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Hume's "Of scepticism with regard to reason"

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Abstract: The arguments in "Of scepticism with regard to reason" get their start from Hume's claim that, thanks to our "fallible and uncertain faculties," we must "check" any present judgment from reason in a step of corrective reasoning (T 1.4.1.1; SBN 180). A corrective step is meant to "correct and regulate" present judgments from reason through reflection on past judgments from reason (T 1.4.1.5; SBN 181-82). Hume argues that this ushers in the extinction of knowledge and belief because reflection on past judgments will inevitably diminish our assurance for any present judgment. Why Hume thinks diminishment is inevitable has remained elusive. The key, I contend, is that our assurance for judgments diminishes because of what must be *presupposed* in order to make and accept them. Explicit consideration of the possibility that our present reasoning is mistaken would keep us from making or accepting any present judgment from reason. So to reach any judgment by reasoning, we must presuppose that we are reasoning *legitimately*, that is, from the right evidence and in the right way. Past judgments from legitimate reasoning are evidence that this presupposition is true while past judgments from erroneous reasoning are evidence that it's false. Because legitimacy must be presupposed, the former evidence is *accounted* for in any present reasoning while the latter evidence is not. Accordingly, past errors afford *unaccounted-for* evidence that, when explicitly considered in a corrective step, can only diminish our present assurance. However, to stand pat with respect to a corrected judgment is to presuppose that it has been reached by legitimate reasoning. Past errors are evidence that this presupposition is false and that we've made the wrong *corrected* judgment. This prompts further reflection, which leads to further diminishment, which prompts further reflection, and so on until our first assurance is diminished to nothing—hence the extinction of knowledge and belief. Thus, Hume's skeptical conclusions follow from reflecting on past judgments in successive corrective steps because the legitimacy of our present reasoning must be presupposed in order to make and accept any present judgment from reason.

Hume's "Of scepticism with regard to reason"

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Contents

Introduction

Hume's "Of scepticism with regard to reason" is just over four pages long. This dissertation, which runs well over two-hundred pages, focuses on just the first two. Obviously, more needs to be said. But for now, I have to rest content with addressing Hume's central arguments in this difficult section of the *Treatise*.

I mention its shortness because it makes Hume's conclusions there all the more striking. In just two pages, Hume takes himself to have shown how reasoning as we should entails the extinction of knowledge and belief. More carefully, he argues that when we reason responsibly, the assurance of knowledge must degenerate to the assurance of probability, and the assurance of probability must diminish to nothing. Hume famously describes this as "a total extinction of belief and evidence" (T 1.4.1.6; SBN 183).[1]

The arguments are puzzling. But from an initial reading, you feel like you've nearly understood how they're supposed to work. The broad outlines are clear enough in that the arguments have something to do with our fallibility. We sometimes make mistakes when reasoning. That's a relevant piece of data for anyone who cares about the trustworthiness of their judgments. So if we're being responsible, we ought to take this fact into consideration when making judgments on the basis of reasoning.

But admitting that we sometimes make mistakes forces us to admit that any instance of reasoning might be mistaken. And from this admission, we're bound to lose confidence in any judgment reached by reasoning. As a result, we can't be fully certain about any conclusion from

[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number.

demonstrative reasoning, which means "all knowledge degenerates into probability" (T 1.4.1.1; SBN 180). Likewise, our assurance for any judgment reached by probable reasoning must somewhat diminish when we consider that it may have been reached in error.

But we're not done yet. It's possible that we've made some mistake in accounting for the possibility of a present error. From this admission, our assurance for a present judgment is bound to diminish even further. But again, we may have made some mistake in reaching this twice diminished judgment. Reflecting on this fact leads to further diminishment, which prompts further reflection, which leads to further diminishment, and so on until we reach a stage where we're left with no assurance at all, that is, we reach a total extinction of belief.

On a first read that is sufficiently brisk, the arguments look like they basically work. Hume encourages our optimism when he sums up the thrust of the arguments by reporting that "when I reflect on the natural fallibility of my judgment, I have less confidence in my opinions" (T 1.4.1.6; SBN 182-83). Surely that's right. When I remember that I'm terrible at math, I double check even the simplest additions. When I recall that I make mistakes about mundane things like restaurant-hours, I'm forced to google before going to dinner. What's more, Hume suggests that time devoted to fully understanding the arguments will not be wasted since he assures us that we will "find no error in the foregoing arguments" (T 1.4.1.8; SBN 183-84).

