulars that we sense. Nor are these sensed particulars entirely clear.

Aristotle continues to imply, oddly enough, that rhetoric produces persuasion in a similar manner. Rhetorical arguments work through enthymemes (*di' enthymematōn*), which are deductive, and through examples (*dia paradeigmatōn*), which are inductive, he informs us.⁴ The implication is that an enthymeme arises from knowledge that we already have, and that an example establishes a universal through a known particular. But we might well wonder whether rhetoric could actually produce any knowledge worthy of the name. And, again, would not a rhetorical particular be one that we sense?

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Our present interest in this opening assertion and its supplementary arguments concerns induction. I wish to pose the obvious question, What is induction? But other questions follow quickly on its heels. Does induction produce new knowledge from preexistent knowledge? Aristotle would

² *Posterior Analytics [Post An]* 1. 1. 71a1-2.

³ *Post An* 1. 1. 71a5-9.

⁴ *Post An* 1. 1. 71b9-11.

imply that it does. An induction somehow shows a universal through a known particular.

Another question I wish to pose is, What is example? Aristotle implies that an example is an induction, too. But an example does not seem to be a philosophical argument. It is rarely analyzed outside of an introductory textbook on what we call critical thinking. Yet example is somehow philosophical. We frequently use examples in professional discourse. Today we have a particular penchant for contrary-to-fact counterexamples.

Our question about induction is, therefore, complex. Its complexity rests on a presupposition. Knowledge for Aristotle, and for us if we deign to reflect on the matter, is of two kinds. “Knowledge” is a homonymic genus, in other words. The genus knowledge includes as its species what we might call knowledge proper, which is theoretical, and what we call belief or opinion, which is practical. Today we tend to think that knowledge proper is not really knowledge, and, curiously, we usually take opinion to be knowledge proper!

Because knowledge is of two kinds, induction, I would think, is also of two kinds. If so, we may view “induction” as a homonymic genus. This genus would include both induction proper, which concerns knowledge, and example, which concerns opinion. Induction proper is a logical technique, but example, we shall see, is a rhetorical technique. These techniques for Aristotle have their similarities, but they also have their dissimilarities. Their dissimilarities are not insignificant.

Of course, if we have knowledge of two kinds, we would also have preexistent knowledge of two kinds. If, that is, we may claim with Aristotle that we can actually acquire any knowledge through preexistent knowledge. If we do so acquire knowledge, then our inductions, theoretical or practical, would arise, presumably, from knowledge, theoretical or practical, that is somehow preexistent.

With my analysis I shall show that problem of induction is actually a misnomer. My title is meant to suggest that it is. The problem of induction, so-called, is, I propose to argue, the problem of example. We have confused the logical technique with the rhetorical, and we have taken the rhetorical technique for the logical! The error, in modern times at least, would appear to have arisen, unfortunately, with the British empiricists. I shall take David Hume as paradigmatic though others would do as well.

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I would now examine a presupposition. If we have knowledge of two kinds, do we not require intellectual faculties of two kinds? And do not our intellectual faculties concern objects of two kinds? That is to say, I shall assume with Aristotle that our different faculties have different objects, even our intellectual faculties. This assumption many other philosophers share though not all do so wittingly.

In the *Nicomachean Ethics* Aristotle acknowledges that our intellect divides into two faculties. He explicitly does so on the grounds that our soul has different parts, and that these different parts concern different objects.⁵ The faculties into which he divides the intellectual part of our soul are, he argues, a scientific faculty and a calculative faculty.⁶ Our scientific faculty concerns “things of which the principles cannot be other than they are,” and our calculative faculty concerns “things that can be other than they are”.⁷

Our scientific faculty I take to concern knowledge, and our calculative faculty to concern opinion. Knowledge includes theoretical intuition and demonstration, Aristotle argues, and these intellectual virtues both concern objects that cannot be otherwise. That is, their objects are universal and necessary.⁸ Opinion includes practical intuition and deliberation, and these virtues concern what can be otherwise.⁹ Knowledge of the practical variety, he explicitly asserts, is opinion.¹⁰

This distinction, we might note, is not unknown to modern philosophers. David Hume, despite his differences, acknowledges the distinction, if implicitly, when he discusses human reasoning and its objects. The objects of human reasoning, he asserts, are relations of ideas and matters of fact. Our reasoning about relations of ideas, he implies, rests solely on the principle of contradiction, but reasoning about matters of fact requires another principle, which turns out to be association.¹¹

⁵ *Nicomachean Ethics* [NE] 6. 1. 1139a8-11.

