

# David Hume, Causation, and the Problem of Induction

**Chris M. Lorkowski**

## Abstract

Scottish philosopher David Hume provided some of the most novel and important insights into the nature of causation. This article introduces his most important lines of thought regarding cause and effect, specifically, his analysis of causation culminating in his two definitions of causation and the Problem of Induction.

**Key Words:** Hume, David Hume, causation, Problem of Induction, induction, necessity, Early Modern philosophy, skepticism.

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145

## Introduction

Perhaps the largest question in philosophy is also its most basic: What makes things happen? The question is profound in both its simplicity and its scope, but it does not admit to an easy answer when we stop to ponder it. As the sciences progress, they become more adept at explaining what does happen and what will happen. They may even explain the mechanism through which something happens in terms of simpler, more basic phenomena. But this does not explain the most basic “what” of it. To take an oversimplified, abstract example, suppose I successfully reduce some event entirely into basic subatomic motions. I might even have very good, sophisticated, highly accurate theories of how those subatomic motions occur. But at some point in this reduction, we must confront the basic question of causation. Why is there subatomic motion at all and why is it efficacious? What makes it go? When we say, “the event is caused by basic subatomic motions” or more generally “A causes B,” what are we positing?

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**Corresponding author:** C.M. Lorkowski

**Address:** Kent State University at Stark, 6000 Frank Ave NW, North Canton, OH 44720

**e-mail** ✉ [clorkows@kent.edu](mailto:clorkows@kent.edu)

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Some of the most important and insightful Modern philosophical work on causation was completed by the Scottish Enlightenment philosopher David Hume (1711-1776). Calling such work “Modern” may sound strange, however, if one is not familiar with the epochs of philosophy. The Modern Period in philosophy ran from about 1600-1800.<sup>2</sup> It is distinguished by key philosophical trends that arose concurrently with the Scientific Revolution (and European theological upheavals). Though advances were made in many aspects of philosophy, the hallmarks of the Modern Period were methodological- an approach to philosophy analogous to the successful methods of the scientific revolution that include the rejection of dogma and final causes and the cultivation of free inquiry and discourse. Common trends then included a focus on epistemology and the acquisition of knowledge, a resurgence of skepticism, and an effort to understand mind, matter, and their interaction.<sup>3</sup>

In an important sense, David Hume typifies the Modern Period, arguably more so than other thinkers of the time. His philosophical writings had a wide skeptical streak, but calling him a skeptic would be an oversimplification. His skeptical reputation comes first and foremost from his sharp critiques and rejections of philosophical (and religious) tradition. A recurring pattern in many (or even most) of the philosophical topics on which Hume wrote is his exposing the failure of philosophical traditions to establish widely accepted conclusions. Put another way, he excelled at showing that we simply do not know as much as we think we do about myriad topics- from theology and philosophy of religion to ethics to philosophy of mind to causation.<sup>4</sup> The latter will be the focus of this paper. In Hume’s analysis of causation, we will see the rejection of key, pre-Humean assumptions regarding cause and effect and an empirical analysis of all we can glean from observation. Several of his central insights then contribute to possibly the most damning and difficult skeptical argument in the history of philosophy, Hume’s Problem of Induction.

### Hume’s Analysis of Causation

Hume’s analysis of causation is grounded in the empirical principles first expounded in his *A Treatise of Human Nature* and recast in *An Enquiry concerning Human Understanding*.<sup>5</sup> Both works start with

<sup>2</sup> There is some dispute here about terminology, but not as much about substance. If we say that the Modern Period ran from about 1600-1800, then afterward follows 19<sup>th</sup> Century Philosophy, 20<sup>th</sup> Century Philosophy, and Contemporary or 21<sup>st</sup> Century Philosophy. However, it is not uncommon to call these later epochs “Modern Philosophy” as well, in which case the significant period from 1600-1800 is instead designated “Early Modern Philosophy.” Lastly, there is a dispute as to whether Renaissance Philosophy should be merged with (Early) Modern Philosophy, in which case, the seminal period would begin over a century earlier.

<sup>3</sup> There are many excellent resources for understanding the nuances of the Early Modern Period, but two helpful compilations are Rutherford (2006) and Garber and Ayers (1998).