While the conclusions are surprising, the claim that we will find no error is especially striking given the way the arguments have been received. Contrary to what Hume supposes, much of the debate about this section has not been over whether there is some error, but rather, how many errors there are, which ones are the most egregious, and whether any of them might be overcome. William Morris (1989) helpfully recounts a bit of this infamous history:

> The argument is generally regarded as enigmatic if not downright embarrassing. Most of his recent interpreters, especially those who stress 'Hume's naturalism', avoid this section altogether. Those who do mention the argument describe it as "unsuccessful," "notoriously unclear," and "unpleasant ." Even a sympathetic recent expositor calls it a "morass," while another commentator, obviously less sympathetic, regards the argument as "not merely defective, but one of the worst arguments ever to impose itself on a man of genius." (39)

These reactions (especially that last one) encourage us to ask how "a man of genius" like Hume could have been so blind to what is so obvious to everyone else, namely, that his arguments are hopelessly flawed.

Two long-standing objections spotlight what are taken to be two of the most serious flaws. First, Hume claims the arguments work, not simply by reflecting on our fallibility, as his summary suggests, but by forming a second judgment "as a check or controul on the first judgment" (T 1.4.1.1; SBN 180). But it's unclear how a second, independent judgment has any bearing on a first so as to "check or controul" it in any way. Second, Hume supposes that the formation of this second judgment must diminish our assurance for some first judgment. But we're told that this second judgment is formed, again, not merely by reflecting on our fallibility, but by weighing our past failures in reasoning *together* with our past successes. In that case, it's unclear why our assurance for a first judgment can only go down—if we conclude that our first judgment is probably correct, why would our assurance for it diminish?

Recently, interpreters like William Morris, Don Garrett, Michael Lynch, and David Owen, to name only a few, have tried to show that these obstacles can be overcome. In general, recent commentators have been kinder to this section of the *Treatise*. Still, whether philosophers are criticizing or defending them, there's little agreement as to how the arguments unfold. In

other words, apart from *whether* the arguments might be made to work, there's no agreement about how the arguments are *supposed* to work.

For instance, Morris (1989) explains extinction by saying that as our assurance for a first judgment diminishes, our assurance for its negation increases until we eventually suspend judgment (50). Garrett (2006) argues that from the formation of successive judgments, where a later one expresses a doubt about the previous one, doubts are transmitted down a chain of judgments to diminish assurance for some first judgment (161-63). Lynch (1996) suggests that mounting uncertainty from reflection on past errors forces us to successively "widen" the range of the probability for a first judgment until it falls somewhere between 0 and 1, i.e., until we no longer know what to believe (93-94). Regarding the degeneration of knowledge in particular, Owen (1989) tell us that from reflection on our fallibility, a first knowledge claim becomes "embedded" in a probable belief (181-83).

That these widely differing approaches are not only available but *viable* suggests we haven't yet understood how Hume thought the arguments should go. One reason for this is that interpreters tend to employ an account of probable reasoning that is not Hume's own. Probable reasoning tends to be characterized as a mechanism for assigning probabilities to judgments or propositions. But for Hume, probable reasoning is a mechanism for determining what, if anything, we should presently believe in the face of contrary evidence. In particular, Hume casts probable reasoning as a procedure for making a judgment about a "single event" where past experience supplies conflicting evidence about whether such an event will presently occur (T 1.3.12.11; SBN 134-35). My aim in this dissertation is to provide a thoroughly Humean interpretation of this section. When we rely on the framework Hume develops in earlier sections

of the *Treatise*, we can see how the arguments are supposed to work and why Hume believes they contain no errors.

We've taken a first step by noting that the arguments are not driven by an abstract worry about our fallibility. Instead, Hume argues that degeneration and diminishment are the consequences of weighing the evidence afforded by recollected judgments from reason:

> We must, therefore, in every reasoning form a new judgment, as a check or controul on our first judgment or belief; and must enlarge our view to comprehend a kind of history of all the instances, wherein our understanding has deceiv'd us, compar'd with those, wherein its testimony was just and true. (T 1.4.1.1; SBN 180)

We can understand this as the claim that fully proportioning our judgments to all relevant evidence requires at least two steps of reasoning to account for two bodies of relevant evidence.