⁶ NE 6. 1. 1139a11-12.

⁷ NE 6. 1. 1139a6-8.

⁸ NE 6. 3. 1139b18-24; 6. 6. 1140b33-1141a8.

⁹ NE 6. 5. 1140a24-1140b7; 6. 11. 1143b35-1144a5.

¹⁰ NE 6. 5. 1140b25-28.

¹¹ Hume, David, *Enquiries concerning Human Understanding and concerning the Principles of Morals*, 2nd ed, eds. L.A. Selby-Bigge & P.H. Nidditch (Clarendon Press, 1978), 4. 1. 25-26; 5. 1. 41-42.

3

Our knowledge for Aristotle, then, is of two kinds. Or, at least, I shall so assume. That induction for Aristotle is also of two kinds, I shall now argue. The one kind, induction proper, leads us to logical principles, which are theoretical, and the other kind, example, takes us to rhetorical principles, which are practical.

What is induction of the theoretical kind? Induction, Aristotle tells us, proves that one extreme term belongs to a middle term by means of another extreme term. More specifically he explains that induction shows that a major term belongs to a middle term by means of a minor term. His example is well known. If man, horse, and mule, say, are bileless, and if man, horse, and mule are long-lived, then induction shows that all bileless animals are long-lived.¹²

A theoretical induction turns on an assumption of convertibility. This convertibility is of the minor and the middle terms. Convertibility of these terms is possible, Aristotle explains, if the middle term is not wider than the minor, and if the minor term includes all the particulars.¹³ The resulting conversion in his example is that all the bileless animals are either man, horse, or mule. We thus have a deductive syllogism: All bileless animals are man, horse, and mule; man, horse, and mule all are long-lived; therefore, all bileless animals are long-lived.

We now see what preexistent knowledge that induction requires. The preexistent knowledge required for an induction is our knowledge of the species under consideration. This knowledge, Aristotle states explicitly, must be of all the particulars.¹⁴ In his example the preexistent knowledge is that man, horse, and mule are long-lived, and that man, horse, and mule are bileless. These species are the most particular species within a genus. They are what we may handily call in scholastic parlance the *infimae* species.

Please notice that knowledge of the *infimae* species is not knowledge of individuals. Our knowledge of any species is for Aristotle knowledge proper. If we know a species, we know that which cannot be other than it is. A species is a universal and necessary object. But we know an individual only in the sense that we have an opinion about it. An individual can obviously be other than it is. An individual is a contingent and particular object.

¹² *Prior Analytics [Pr An] 2. 23. 68b15-23.*

¹³ *Pr An 2. 23. 68b23-27.*

¹⁴ *Pr An 2. 23. 68b26-28.*

An induction for Aristotle arises not from the individual instances of a species, then, but from the species themselves. Induction goes from lower species to higher species, which are their genera. An induction, please note, does not require that we enumerate all the individuals. If I am right, induction does not require that we enumerate any individuals.

Aristotle can thus argue, I think, that induction is about universals that we already know. He argues, after all, that induction, as does deduction, proceeds from preexistent knowledge. This preexistence knowledge, I am arguing, is knowledge of infimae species.

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But a contemporary reader is bound to ask, Whence our knowledge of infimae species for an induction? Does our knowledge of species not arise from sensation? Aristotle rests his epistemology on psychology. He sets out his position in a passage no doubt familiar. Our mind is so constituted that from sense perceptions arise memories, and from memories arise experiences, which are universals within our soul. And our universals, he explains, furnish first principles for both art and science.¹⁵

But this psychology hardly seems sufficient. Our preexistent knowledge of universals would seem to be a less than adequate basis for a science. Where does our knowledge of this sort come from? It would appear simply to pop into our heads. Science for Aristotle does not even constitute an observational science, let alone an experimental science. It does not rest on any empirical observation at all, apparently.

Aristotle would no doubt reply quite simply that he is analyzing science only of a kind acquired through instruction or through reflection. Remember the first puzzling sentence of the *Posterior Analytics*? This is armchair science at its finest! It is empirical science only in the sense that its objects are universals acquired through sensation. It is not empirical science in the sense that its objects are sensible individuals.