<sup>4</sup> Though his contributions in philosophy cannot be understated, so limiting his contributions would also be a disservice, as his innovations in the fields of history and economics were also significant.

<sup>5</sup> There is a scholarly debate as to how seriously to take Hume’s claims repudiating the *Treatise* and maintaining that we should hold the *Enquiries* alone as constituting his philosophy (a point Peter

Hume's central empirical axiom, the Copy Principle. Approximately stated, it requires that all constituents of our thoughts have their origins in experience. The blanket term Hume employs for the contents of the mind is *perceptions*, which are divided into *impressions* and *ideas*. Impressions are the mental contents provided immediately by the senses, whereas ideas are products of the intellect. More precisely then, Hume's Copy Principle states that all ideas are products of impressions<sup>6</sup> thereby serving as the fundamental grounding for his empiricism, whereby he seeks to understand concepts by tracing them to their constituent ideas and impressions. Hume applies his empirical method to causation in *Treatise* 1.3 and, correspondingly, the first *Enquiry*, Section VII. In both places, we find Hume's "two definitions of causation." But to fully understand why both definitions contribute to his account of causation, we will need to work up to them and bring in some additional apparatus.

First, according to Hume, there are three relations by which the mind *naturally* associates and generates ideas: resemblance, contiguity, and cause and effect (T 1.1.4.1; SBN 10-11). Of these, "causation is the most extensive" (T 1.1.4.4; SBN 12). But cause and effect is also given as one of three *philosophical* relations<sup>7</sup> that provide knowledge that falls short of certainty, the other two being identity and situation (T 1.3.1.2; SBN 70). However, causation is pivotal. Along with perception and memory, it accounts for all our knowledge of the external world but only the cause and effect relation allows us to go beyond what is immediately presented to us by the senses (T 1.3.2.2; SBN 73-74). As such, the relation of cause and effect is absolutely crucial in reasoning, which Hume defines as, "...nothing but *comparison*, and a discovery of relations...which two or more objects bear to each other" (T 1.3.2.2; SBN 73, emphasis his).<sup>8</sup> We must therefore ask what this association consists in.

For Hume, cause is not a quality of an object, as there is simply no one property common to all causes (or to all effects for that matter) (T 1.3.2.5; SBN 75). This explains why causation must be classified as a *relation* that applies between the two objects. Thus, we may arrive at a first approximation of Hume's account of causation by considering its ontological kind. Causation is a relation between the objects of our

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Millican [2002] argues we ought to take seriously and literally), or his further statement that the *Treatise* fell "dead-born from the press" a clear reference to Alexander Pope, who said in his *Epilogue to the Satires* that "All, all but the truth falls dead-born from the press" (See, for instance, E.C. Mossner [1980], page 117.) For the purposes of this work, however, I set this debate aside. Concerning his discussions regarding causation, the first *Enquiry* and the *Treatise* are sufficiently similar to think that he did not crucially alter his thinking on at least this topic.

<sup>6</sup> This is still speaking a bit loosely. The Copy Principle demands only that *simple* ideas come from simple impressions (T 1.1.1.7; SBN 4), but this implies that we can eventually trace any complex idea back to some genesis constituent impressions that have been combined via mental activity. The mind combines and relates ideas to form new ones.

<sup>7</sup> That is, relations not introduced naturally by the imagination or that do not have a "connecting principle" (T 1.1.5.1; SBN 13-14). Note that Hume therefore recognizes cause and effect as both a philosophical relation *and* a natural relation, at least in the *Treatise*, the only work where he actually draws the distinction.

<sup>8</sup> In the context of reasoning, "objects," refer to the objects of the mind, what he calls ideas and impressions.

reasoning that goes beyond our immediate impressions to obtain less than certain knowledge of the world. As it will be central to the Problem of Induction, it should be noted that, in discussing knowledge of cause and effect, Hume is using “knowledge” in what he considers the loose and popular sense. For Hume, genuine knowledge involves certainty and can only be established by the four relations that depend solely on ideas, i.e. resemblance, contrariety, quantity, and degrees of quality (T 1.3.1.2; SBN 70). Certain knowledge does not come from experience. All the other relations, including cause and effect, whose relata may be changed without a change in the ideas involved, are technically probabilities that could at best attain the level of certainty of proof but not admit of knowledge (T 1.3.1.1; SBN 69-70). With this as a starting point, let us now turn to how he works to his two definitions of cause.