This second step of reasoning is what I call *corrective reasoning*, since Hume also says it works to "correct and regulate" a first judgment (T 1.4.1.5; SBN 181-82). Corrective reasoning is a special case of probable reasoning. As I said, in probable reasoning we weigh contrary evidence from past experience. Corrective reasoning is a special case in that the relevant evidence is given by our recollected judgments from reason. Many of these will be judgments reached by what I call "legitimate reasoning," i.e., cases where we reach the right judgment by legitimately reasoning from the right evidence and in the right way. But at least some of our recollected judgments will be recollected errors. These are judgments reached by what I call "illegitimate reasoning," i.e., cases where we reach the wrong judgment by illegitimately reasoning either from the wrong evidence or in the wrong way.

I use "right" and "wrong" rather than "true" and "false" because we sometimes make false judgments without making an error in reasoning. To use an example from Hume, if we

expect better weather in June than in December, Hume says we've reasoned "justly" and in accordance with past experience (E 10.3; SBN 110).[2] That is, we've legitimately reasoned from the right evidence and in the right way, in which case, we've made the right judgment. But it sometimes happens (especially with the weather) that by reasoning justly and in accordance with past experience, we reach a judgment that turns out to be false. In other words, we may have judged falsely in spite of reasoning legitimately. Even so, if we couldn't have reasoned better, then we shouldn't have reasoned differently. And if we shouldn't have reasoned differently, then we've made no error in reasoning. This is why I say that, independently of their truth or falsity, we reach the right judgment from legitimate reasoning and the wrong judgment from illegitimate reasoning.

In light of our past successes and failures in reasoning, our recollected judgments yield a set of contrary evidence. According to Hume, when we weigh this contrary evidence in a corrective step, assurance for a first judgment inevitably diminishes. To make sense of this, we need to explain why a corrective step impacts our first assurance at all and why that impact must be one of diminishment. The key, I contend, turns on two points: (1) the identification of a presupposition required for making and accepting any judgment on the basis of reasoning and, (2) the recognition that our recollected errors in reasoning are evidence that this presupposition is false.

First, a corrective step has some bearing on a first judgment because of what is presupposed in any step of reasoning. The explicit consideration of the possibility that,

[2] References to the first *Enquiry* are to David Hume, *An Enquiry concerning Human Understanding: A Critical Edition*, ed. Tom L. Beauchamp (Oxford: Clarendon Press, 2000), cited as "EHU" followed by section and paragraph number, and to *Enquiries Concerning Human Understanding and Concerning the Principles of Morals*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 3rd ed. (Oxford: Clarendon Press, 1975), hereafter cited as "SBN" followed by page number.

presently, we're illegitimately reasoning from the wrong evidence or in the wrong way, would undermine our present reasoning. Further, it would also keep us from simply accepting any judgment we might presently reach. So to make or accept any judgment on the basis of our present reasoning we must presuppose the legitimacy of our reasoning, viz., that we're presently reasoning from the right evidence and in the right way. To presuppose this is to take it for granted as if we have full evidence in support. Thus, to presuppose the legitimacy of our reasoning is to take it for granted such that any possibility or evidence to the contrary is ignored.

If we're to make and accept a first judgment on the basis of our reasoning, we must presuppose that our reasoning in that step is legitimate. But because all reasoned judgments are produced by the same cause, i.e., *reason*, our recollected judgments afford relevant evidence for judging the likely effect of any present instance of reasoning. In particular, recollected judgments afford relevant evidence about the (likely) truth or falsity of a first presupposition of legitimacy.

Recollected judgments reached by legitimate reasoning are evidence that a first presupposition of legitimacy is true. As such, they are evidence that we've presently reached the right judgment. On the other hand, recollected judgments reached by illegitimate reasoning are evidence that a first presupposition of legitimacy is false. Accordingly, our recollected errors are evidence that we've presently reached the wrong judgment. Here we find a solution to the first puzzle. A corrective step impacts our assurance for a first judgment because the evidence weighed in that step has some bearing on whether that judgment is right or wrong.

Given the availability of this evidence, to accept or stand pat with respect to a first judgment would be to ignore relevant evidence. More precisely, accepting a first judgment solely on the basis of our initial reasoning would be to persist in the presupposition that our

reasoning in that step is legitimate in spite of evidence to the contrary. Instead, to account for *all* relevant evidence, a first step of reasoning must be continued with a second, corrective step. So properly understood, a step of corrective reasoning is the *continuation* of our initial reasoning where additional relevant evidence is taken into account.

Taking this second step takes us to our second puzzle. Hume contends that when we continue our reasoning with a corrective step, our assurance for a first judgment inevitably diminishes. The answer to why assurance can only go down turns on the nature of the evidence supplied by recollected judgments. Because the legitimacy of our reasoning is something we've taken for granted in a first step, any evidence that this presupposition is true is *accounted* for in our first step of reasoning. So any evidence in support of a present presupposition of legitimacy must be neutral with respect to any judgment reached by that reasoning.