5

What, then, is practical induction for Aristotle? A practical induction is an example. An example, Aristotle argues, proves the major term to belong to the middle by means of a term resembling the minor term.¹⁶ To prove that a war against a neighbor is evil, we can show that a war, say, against the

¹⁵ *Post An* 2. 19. 99b34-100a9.

¹⁶ *Pr An* 2. 24. 68b38-39.

Phocians was a war against a neighbor and was evil.¹⁷ The resembling term is the Phocian war, war against a neighbor is the middle, and evil is the major. We may, he observes, use several instances to show that a war against a neighbor is evil.¹⁸

Why does Aristotle say that we prove the major to belong to the middle term by a term resembling the minor? Do we not do so by means of the minor itself? The fact is that we often use an example to apply its inductive conclusion to a new particular. If we know that a war against Thebans, say, is a war against a neighbor, we may wish to know whether it would be a good thing or a bad thing to undertake. By taking the Phocian war as an example, we can establish our major premise, that a war against a neighbor is bad, and then easily apply the major term to the minor.¹⁹

Aristotle briefly discusses convertibility and example. He remarks explicitly that example, unlike induction, does not draw its proof from all the particulars.²⁰ Yet we can see that the minor and middle terms must be convertible. Otherwise, we would have not a deductive syllogism. The minor premise resulting from the conversion is that a war against a neighbor was the Phocian war. The syllogism resulting from the conversion would be: A war against a neighbor was the Phocian war; the Phocian war was evil; therefore, a war with a neighbor is evil.

What is the preexistent knowledge that example requires? Example requires knowledge of individuals that are sensible. Or, more precisely, it requires opinion about sensible individuals. We must have an opinion, to continue with our example, about one or more past wars against neighbors, and our opinion must be that these wars turned out badly. Otherwise, we would have no minor terms upon which to base our proof that a war against a neighbor is evil.

Notice, too, that example yields not a theoretical but a practical principle. A general occupied with military affairs, for example, does not have the leisure to work out a theory of warfare. His concern is with present exigencies. Should he go to war with his neighbor? He obviously does not concern himself about universals but about individuals. No one, Aristotle remarks, deliberates about that which cannot be other than it is.²¹

¹⁷ *Pr An* 2. 24. 69a4-7.

¹⁸ *Pr An* 2. 24. 69a11-13.

¹⁹ *Pr An* 2. 24. 68b41-69a4, 69a7-11.

²⁰ *Pr An* 2. 24. 69a19.

²¹ *NE* 6. 2. 1139a13-14.

We can now see what the problem of example is. The conversion in induction and the conversion in example differ significantly. The conversion in induction can be perfect. Why? The number of infimae species is finite. The number in some genera may be large, but their number is a definite one. The conversion in example cannot be perfect. Example concerns individuals, after all. Their number can be and often is very large indeed. It would be indefinitely large if not infinitely large.

But you may object, does not an example lead us to a universal? In our present example, the universal would be that to wage war against a neighbor is a bad thing. My response is that this proposition is not a universal proper, but that it is what we ought rather to call an empirical generalization. A universal of this kind constitutes not knowledge but opinion. It concerns individuals in innumerable number.

Aristotle recognizes this philosophical difference. He explicitly argues that we may either know or opine a general proposition. If we have knowledge, we grasp a truth as not capable of being other than it is, but we grasp a truth as capable of being other than it is if we have opinion.²² We may, he explains, view our humanity either as incapable of being other than animal or as capable of being other than animal.²³

6

One might wonder, does Aristotle offer any psychology to account for example? He does, we have seen, take up the epistemological psychology of induction in the *Posterior Analytics*. Unfortunately, he does not, as far as I know, in his logical treatises or in his rhetorical treatise discuss an epistemological psychology for example. He does, however, extend his analysis of example in the *Rhetoric*, and his extended analysis points the way toward an implicit psychology.

I would note that rhetoric clearly concerns the same ontology that example concerns. Rhetoric, Aristotle argues, concerns things that we deliberate about.²⁴ But we do not deliberate about things that cannot be otherwise. We deliberate, he states literally, about things that “can turn out either way”.²⁵

He argues that rhetoric offers arguments of two kinds about these contingent things. These arguments we have already encountered. They are

²² *Post An* 1. 33. 89a16-21.

²³ *Post An* 1. 33. 89a33-37.

²⁴ *Rhetoric [Rhet]*, 1. 2. 1357a1- 2.