In Section IV of the *Enquiry*, we find a succinct statement of “Hume’s Fork,” that “All the objects of human reason or enquiry may naturally be divided into two kinds, to wit, *Relations of Ideas* and *Matters of Fact*” (EHU 4.1; SBN 25, emphasis his). Hume presents several hallmarks for distinguishing the two, but his central distinction is that the denial of a true relation of ideas is inconceivable.<sup>9</sup> This is because relations of ideas are independent of experience and therefore can be known in an experiential vacuum. By contrast, the denial of matters of fact are conceivable, but they cannot be known independently of experience. Because a statement’s negation is either conceivable or not, Hume’s two categories must be exclusive and exhaustive.<sup>10</sup> Given this distinction, we can see that causal reasoning falls under the category of matters of fact. If a statement’s truth condition is grounded in causality, its denial is never *inconceivable*. For instance, it is obviously true that a car striking a wall at high speed will cause it damage. Yet I have no trouble forming an image in my head of it bouncing off harmlessly. The conceivability of the statement’s denial establishes that it is a matter of fact, which then entails that our knowledge of its truth depends on experience. This is an entailment of the relation of causation, but Hume further emphasizes its truth by appealing to our experience. Hume challenges us to consider any *single* event entirely independently of our previous experience. His example is of one billiard ball colliding with another. Perfect logic and even knowing the essential nature of the objects in question will not tell us anything about what happens as a result of their collision in an experiential vacuum. Experience alone lets us

<sup>9</sup> Georges Dicker (1998), page 53, seems to disagree, instead focusing on Hume’s criterion that matters of facts are all existential claims. Walter Ott (2009), page 202, instead draws attention to Hume’s claim at T 1.3.1.1; SBN 69 that relations of ideas (which he equates with the certain philosophical relations) can be known “simply by inspecting our ideas.” However, in the *Enquiry*, the existential criterion is set aside as soon as it is stated, and even assuming it is proper to equate relations of ideas and philosophical relations, Hume doesn’t even bother to carry over the scrutability criterion from the *Treatise* to the *Enquiry*. Instead, it is the denial criterion that is utilized again and again in the arguments of both works.

<sup>10</sup> Immanuel Kant later either misses, ignores, or reinterprets this point in creating a category of synthetic, *a priori* knowledge as a purported middle ground in the *Critique of Pure Reason*. This work was so influential that it caused many after to (mis)read Hume backward through Kant.

infer motion of the second from it being struck by the first<sup>11</sup> (T 1.3.6.1; SBN 86-87).

If our knowledge of cause and effect is limited to our experience, we must ask what precisely our comprehension of “causation” consists in. Strictly, what we externally *experience* of causation is merely what Hume calls constant conjunction<sup>12</sup> (T 1.3.6.2; SBN 87), that events of a certain type are always followed by events of a second type. But we usually mean something *much* stronger than this when referring to “causation.” After all, mere constant conjunction doesn’t get us the “necessary connection”<sup>13</sup> that allows us to employ causal reasoning to infer beyond what is immediately experienced (T 1.3.6.3; SBN 87-88). Given this, we are now in a position to add further content to Hume’s notion of the causation. We may say that, for Hume, the relation of causality is a constant conjunction whose relata are necessarily connected.

Hume’s true insight though is his showing just how murky this second component is. How do we make sense of the necessary connection that causation entails? As discussed above, it cannot be a logical connection, as we can imagine causal relations not obtaining. But nor can we infer that the necessity involved is a physical or metaphysical necessity which applies only to nomologically congruent worlds, that is, worlds whose laws of nature are identical to ours.<sup>14</sup> Hume considers such explanations an “absurdity to employ,” as they do not tell us anything about the original impressions involved (T 1.3.14.4; SBN 175). At best, such notions of necessity unhelpfully assert that causation is that which follows causal laws. Yet this is not an explanation but the very efficacy that Hume seeks.

