

# A Brief Memo to Pragmatists Concerning Induction

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Dear Pragmatists,

I have lately become interested in the problem(s) of induction. Every version of this problem boils down to asking this question, how can we ever warrant drawing a conclusion which is more general than the premises it is drawn from? For example, let us suppose that the use of the inductive method has proven very useful in the past, and we should like to know whether that method will continue to prove useful in the future. Everyone is agreed that the future may turn out to be other than we predict. Therefore, it is at least possible that induction shall someday turn out not to be a useful method of reasoning.

Now, there are those who would infer from this uncertainty concerning the future that therefore we cannot ever know in advance whether induction will continue to prove to be useful. These folks are right, but they stop short, and gain nothing for it. Who would disagree that we cannot know *now* what can only be known in the *future*?

We Pragmatists know that the only way to answer the *empirical* question of whether inductive reasoning will continue to prove useful in the future is to go out and continue to utilize inductive reasoning in order to test and see what happens. In turn, since we have a strongly vested interest in answering this particular question, then this gives us sufficient reason to continue utilizing inductive reasoning. Ironically, this entails that we Pragmatists, of all people, can actually provide rational warrant for utilizing inductive reasoning, at least for now.

But we have misunderstood the real concern, our interlocutors might protest. We are not merely interested in the empirical question of whether inductive reasoning will continue to be useful in the future, what we are really after is an explanation for *why* it

proves useful when it does. What is it about inductive reasoning which allows us to successfully engage in certain tasks?

Now that sounds like a great question! But we Pragmatists shall need some more details about the particular tasks our interlocutors have in mind. Are we supposed to be thinking about how scientists variously use inductive reasoning? Or are we thinking about how sommeliers and perfumers use inductive reasoning? Or do our interlocutors have something else in mind altogether? If we want to learn more about *why* a given use of inductive reasoning is useful, we shall need to be more specific about the use or uses that we are interested in.

Take sommeliers and perfumers, for instance. Both of these professions require their trainees to memorize a system of inductive generalizations, or categories, which can be used to narrow in on the identity of a given unknown sample by way of eliminating alternative possibilities. For sommeliers, it is well known that all younger wines stored in corked bottles will tend to have fruitier aromas and feel less smooth than their more mature counterparts, all else being equal. These are two widely used inductive generalizations which are partially grounded in our scientific understanding of the aging process for wines stored in corked bottles. But they are also partially grounded in each individual sommelier's personal experience with sampling a variety of vintages of all ages. What it means for a given wine to smell "fruity" to *me*, in my own circumstances, is not going to be the same as what it means for that wine to smell "fruity" to *you*, in your own circumstances. For we know enough about olfactory perception to be able to say that there is no one-to-one mapping between the chemical properties of odorants and the neural

dynamics which they trigger. The scientific evidence we have for thinking that the aging process will tend to make a vintage smell more savory, spicy, and/or earthy over time, in addition to feeling smoother, is corroborated by an entire profession of individuals who can each attest to having subjectively experienced these things to generally be the case across a very large number of sampled vintages. Nevertheless, insofar as these generalizations are held by each sommelier to apply to all wines, again, *ceteris paribus*, which are within their specific domain of expertise, they remain inductive generalizations in the fullest sense. These categories are formed by drawing conclusions which are more general than the premises they are drawn from. Yet every day sommeliers continue to utilize these inductive generalizations to successfully identify either what a given wine actually is, or at least what wine a given sample most smells, tastes, looks and feels like. This raises the question of why does this utilization of inductive reasoning seem to work so well?