²⁵ *Rhet* 1. 2. 1357a4-7.

enthymeme, which is deductive, and example, which is inductive.²⁶ Both enthymeme and example, he asserts more explicitly, concern “things that can be other than they are,” though some of these are necessary. These contingent things, he explains, are both probabilities and signs, and some signs are necessary.²⁷

In the *Rhetoric* Aristotle also recognizes examples of three kinds. He divides these kinds into examples of things that have happened before or examples that are made up.²⁸ Examples of things that have happened are the more pertinent for our purpose. These examples must clearly rest on preexistent knowledge, or rather opinion, about the past.²⁹ These examples are the more useful, he observes, because the future for the most part resembles the past.³⁰

Made up examples he subdivides into fables and parables. Fables, he explains, would include animal stories, such as those of Aesop.³¹ Parables include the arguments of Socrates.³² I would presume that fables and parables also require preexistent opinion on which to base their inferences. He argues only that we can easily invent parables and fables if we can see the similarities between things, which we learn from philosophy.³³

7

We can now see what psychology Aristotle has to offer for example. He appears, at least, to discuss a psychology appropriate to historical examples in the short treatise *On Memory and Recollection*. What we shall discover is that Aristotle has a theory of association, and that his theory can explain how we form inferences with examples taken from the past.³⁴

²⁶ *Rhet* 1. 2. 1356a35-1356b6.

²⁷ *Rhet* 1. 2. 1357a22-1357b10.

²⁸ *Rhet* 2. 20. 1393a28-30.

²⁹ *Rhet* 2. 20. 1393a32-1393b4.

³⁰ *Rhet* 2. 20. 1394a6-8.

³¹ *Rhet* 2. 20. 1393a30-31, 1393b8-1394a1.

³² *Rhet* 2. 20. 1393b4-8.

³³ *Rhet* 2. 20. 1394a3-5.

³⁴ Samuel Taylor Coleridge drew my attention to this little treatise. But Coleridge does not see a connection to rhetoric or to example (Samuel Taylor Coleridge, *Biographia Literaria*, ed. George Watson (E.P. Dutton & Co., 1975), 5. 60; cited recently by White and Macierowski, *Commentaries on Aristotle's On Sense and What is Sensed and on Memory and Recollection*, eds. Kevin White & Edward M. Macierowski (The Catholic University of America Press, 2005), v).

Our concern is not with memory but with recollection. Aristotle states that, when we recollect, one psychological motion naturally comes to be after another.³⁵ Recollection, he continues, can proceed either by necessity or by habit! By necessity one motion will, presumably always, lead to another. By habit one motion will lead to another “for the most part”.³⁶ That we recollect knowledge proper by necessity, and by habit we recollect opinion, I shall assume.³⁷

We are concerned with recollection of opinion, of course. What happens, Aristotle explains, is that one psychological motion leads to another motion, and these motions become a habit.³⁸ When we recollect, we first feel one mental motion, and then we feel another motion after it. We can in this way recollect by thinking now from one motion similar to, contrary to, or contiguous with the motion sought!³⁹

Aristotle explains further that our mental habits can become natural. We remember more quickly that which we more frequently think about. This psychological process rests on an assumption that motions in our mind and motions in nature follow similar paths.⁴⁰ But he points out that, as an extraneous thing can divert the usual course of nature, so an extraneous thing can also divert our mind from its recollection.⁴¹

Similarity would obviously be the most important quality for the recollection of an example. Recall that an example proves a major term to belong to a middle term by a term resembling the minor. Consider Aristotle’s example again. If we wish to know whether a war with our neighbor is good or bad, we ought to recall other past wars with neighbors, and recall whether they were good or bad.

That fables and parables also rest on similarity, we can without difficulty see. We can, Aristotle argues, better make up fables if we see the similarities between things.⁴² Fables about animals, for example, rest on similarities between animals and their situations and ourselves and our

³⁵ *On Memory and Recollection [Memory] 2.* 451b10-11; 451b22-25.

³⁶ *Memory 2.* 51b10-14.

³⁷ But see *Memory 2.* 452a2-4.

³⁸ *Memory 2.* 451b14-16, 451b28-29.

³⁹ *Memory 2.* 451b16-22.

⁴⁰ *Memory 2.* 452a26-30; 451b31-452a1.

⁴¹ *Memory 2.* 452a30-452b7.