We must therefore follow a different route in considering what, precisely, this necessity amounts to, these “secret connexions” that Hume’s rationalist predecessors put so much stock into. Hume again challenges us to consider what experience teaches us about such causal principles. Once more, when we consider the experience of causation in the world, all we can come up with is the experienced constant conjunction. Of the common understanding of causality, Hume states, “We never have any impression, that contains any power or efficacy. We therefore never have any idea of power” (T 1.3.14.11;

<sup>11</sup> Here it is important to remember that, besides cause and effect, the mind also naturally associates ideas via the other two natural relations, *resemblance* and *contiguity*. As such, Hume’s view should not be turned into a straw man that maintains we could only know the result if we had seen that exact type of collision before. Instead, we naturally use resemblance and contiguity to infer the result from previous experiences of transferred momentum and the like. Hume puts analogy as central to human reasoning and rightly so. Objections that maintain that, under Hume’s framework, we could not extrapolate results from a single observation miss this.

<sup>12</sup> Hume parses out this notion into four of his “rules by which to judge of causes and effects” in T 1.3.15; SBN 173-176. Constant conjunction seems to consist in: 1) contiguity in space, 2) temporal succession, 3) a constant *union*, and 4) like from like, though he does not make this reduction explicit.

<sup>13</sup> For Hume, this is to say, efficacy, power, force, etc. (T 1.3.14.4; SBN 157). He uses necessity as a blanket concept for whatever it would take to move claims about causation from probability to proof or demonstration.

<sup>14</sup> Van Inwagen (1983), page 65.

SBN 161). Therefore, "... 'tis impossible in any one instance to show the principle, in which the force and agency of a cause is plac'd," (T 1.3.14.7; SBN 158) as we don't even have an idea of that force. Because of this, our notion of a causal law seems to be a mere presentiment that the constant conjunction will continue to be constant, some certainty that such a mystery will persist. Hume argues that we *cannot* conceive of any other connection between cause and effect (T 1.3.14.13; SBN 161-162), because there simply is no other impression to which our idea may be traced. This certitude is all that remains.

It then seems that this idea of a "necessary connection" is nothing more than this certainty. But we have no impression of efficacy in the event itself. (Remember, we never experience efficacy in the relata; in the case of the billiard balls striking, all we see are the movements, the conjunction of events. We never "see" causation.) Yet as we have seen, Hume's Copy Principle requires that ideas must originate in impressions. Hume's solution is that the impression of efficacy doesn't originate in the experienced external world but is instead *produced in the mind*. Specifically, it arises as a product of the faculty of imagination, thus providing the missing impression of necessary connection. As we have seen, Hume denies we ever have such an impression in *single* instance. But as we experience enough cases of a single type of constant conjunction, say a billiard ball striking another, our minds begin to pass a natural determination from the cause to the effect. With every strike, we grow a little more certain that the next effect will follow the next cause. The impression of necessity is this feeling of certainty that the conjunction will stay constant. This is the genesis of our idea of necessity. As Hume puts it, "Necessity, then, is the effect of this observation, and is nothing but an internal impression of the mind of a determination to carry our thoughts from one object to another" (T 1.3.14.20; SBN 165). In other words, the idea of necessity that is added to the constant conjunction comes from an impression not of the world but of our feelings projected onto the world. We reach a point where we naturally must think of the effect when we think of the cause.

Having approached Hume's account of causality by this circuitous route, from association of ideas to relation to a constant conjunction with a necessity arising from our mental determination, we are now positioned to appreciate the two definitions of causation that Hume gives in the *Treatise*.<sup>15</sup> He defines "cause" in the following ways:

D1- An object precedent and contiguous to another, and where all the objects resembling the former are placed in like relations of precedency and contiguity to those objects that resemble the latter.

<sup>15</sup> He gives similar, but not identical definitions in Section VII, Part 2 of the *Enquiry*.

D2- An object precedent and contiguous to another, and so united with it, that the idea of the one determined the mind to form the idea of the other, and the impression of the one to form a more lively idea of the other (T 1.3.14.31; SBN 170).