On the other hand, in taking the legitimacy of our present reasoning for granted, we ignore the evidence from recollected errors. As a result, the evidence from recollected errors is unaccounted for in any step of reasoning. Accordingly, a corrective step introduces unaccounted-for evidence that a first presupposition of legitimacy is false and that a first judgment is wrong. Taking this evidence onboard establishes a degree of less than full assurance for the presupposition that our reasoning in a previous step is legitimate, thereby diminishing assurance for any judgment reached in that step. So only evidence against a present presupposition of legitimacy makes a difference to our judgments, and that difference must be one of diminishing our assurance for them. Here we get a solution to the second puzzle: a corrective step inevitably diminishes our assurance for a first judgment by fixing a degree of less than full assurance for the presupposition that it has been reached by legitimate reasoning. Put

differently, because legitimacy is presupposed as if we have full evidence in support, our first assurance can only go down in a corrective step.

From here we can briefly sketch how the skeptical arguments are supposed to work. Suppose we reach a first judgment by engaging in demonstrative reasoning. We secure the assurance of demonstrative certainty only if we presuppose the legitimacy of our reasoning in a first step. Given our past errors in demonstrative reasoning, our assurance for this presupposition can never be full. In a corrective step, weighing the contrary evidence from recollected judgments fixes a degree of less than full assurance for a first presupposition of legitimacy. As a result, assurance for any judgment reached in a first step of reasoning diminishes. Consequently, our first assurance of demonstrative certainty degenerates to the less than full assurance of a probable judgment.

A similar result follows for any probable judgment. Suppose we reach a first judgment by engaging in probable reasoning. We retain our original assurance for this judgment only if we presuppose the legitimacy of our reasoning in a first step. Given our past errors in probable reasoning, our assurance for this presupposition can never be full. With a corrective step we establish a degree of less than full assurance for a first presupposition of legitimacy, thereby diminishing assurance for our first judgment. In this way, our first assurance for any probable judgment must diminish somewhat in a corrective step.

But we're not done yet. A first step of corrective reasoning delivers corrected demonstrative and probable judgments made with something less than their original assurance. But corrective reasoning is a type of probable reasoning. We retain a degree of corrected assurance for our corrected judgments only if we presuppose the legitimacy of our corrective reasoning. Given our past errors in probable reasoning, our assurance for this presupposition can

never be full. So to account for the evidence afforded by our recollected errors, any step of corrective reasoning must be followed by a further corrective step.

Each step of corrective reasoning yields less than full assurance for the presupposition that our reasoning in a previous step is legitimate. As a result, each corrective step further diminishes our first assurance, while prompting an additional step of corrective reasoning. In this way, we're forced to successive steps of correction and diminishment "till at last there remain nothing of the original probability, however great we may suppose it to have been, and however small the diminution by every new uncertainty" (T 1.4.1.6; SBN 182). This total diminution of our original assurance is the "total extinction of belief and evidence" threatened by Hume's skeptical arguments against reason. If I've got things right, we're threatened with this skeptical conclusion because of what must be presupposed if we're to make and accept any judgment whatsoever on the basis of our present reasoning.

Chapter 1

Hume's Three Senses of "Probability" and Two Types of Probable Reasoning

I. Introduction

Hume's "Of scepticism with regard to reason" contains two infamous arguments that are supposed to deliver their conclusions through a process of probable reasoning. Accordingly, a prerequisite for getting those arguments right is getting Hume's account of probable reasoning right. Satisfying this requirement is complicated by the fact that Hume distinguishes between two types of probable reasoning. Identifying these two types of probable reasoning is complicated by the fact that Hume employs three different senses of "probability" in distinguishing them. Making matters worse, none of these three senses track our most common use of the term, where "probability" refers to a number that serves as a measure of likelihood or degree of confidence. Together, these complications help to explain why we haven't yet fully understood how Hume thinks about probable reasoning. The aim of this chapter is take the first step toward a new interpretation of the skeptical arguments against reason by drawing out Hume's three senses of "probability" and distinguishing his two types of probable reasoning.