⁴² *Rhet 2.* 20. 1394a3-5.

situations.⁴³ Parables turn on more general similarities between different subject areas.⁴⁴

8

Aristotle briefly discusses a method for recollection. His method lends itself to an analysis similar to example. He argues that we ought to start with a universal principle that is a middle term.⁴⁵ From a middle term we can proceed to its minor terms or to its major term, he implies. His argument is schematic. From the middle term C one might recollect the minor terms F or G. Or from the middle H one might recollect the minors D or E. One might also recollect from the middle terms C or H the major term A.⁴⁶

His analysis of example in the *Prior Analytics* can serve to illustrate his schematic argument. We might, for example, recollect from the middle term to a minor term. From war against a neighbor we can recollect the Phocian war or the Theban war. Or we might recollect from the middle term to the major. From a war against a neighbor we can recollect evil.

Aristotle explicitly concludes that recollection is not memory because recollection is a syllogism of a certain kind. One who recollects, he states, is syllogizing and inquiring.⁴⁷ Might he not have in mind a syllogism of the kind that rhetoric employs, especially argument by example? He adds that animals that can recollect have a faculty of deliberation because deliberation is a syllogism of a certain kind.⁴⁸ I would add that animals with a deliberative faculty can employ rhetoric in their deliberations.⁴⁹

We have, then, confirmed our inference that we can acquire knowledge of more than one kind from preexistent knowledge of more than one kind. Our preexistent knowledge can be either knowledge proper or opinion. That is, it can be either theoretical or practical knowledge.

⁴³ see *Rhet* 2. 20. 1393b8-1394a1.

⁴⁴ see *Rhet* 2. 20. 1393b4-8.

⁴⁵ *Memory* 2. 452a17-19; also 451b29-452a2; 452a12.

⁴⁶ *Memory* 2. 452a19-24. Aquinas suggests this interpretation with a diagram of recollection (*Commentaries* 6. 220). But he does not see a connection with the middle term of example. He appears to view the middle term as useful for an association less disciplined (219-220). Unfortunately, David Ross in his commentary makes a number of emendations to the text, and these emendations would undermine this interpretation. He would make recollection rest primarily on association not by similarity but by contiguity (*Naturalia* 241, 247-248).

⁴⁷ *Memory* 2. 453a6-10.

⁴⁸ *Memory* 2. 453a12-14.

⁴⁹ *Rhet* 1. 2. 1357a1-7, e.g.

Induction rests on preexistence knowledge of infimae species, but example rests on preexistent opinion about individuals.

Our preexistent knowledge depends on objects of different epistemological and ontological status. Induction, recall, concerns knowledge about universals, which are eternal and necessary. They are principles that cannot be other than they are. Example concerns opinion about individuals, which are decidedly contingent and temporary. They are what can be other than they are.

9

can now show you, if you have not already divined it, why the so-called problem of induction is actually the problem of example. The conventional wisdom is that the problem of induction originated with David Hume. Let us see what Hume tells us about induction. Unfortunately, we immediately find ourselves somewhat disadvantaged by his discussion. Hume fails to use the term induction in any philosophical sense, and he does not offer a logical analysis of the technique.⁵⁰

We can see, nonetheless, that for Hume any problem of induction clearly could not be a problem concerned with knowledge but a problem concerned with opinion. Recall how Hume divides the objects of human reason into relations of ideas and matters of fact. His concern is not with relations of ideas but with matters of fact. Relations of ideas, he all but explicitly asserts, we can discover by reflection or instruction! Explicitly he asserts that they are discoverable “by the mere operation of thought”.⁵¹

He also indicates that relations of ideas rest on the principle of contradiction. Their contraries, he implies, would be self-contradictory. Our mind cannot conceive them with any clarity.⁵² Nor are these relations dependent on any existent object. Euclidean geometry would remain certain even if no circle or triangle ever existed in nature, he explains.⁵³

⁵⁰ Electronic searches of online editions show that Hume does not use the term “induction” even once in the *Enquiry concerning Human Understanding*. He uses the term only twice in *A Treatise of Human Nature*, but he uses it in an ordinary, not a philosophical, sense (*Treatise* 1. 2. 1. 26-27; App. 628-629). Nor does Hume use the term “example” in the *Enquiry*. He does use the term seven times in the *Treatise*, but he, again, uses it always in an ordinary, pedestrian, sense (e.g., *Treatise* 1. 4. 7. 273-274; 3. 2. 2. 497-498; or 3. 2. 5. 519-521).