Of course, there are reams of literature addressing the question of whether these two definitions are the same and, if not, to which of them Hume gives primacy.<sup>16</sup> Ultimately, I believe that this general line of inquiry is misguided for two reasons.

The first problem is that, based on the explication above, the definitions seem to be doing two separate things. I maintain that D1 should be seen as tracing the *external* impressions (i.e. the constant conjunction) requisite for our idea of causation and D2 is tracing the *internal* impressions, both of which are important components for Hume's complete account of causation.<sup>17</sup> As Hume himself says, they are "presenting a different view of the same object" (T 1.3.14.31; SBN 170). But if this is the case, then it is therefore inappropriate to try to reduce one to the other or assign primacy to one in defining Hume's notion of causality.

More generally, we go against Hume's intentions in forcing the two definitions together into one. Later in the *Treatise*, Hume states that constant conjunction and the feeling of certitude are two different senses of necessity, and we can define necessity either way (T 2.3.2.4; SBN 409). And we see such sentiments consistently carried out in Hume's writings, with him variously identifying both as the essence of necessity.<sup>18</sup> Hume therefore does not seem to want to consider one as superior to the other, or one as being subsumed under the other.

But we fall prone to a second error in trying to equate or subsume Hume's definitions in that such an exercise seems to conceive Hume's two definitions as the essence of Hume's account of causation. But this is wrongheaded as well. Hume goes out of his way to point out that his definitions are inadequate, that they don't really attain what one would want from a definition of causation. Hume asks,

And what stronger instance can be produced of the surprizing ignorance and weakness of the understanding than [the analysis of causation]?...so imperfect are the ideas we form concerning it, that it is impossible to give any just definition of *cause*, except what is drawn

<sup>16</sup> J.A. Robinson (1962) is perhaps the most famous proponent of the position that the two definitions are inequivalent, arguing both a logical inequivalence and that they fail to capture the same extension. For a summary of the various commentators' positions on the (in)equivalence of the two definitions and to which should be given primacy, see Garrett (1997), page 250, and for his own argument that the two are equivalent if they are both read objectively or both read subjectively, see Garrett, Chapter Five.

<sup>17</sup> With some small differences, Harold Noonan (1999), pages 150-151, and Simon Blackburn (2007), page 107, provide similar interpretations that the definitions are doing two different things, externally and internally.

<sup>18</sup> Hume refers to a reductive essence at T 1.3.14.16; SBN 163 and a mental determination essence at T 1.3.14.22; SBN 165. Robert McRae (1969) believes that this is because Hume employs two different senses of definition, the reduction serving as the mediate cause of our idea of necessity and mental determination serving as the immediate cause. Though McRae doesn't draw the conclusion, his position, if correct, would further provide a plausible explanation for Hume's dissatisfaction over the definitions (see below). If definitions in general are to explain immediate and mediate *causes* of ideas, then there is a worry of circularity over trying to define "cause."

from something extraneous and foreign to it....But though both these definitions be drawn from circumstances foreign to cause, we cannot remedy this inconvenience, or attain any more perfect definition.... (EHU 7.29; SBN 77, emphasis his).

The passage conveys Hume's dissatisfaction in the two definitions, a position difficult to square if we are giving them primacy in his account of causation. Yet such dissatisfaction is inevitable. For Hume, a *definiens* is nothing but an enumeration of the constituent simple ideas in the *definiendum*. This is a requirement of his empiricism grounded in the Copy Principle. But if Hume's account of causation is correct, then we are not in possession of any such satisfactory constituent ideas of necessity. As such, we run into the "inconvenience" of being forced to appeal to something "extraneous" in defining causation. While this is true due to the limitations of our experience, none of it implies that the definitions are faulty or incorrect- he refers to them as both "just" and "precise" at various points. The general impression then, is that they do all they can, but still fall short of accomplishing all we would like. We should then read Hume as endorsing both definitions as providing crucial insights into the notion of causation but stop short of trying to reduce his account of causation to them. Having considered the basic Humean picture of causation, let us then consider the second component, the Problem of Induction.