In what follows, we'll see that Hume acknowledges a fairly straightforward procedure of probable reasoning suited for securing long-run estimates of likelihood and relational judgments about which types of possible outcomes are more or less likely than others. But we'll also see that Hume believes this relatively familiar procedure is inadequate for explaining how we "form a judgment concerning one single event, which appears uncertain" (T 1.3.11.8, 1.3.12.11; SBN

127, 134-35).[1] What Hume takes to be his unique contribution to our thinking about probable reasoning, and what forms his central concern with it, is the articulation of a procedure whereby single-event judgments are made on the basis of non-uniform, contrary evidence.[2]

In developing this account, Hume appeals to three senses of "probability." In Hume's first sense, "probability" refers to a source of uncertainty, specifically, the contrary evidence that informs single-event probable reasoning (T 1.3.11.2; SBN 124). Hume's second sense of "probability" refers to a superiority of evidence where, with respect to a set of contrary evidence, one type of event is favored by a majority of the evidence (T 1.3.11.8, 1.3.12.17; SBN 127, 136-37). Finally, "probability" in Hume's third sense refers to "reasoning from conjecture," which is a procedure for resolving the contrariety in a set of contrary evidence (T 1.3.11.3; SBN 124-25). Putting it all together, where a set of contrary evidence includes a superiority of evidence, resolving the contrariety delivers a probable judgment about a single event.

Unpacking Hume's three senses of "probability" is the key to clarifying his approach to probable reasoning generally. It allows us to distinguish between the two types of probable reasoning Hume acknowledges, which means we can take seriously his account of single-event judgments without thereby giving up on a more familiar approach to probable reasoning. At the same time, it shows how we misunderstand Hume when we suppose this more familiar approach to probable reasoning is what he's trying to capture.

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[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number.

[2] "The celebrated *Monsieur Leibnitz* has observed it to be a defect in the common systems of logic, that they are very copious when they explain the operations of the understanding in the forming of demonstrations, but are too concise when they treat of probabilities, and those other measures of evidence on which life and action entirely depend…The author of the *Treatise of human nature* seems to have been sensible of this defect…and has endeavoured, as much as he can, to supply it. As his book contains a great number of speculations very new and remarkable, it will be impossible to give the reader a just notion of the whole" (A 4: SBN 646-647).

This new interpretation of Humean probable reasoning unfolds over ten sections. As a point of contrast for our discussion of matter of fact reasoning, Section II. opens with a brief look at Hume's account of demonstrative reasoning. Section III. sketches a general picture of matter of fact reasoning that highlights past experience as the only source of matter of fact evidence. In Section IV. we see how Hume's first sense of "probability" is used to distinguish causal judgments grounded on uniform evidence from probable judgments grounded on non-uniform evidence. With the help of some influential interpretations, Section V. takes a first pass at explaining how we should handle the evidence for probable reasoning. Ultimately, from running together two procedures that Hume is careful to keep separate, these interpretations are shown to be, at best, incomplete.

From there, Section VI. addresses a further obstacle to interpretation by highlighting two ways single-event judgments might be produced, viz., either *directly* as a result of custom and habit or *indirectly* as a result of weighing the evidence from past experience. After showing that Hume has this latter, indirect procedure in mind, Section VII. examines his second sense of "probability," viz., *probability as a superiority of evidence*. Section VIII. takes up Hume's third sense of "probability" and develops his procedure for resolving the contrariety in a set of contrary evidence.

To explain how we make a single-event judgment on the basis of contrary evidence, Hume invokes what I'll call a "balancing" procedure whereby contrary or conflicting pieces of evidence cancel. Any evidence that survives balancing is all of the same type and, thus, grounds a judgment about "one single event" (T 1.3.12.11; SBN 135). In Section IX. we take a closer look at alternative interpretations of Hume's approach to probable reasoning, showing how they either run together Hume's two types of probable reasoning or privilege one at the expense of the

other. Finally, Section X. reflects on some general conclusions about Hume's approach to probable reasoning while anticipating the next step toward a new interpretation of Hume's "Of scepticism with regard to reason," viz., an investigation of errors in reasoning.

II. Demonstrative Reasoning and the Certainty of Knowledge

"ALL kinds of reasoning," Hume tells us, "consist in nothing but a *comparison*, and a discovery of those relations, either constant or inconstant, which two or more objects bear to each other" (T 1.3.2.2; SBN 73-74). On a broad view, Hume distinguishes between two types of reasoning, viz., demonstrative reasoning, which targets constant relations, and matter of fact reasoning, which targets inconstant relations. Before we get to matter of fact reasoning and Hume's three senses of "probability," we'll briefly look at demonstrative reasoning as a point of contrast.