⁵¹ *Enquiry* 4. 1. 24.

⁵² *Enquiry* 4. 1. 25-26.

⁵³ *Enquiry* 4. 1. 25.

But matters of fact we can never discover by the operation of thought alone. We know matters of fact by cause and effect, and cause and effect we know by experience only.⁵⁴ Matters of fact also have contraries that are not self-contradictory, and the mind can clearly conceive them. That the sun will not rise tomorrow, is a proposition quite intelligible.⁵⁵ That the sun exists in nature, Hume does not bother to assert.

We find, then, an echo in our modern philosopher of the ancient distinction between knowledge and opinion. Human reason according to Hume has two distinct objects. Relations of ideas cannot be other than they are, we might say. Their contraries imply a contradiction, and they are inconceivable. Matters of fact can be other than they are. Their contraries are quite conceivable and imply no contradiction.

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What is the so-called problem of induction, then? The problem for Hume, if he thought it the problem of induction, obviously does not concern knowledge proper and its object but rather opinion and its object. Hume explicitly inquires not after a principle for relations of ideas but after a principle for matters of fact. Relations of ideas rest on the principle of contradiction, he assumes. But on what principle do matters of fact rest? he asks.⁵⁶

Hume, indeed, shows why our beliefs about factual matters, and our inductive beliefs in particular, cannot constitute knowledge. We can have no intuitions with which to construct demonstrations, he argues. He denies in effect that universals can exist in nature. Or, rather, that we can know them to exist in nature. Nature withholds “all her secrets” from us, and keeps her powers concealed, he explains. She reveals to us only “a few superficial qualities of objects.” These qualities we are aware of through sensation only.⁵⁷

We consequently cannot discover a middle term, which Hume calls a medium, for a demonstration.⁵⁸ If we could discover a middle term, we would be able to form a demonstrative syllogism. But we cannot know by what secret power bread nourishes, for example.⁵⁹ If we did, we would know a connection between the observed qualities of bread and the enjoyed

⁵⁴ *Enquiry* 4. 1. 26-30.

⁵⁵ *Enquiry* 4. 1. 24-25.

⁵⁶ *Enquiry* 4. 1. 26; 5. 1. 41-42.

⁵⁷ *Enquiry* 4. 2. 32-33.

⁵⁸ *Enquiry* 4. 2. 34, 36-37.

⁵⁹ *Enquiry* 4. 2. 33, 37.

qualities of nourishment. Our demonstration would be: bread has this power, this power nourishes, therefore, bread nourishes.

We again see that the problem of induction, so-called, must concern matters of fact. Should you still harbor a doubt, Hume reminds us that without any contradiction the course of nature can change. May I not conceive, he asks, that a body resembling snow in all other respects might yet have the feeling of fire or the taste of salt?⁶⁰ Matters of fact, in other words, can be other than they are.

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We might now ask, Does Hume show that our reasoning concerned with matters of fact takes a form similar to example? Unfortunately, Hume does not present a syllogistic analysis for his solution to what he calls his skeptical doubts. But from what he does say about his doubts we can with little difficulty construct a formal analysis of his solution, and the analysis so constructed turns out to be identical to the formal analysis of example.

Hume asks in effect how we can show that a major term belongs to a middle term by means of a term resembling the minor! To continue with his example, How do we know that bread nourishes? We can show that this loaf was bread, and that this loaf nourished us.⁶¹ The resembling term is this loaf; the middle term is bread; the major is nourished us. He tacitly assumes that we may use several instances to show that bread nourished.

He is particularly concerned to show that we may apply our major premise to a new minor term. How, he asks, can we show that bread will nourish us in the future? He shows that we can apply the major term to a new minor term by means of the middle term. By taking this loaf as our example, and perhaps other loaves as well, we can establish a major premise, that bread nourishes us, and we can apply the major term to the new minor. We conclude that the loaf in question will also nourish us.

What many philosophers take to be the problem of induction concerns the convertibility of the minor and middle terms. Without their convertibility we cannot apply the major term to the new minor. The minor premise resulting from the conversion would be that bread included these loaves. The requisite syllogism resulting from the conversion would be: Bread included these loaves; these loaves nourished; therefore, bread nourishes.

⁶⁰ *Enquiry* 4. 2. 35.