### The Problem of Induction

The Problem of Induction arises as a direct fallout of the less controversial aspects of Hume's account of causation- specifically that causal relations cannot be known *a priori*. Because of this, we must then ask how such inferences are *justified*. Roughly speaking, justification is having good reasons for what you believe, and a given token of knowledge can be approximated as a justified, true belief.<sup>19</sup> We can think of being justified in believing X as having a good/reasonable answer to the question, "Why do I believe X?" But before raising the Problem of Induction, it is important to acknowledge that this is an eminently reasonable question to ask. We ought to be able to defend our beliefs and defend them well if we are pushed, and acting on unjustified beliefs can be frankly dangerous to ourselves and to others. For instance, lacking a quality answer to the question, "Why do you believe vaccines cause autism?" but acting on that belief anyway puts children's lives in danger. Neither Hume nor anyone else does something unreasonable in pushing us to justify our beliefs by asking "why" questions.

<sup>19</sup> I say "approximated" due to the notorious "Gettier Problem," where Edmund Gettier famously showed that we can have justified true beliefs that are not knowledge. Here, I set aside such difficulties, as justification is still a necessary condition for knowledge even if justified true beliefs are not sufficient for it.



Having said that, Hume does seemingly restrict the asking of such “why” questions in normal discourse, and we can understand these restrictions using the terminology introduced in the previous section. In *normal* discourse, we need not answer justification questions regarding relations of ideas. Outside of a theoretical geometry course, questions like, “why do you believe a square has four sides?” are sufficiently answered with “because I cannot conceive of its being otherwise.” This leaves matters of fact, which Hume further divides into sensitive knowledge (i.e. knowledge provided by the senses), memory, and causal inference.<sup>20</sup> But Hume has no interest in a Cartesian project of radical doubt regarding the senses. If we are wearing colored glasses, “why do you believe the shirt is purple?” may be a reasonable question, but in *normal* circumstances, “because I am looking right at it” is a perfectly acceptable answer. As such, Hume need not push us on beliefs grounded in sensitive knowledge or, *mutatis mutandis*, memory. This leaves only causal inference as demanding justification and, absent any fears of stepping into a skeptical trap, is not just reasonable but necessary. But this minimal and seemingly obvious demand leads us into the Problem of Induction.

To start,<sup>21</sup> take any *particular* causal inference. For instance, suppose you plan to drop a pen right after you are finished reading this paper. What will happen? It will fall of course. Specifically, it will fall at a rate of 9.8 meters per second squared. But why do you believe this? Can you imagine (that is, literally form an image in your head) of it not doing so? Sure. You can imagine it falling a little faster, a little slower, or not at all, with no trouble. This just means its falling is a matter of fact rather than a relation of ideas. But since we are talking about a *future* instance of falling, it is neither sensed nor remembered as of now. We remember previous instances, and we infer this event will be similar. This is why our knowledge is classified as a causal inference. But this simply means we should be able to answer a “why” question, i.e. “why think that the pen will fall when you drop it at the end of this paper?”

In giving an answer to this specific question, we will answer with some employment of the Laws of Gravity, and we would do so quite reasonably. More generally, we justify *particular* causal inferences by appealing to *general* causes. As Hume tells us, human reason tries to reduce particular natural phenomena “...to a greater simplicity, and to resolve the many particular effects into a few general causes...”

<sup>20</sup> In doing so, Hume essentially collapses all inductive argument into causal inference, and there is something to this. One cannot, for example, make an argument from analogy or inference from appeal to authority without making some implicit assumptions about cause and effect, for instance, that like causes like or telling a causal story about why the authority believes what they do.

<sup>21</sup> My presentation here is intended to be both accessible and forceful. There is some dispute as to how exactly we should read Hume’s Problem of Induction. I am inclined to think Hume meant it as it is presented here, but even if a scholar thinks that the Problem *can* be raised in a much less forceful way, that does not give us license to ignore it in its most damning form. Hume gives a quick version of the Problem in the middle of his discussion of causation in the *Treatise* 1.3.6 and a more thorough version in Section IV of the *Enquiry*.