To answer this question, we must first realize that these generalizations are not wielded about by sommeliers like timeless truths which admit of no exceptions. They are utilized tentatively, provisionally, like guiding rules of thumb. Suppose I am sampling an unknown wine, and it smells fruity, like it could be a younger vintage. Before I can safely conclude that it *is* a younger vintage, I must rule out alternative explanations by ruling out possible exceptions to the generalization I am thinking about applying. The way to do this is to appeal to *countervailing* generalizations. Suppose that the fact that the wine smells quite fruity could also be explained by X, Y, or Z. According to my generalization concerning X, I should expect to observe A if X is the case. Yet I am not observing A in this wine. Therefore, X cannot be the case. Similarly with Y. If Y is the case, I should expect to

observe B, which I am also not observing. Therefore, Y cannot be the case either. With Z, however, my generalization does stipulate that I should expect to observe C if Z is the case, and let us suppose that I am in fact observing C. Yet we might further suppose that my generalization concerning Z also stipulates that I should not expect to observe D, which I am observing. Therefore, even though I am observing C, it follows from my also observing D that Z cannot explain why this wine smells fruity to me. And in the absence of any further alternative explanations, I take myself to be safe to conclude that this fruity aroma is best explained by my original generalization about younger vintages. Using a variety of countervailing inductive generalizations, the sommelier is able to engage in a process of elimination so as to triangulate in on the correct identity of even wines which they have not themselves ever sampled before. And they can successfully identify these wines at rates which are far higher than chance, albeit only with respect to wines which fall within their domain of expertise. Indeed, if they could not do so, they would never have been certified as professional sommeliers in the first place. Or at least, so I am told. I am without hope when it comes to wine, as I have chosen to instead spend my time being wilfully bewitched by the wonderful world of whiskies.

In any case, what we learn from the Sommelier is that things, like vintages, can simultaneously fall into different classes precisely because they have more than one observable property. A (non-mutant/hybrid) wine made from Cabernet Sauvignon grapes falls into the class of red things and is therefore constrained by everything which determines membership in that class. Yet it also falls in the class of wet things, as well as the class of things made from these particular grapes, as well as the class of alcoholic

things, and the list goes on and on. In turn, since the wine sitting before us falls into multiple classes, we can use what is true about different classes to eliminate what I refer to as *possible intersections*. This red wine before me *might* be made from Cabernet Sauvignon grapes, but if that is true, then I should also expect, in addition to this wine's merely being red, that *if* it is a young vintage, it should smell of blackcurrants. If it does not smell like blackcurrants, then I can eliminate the possible intersection of this wine being both young and a Cabernet Sauvignon. It might still be a Cabernet Sauvignon, or it might still be young, but in the absence of any smell of blackcurrants, I am generally safe to eliminate the possibility that this wine belongs in both of these classes at the same time. And so it goes until at last I am left with either one possible intersection, or else just a rather narrow range of possible intersections of classes which this particular wine might be an instantiation of.

The point in creating these classes, for sommeliers, is not to infer what must be true of every member in a given class, including those which have not yet been observed. The point is to use these classes as heuristics to identify which intersection(s) of classes the unknown wine might be instantiating. These intersections are of course nothing more than just correlations between multiple properties. But it is the incompatibility between certain combinations of classes of properties which allows us to use these correlations to triangulate in on what a given thing might be, according to our inductive generalizations.

None of this is guaranteed to work. Even the best sommeliers still fail, on occasion, to successfully utilize inductive reasoning to identify a particular vintage. Yet there would

be no sommelier profession, or perfumer profession for that matter, if using induction in this way did not work *well enough*.

We have done what we were asked. We have explained how it is rational to continue to utilize inductive reasoning, even if only to test and see whether it will continue to prove useful going forward. And we have also explained *why* inductive reasoning proves useful with respect to the sommelier's task of identifying novel wines. Sure, maybe there are tasks for which the use of induction is inappropriate. We Pragmatists can happily concede that, just so long as we are shown the evidence. And sure, maybe there are tasks for which the use of induction has proven fruitful though we still do not know why. Sounds like something to look into.

Yet as far as all that nonsense about the use of *all* inductive reasoning not being rationally warranted, well, we would like to see the exhaustive body of evidence for why we should think that the use of *all* inductive reasoning is indeed categorically unwarranted. Because that sort of absolutist claim seems to us to stem from the rationalist silliness which thinks it wise to make philosophical claims *now* about that which can only be made known by way of empirical investigation in the future.

Your fellow Pragmatist,

Charles Bakker