⁶¹ *Enquiry* 4. 2. 33, 37.

But the minor terms and the middle term are not perfectly convertible. Hume is at pains to point out that we cannot know the minor term in all its instances. We have experience only of the past instances, and we do not know all the past instances. Nor are the past instances, even if we knew them all, exhaustive. The presumed instances of the future also remain unknown.⁶² What is more, Hume kindly reminds us that the past instances need not resemble the future instances.⁶³

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Hume, then, is concerned with what I call the problem of example. He is concerned with opinion and its object. Or, he himself would say, with belief and matters of fact. His question, then, is, How can we come to a conclusion about a future particular if our awareness of past particulars is not exhaustive? Put in other terms, How can we induce a general proposition and apply our proposition to a new particular if matters of fact can be other than they are?

He famously finds his answer in his epistemological psychology. He argues that habit carries us from past particulars to a future particular! The observation of past particulars occasions a mental habit, and this habit impels our thought toward a new particular. The repetition of an activity produces a propensity to renew the activity, and this propensity is the result of custom, he argues.⁶⁴ After observing, for example, loaf after loaf to be bread and to nourish, we cannot but expect a future loaf to be bread and to nourish.

Hume offers a psychology uncannily similar to the Aristotelian. His psychology would even appear to allow, albeit implicitly, for matter of fact reasoning by example of three kinds. He clearly admits of historical reasoning by example. He calls reasoning of this kind probability of cause. When events are not entirely uniform, we favor those past events found to be the most usual, he argues.⁶⁵ His example of bread concerns memories about past instances of eating bread and of being nourished.

But he also allows for matter of fact reasoning that we make up. Reasoning of this kind he calls probability of chance. He does not give any examples of animal fables. But consider his example of a die. If a six-sided die has one number on four sides and another number on two sides, we can

⁶² *Enquiry* 4. 2. 33-34.

⁶³ *Enquiry* 4. 2. 37-38.

⁶⁴ *Enquiry* 5. 1. 43-45.

⁶⁵ *Enquiry* 6. 57-59.

infer that the number on four sides is twice as likely to turn up. Why? We imagine the various outcomes of casting the die, and to those outcomes more frequent we give our assent.⁶⁶

We might even say that he allows for parables. He acknowledges that reasoning about matters of fact can concern general as well as particular facts. Reasoning concerned with general facts includes the empirical sciences, among them politics, chemistry, and physics. These sciences concern “whole species of objects”.⁶⁷

I would add that Hume and Aristotle share two similar presuppositions. Hume observes that what I call historical instances rest on the supposition that the future resembles the past.⁶⁸ He also marvels at the harmony, apparently pre-established, between the course of our ideas and the course of nature.⁶⁹

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My reader may agree that there is a general similarity between the Humeian and the Aristotelian epistemological psychology concerning matters of fact or opined things. But you might yet object that Aristotle does not mention causation when he discusses mental habit and association. He lists only resemblance, contrariety, and contiguity.⁷⁰ Nor does Hume mention association by contrariety. He lists resemblance, contiguity, and cause and effect.⁷¹

I would answer that Hume does allow for association by contrariety. He argues explicitly that one can derive contrariety from resemblance and cause and effect. His argument is terse. But its conclusion appears to be that the idea of an effect we associate by similarity with the idea of an effect not yet realized. Obviously, an effected object and an object not effected are contraries. What he states is that the cause of the annihilation of an object and the idea of its annihilation imply the idea of the object not yet annihilated.⁷²

Could Aristotle not argue, conversely, that we can derive association by cause and effect from resemblance and contrariety? The idea of an

⁶⁶ *Enquiry* 6. 56-57.

⁶⁷ *Enquiry* 12. 3. 164-165.

⁶⁸ *Enquiry* 4. 2. 35-36, 37.

⁶⁹ *Enquiry* 5. 2. 54-54. Coleridge goes so far as to claim that Hume acquired his concept of association from the commentary of Thomas Aquinas on the *Parva Naturalia*. He asserts that Hume owned a copy of the commentary, and that his copy had marginalia in his hand (*Biographia* 5. 60).

⁷⁰ *Memory* 2. 451b18-20.

⁷¹ *Enquiry* 3. 24.