(EHU 4.12; SBN 30). As such, we will (rightly) say that the pen will fall because of gravity. But once more, we can imagine the pen not falling, but this is akin to saying we can conceive of the Laws of Gravity not applying in this case. So our belief in the relevant Law of Gravity is not a belief in it as relations of ideas. As Hume tells us, "...the knowledge of this relation is not, in any instance, attained by reasonings a priori; but arises entirely from experience..." (EHU 4.6; SBN 27). But we are still discussing a future instance, so we are discussing neither senses nor memory. As such, we are *inferring* that gravity will continue. So we must reasonably ask, "why think that the Laws of Gravity will continue to obtain at the end of this paper?"

When we ask questions about the laws of nature, we have a stock answer at the ready, and it will sound something like, "Gravity will continue because it has always obtained in the past, and the future will resemble the past." This is a specific version of something called the Principle of the Uniformity of Nature (PUN), the doctrine "*...that instances, of which we have had no experience, must resemble those, of which we have had experience, and that the course of nature continues always uniformly the same,*" (T 1.3.6.4; SBN 89, emphasis his) that is, that the unobserved will resemble the observed, that the laws of nature will not change radically and unexpectedly. This assumption is fundamental to all our endeavors- not just as a pillar of the sciences but in our everyday actions and decisions. But here we finally come to Hume's unique insight that raises the Problem of Induction. Consider PUN. Can you form an image in your head of it being false? Easily. Not only can we imagine a relatively random and chaotic universe, but our earlier imagining of the pen not falling is to conceive of the Laws of Gravity as not being uniform. But again, we are considering a future instance of uniformity, so we are inferring it rather than sensing it. As such, we owe the answer to a "why" question- "why think that nature will continue to be uniform at the end of this paper?"

Our unreflective answer at the ready will be something like, "because nature has always been uniform in the past, and it will continue to be uniform." But put this baldly, we immediately see the fallacy we employ. We have justified our belief in PUN by appealing to PUN. This is *circular* justification, which is to say no justification at all. We have given *no* reason whatsoever to think that the pen will fall when we ground its justification in a circular manner. And this will happen with *any* belief that is justified from particular to general, from general to PUN. And that is deadly serious because we quickly find that almost all of our beliefs are justified in this way. Without exaggeration, it seems to undermine 99.999% of all our beliefs- that the pen will fall, that your arm will not fall off and turn into a flying chinchilla, that the sun will rise tomorrow, that your parents are who you think they are, that there was such a person as Julius Caesar; *anything* that you can conceive as false and is based on causal inference.

This is Hume's Problem of Induction, and there is not an easy solution. While Hume himself provided a solution, suffice to say, it is nowhere near as well-received or well-understood as the Problem.<sup>22</sup> It is even a matter of scholarly debate as to just how seriously we should take Hume's solution, though such disputes are merely a matter of historical interpretation. The fact is that the Problem has been raised, and whether he thought his own solution was adequate or not is of less importance as to whether we think it is.

We quickly find, however, that any solution to the Problem of Induction leaves us uncomfortable. For instance, a quick solution would be to deny that conceivability is a guide to possibility, that even if we can imagine the pen not falling, it does not follow that such an event is logically possible. But to do the work we need it to, we would not just need to deny that conceivability is a guide to possibility but say that the pen falling is a matter of logical necessity, a road that quickly leads to logical fatalism. A more common approach is to employ something like the G.E. Moore shift and say that, because we do have knowledge, the Problem of Induction must not be correct. But without compelling reasons to think that it is incorrect, such maneuvers can be the intellectual equivalent of whistling past the graveyard. The most promising approach would then be to argue an error in Hume's reasoning, (for instance, Kant's attempt to find a middle ground between relations of ideas and matters of fact) or more generally, go at the lynchpin of the argument- to give non-circular reasons for thinking that PUN is true. And attempts have been made. However, suffice to say that, as the Problem itself is both forceful and nuanced, any solution must be as well. As such, purported solutions are a topic for another paper.<sup>23</sup>

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<sup>22</sup> For a brief introduction to the three major interpretations of Hume's account of causation that arise from it, see Lorkowski (2011).

<sup>23</sup> For an introduction to approaches toward a solution, see Henderson (2022). For what it is worth, I find no solution to be so persuasive as to consider the problem solved, but there are reasonable approaches that at least somewhat assuage the worry.

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