⁷² *Enquiry* 3. 24. n. 4; also see *Treatise* 1. 1. 5. 15.

object and the idea of the annihilation of an object imply an idea of a cause. Assume an object, say a human being, to remain similar to itself and yet to undergo change. Allow this object to lose one contrary and to gain another, changing, say, from alive to dead or from hungry to fed. The new contrary would be an effect, obviously, and would imply a cause.

I would point out, nonetheless, that association by resemblance is sufficient for my purpose. An example concerning wars with neighbors rests on a similarity among the minor terms. A war with the Phocians and a war with the Thebans are similar in that they were wars with neighbors, and they ended badly. And so a loaf yesterday and a loaf the day before are similar in that both are bread, and both nourished.

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I now conclude. With Aristotle I recognize a logical technique that we can use to form universal propositions by going from lower to higher species, and I also recognize a rhetorical technique that we can use to form empirical generalizations by going from individuals to lower and higher generalizations. With Hume I agree that we can induce a general proposition from individual particulars. But I would argue that we can do so not by induction proper but by example, and I would claim that we can use example to arrive not at a genuine universal but only at an empirical generalization.

I concede, however, that we can take an empirical generalization for a genuine universal. That is, we can induce a major premise through example, and we can view our major premise as concerned with what cannot be otherwise and not with what can be otherwise. Aristotle recognizes explicitly this philosophical fact. We may, recall, view our humanity either as incapable of being other than animal or as capable of being other than animal.⁷³

But how do we know whether our major premise is a universal or a generalization? This question is one for dialectic and not for logic or rhetoric, Aristotle argues. Dialectic is an art that enables us to discover universal propositions. This art is useful for discovering the principles of the sciences, he explains.⁷⁴ But only through opinions we can discover these principles, he explicitly states.⁷⁵

Aristotle also asserts that rhetoric concerns propositions that do not belong to a science or an art. He cautions us that the better we select our

⁷³ see *Post An* 1. 33. 89a33-37.

⁷⁴ Aristotle, *Topics* 1. 2. 101a36-37, 101b3-4.

⁷⁵ *Topics* 1. 2. 101a37-101b2.

premises the closer we come to some other discipline.⁷⁶ He in fact observes that, if we select our premises too well, we might stumble upon a premise that is a first principle of a science. We are then engaged in science and not in rhetoric.⁷⁷

Yet I cannot myself but wonder whether these universal principles might not be empirical generalizations that we happen to think unexceptional. Hume offers, perhaps, an insight into our knowledge proper or, he would say, into our relations of ideas. Necessity Hume reduces to a psychological phenomenon. A necessary connection of cause and effect is one that in our experience admits of no exceptions.⁷⁸ Fire always burns, and water always suffocates.⁷⁹

Can we truly know any universal, then? I must admit that I have my doubts. We can enjoy when at our leisure, perhaps as a respite from our empirical travails, what might prove to be eternal and necessary truths in all their divine splendor. We do so when we indulge in instruction or in reflection on our acquired universal concepts.

But we must inexorably awaken from our divine slumbers. When we arise from our armchair or from our professorial chair, we are obliged to employ truths decidedly contingent and temporal. We do so whenever we might wish to wend our way back to the office after class, perhaps, or, if we are at home, to the fridge for a frosty beer.

Conclusion

We ought, then, to keep in mind that induction is a homonymic genus. It includes what I would call induction proper and example. Aristotle speaks of induction proper when he discusses induction, but the British empiricists speak of what Aristotle would call example when they discuss induction. Though he does not use the term, Hume clearly discusses not induction but example.

We have, further, two distinct inductive techniques, one logical and one rhetorical, and they concern objects of two kinds, one necessary and one contingent. I would suggest that we may wish to keep these two techniques and their two objects separate, and that we may find them of use for philosophical or practical purposes, which are obviously distinct.

⁷⁶ *Rhet* 1. 2. 1358a2-9.

⁷⁷ *Rhet* 1. 2. 1358a10-26.

⁷⁸ *Enquiry* 7. 2. 73-76.

⁷⁹ see *Enquiry* 6. 57.

But let us not forget preexistent knowledge. We can see that these two techniques rest on preexistent knowledge of two kinds. Induction rests on known universals, which, presumably, cannot be other than they are. These universals are the *infimae species* arising in our soul. Example rests on opined particulars, which, obviously, can be other than they are. These particulars are memories resting in our soul.

I end with a humbling question, Could we possibly know or opine anything other than the meagre furnishings of our own mind?