Demonstrative reasoning affords the only possible route for securing knowledge from reason. For Hume, knowledge is certainty that "arises from the comparison of ideas, and from the discovery of such relations as are unalterable, so long as the ideas continue the same" (T 1.3.3.2; SBN 79). Certainty is possible because the objects of knowledge are ideas that stand in one of four constant relations, viz., resemblance, contrariety, degrees in quality, and proportions in quantity or number (T 1.3.1.2; SBN 70).[3] Constant relations are those relations that "depend entirely upon the ideas, which we compare together" (T 1.3.1.1; SBN 69). So when ideas stand in a constant relation, they do so *invariably* just in case the ideas being compared remain the same.

[3] Constant relations are those relations that remain unchanged just in case the ideas compared remain the same. (T 1.3.1.2; SBN 70).

For instance, when I call to mind and compare two ideas of red fire engines, I notice that these ideas stand in particular constant relations, e.g., the ideas resemble with respect to their color, and the number of tires on the one fire engine is equal to the number of tires on the other. Because relations of resemblance and proportion in quantity or number are constant, my fire-engine-ideas invariably stand in the foregoing relations so long as the ideas remain unchanged. Further, because constant relations depend only on the ideas compared, when ideas stand in such a relation their *failure* to do so is *inconceivable*. Thus, certainty is the mark of knowledge insofar as the falsity of what is *known* is inconceivable.[4]

At least in the simplest of cases, all four constant relations can be judged intuitively or "at first sight, without any enquiry or reasoning" (T 1.3.1.2, 1.3.1.3; SBN 70).[5] The fire-engine-ideas illustrate this point in that judgments about their color resemblance and tire-equality are made immediately and without any reasoning. Accordingly, demonstration is restricted to just those proportions in quantity or number that can't be "comprehended in an instant" (T 1.3.1.3, 1.3.1.5; SBN 70, 71). In particular, Hume confines the demonstrative sciences to algebra and arithmetic so that, strictly speaking, all demonstrative judgments are mathematical judgments (T 1.3.1.5; SBN 71).

While intuitive judgments follow directly and "immediately" from a comparison of ideas, demonstrative judgments are reached in an indirect manner "by the interposition of other ideas" (T 1.3.7.3; SBN 95). Our employment of intermediary ideas is guided by demonstrative rules

[4] "Whatever is absurd is unintelligible; nor is it possible for the imagination to conceive any thing contrary to a demonstration" (T 1.3.7.3; SBN 95).

[5] Hume is especially clear on this for the first three relations, saying that they "are discoverable at first sight, and fall more properly under the province of intuition than demonstration" (T 1.3.1.2; SBN 70). But he adds that, at least for the simplest of cases, we might determine "the *proportions* of *quantity* or *number*" intuitively and "at one view observe a superiority or inferiority betwixt any numbers, or figures; especially where the difference is very great and remarkable" (T 1.3.1.2; SBN 70, Hume's emphasis).

that Hume describes as "certain and infallible" (T 1.4.1.1; SBN 180). While Hume says little about these rules, his examples concerning mathematicians and accountants imply they are the familiar rules we're taught in arithmetic and algebra courses. So long as these demonstrative rules are properly applied, we secure knowledge from demonstrative reasoning.

We can make this more precise by saying that demonstrative knowledge is secured through the proper application of infallible rules such that our demonstrative judgments conform to a "precise standard":

> [A]lgebra and arithmetic [are] the only sciences, in which we can carry on a chain of reasoning to any degree of intricacy, and yet preserve a perfect exactness and certainty. We are possest of a *precise standard*, by which we can judge of the equality and proportion of numbers; *and according as they correspond or not to that standard, we determine their relations, without any possibility of error*. When two numbers are so combin'd, as that the one has always an unite answering to every unite of the other, we pronounce them equal. (T 1.3.1.5; SBN 71, my emphasis)

Where our demonstrations "preserve a perfect exactness and certainty," our demonstrative judgments conform to a precise standard. Where our demonstrative judgments conform to a precise standard, they are demonstratively certain and their falsity is inconceivable. Thus, we secure demonstrative certainty from demonstrative reasoning through the proper application of demonstrative rules.

III. Matter of Fact Reasoning and the Evidence of Past Experience

Shifting our attention to matter of fact reasoning, which includes causal and probable reasoning, Hume tells us that "all reasonings concerning *matter of fact* are founded on the

relation of cause and effect" (A 8; SBN 649, Hume's emphasis). The relation of cause and effect is *inconstant* insofar as it "may be chang'd without any change in the ideas" (T 1.3.1.1; SBN 69-70).[6] Saying the relation can be "changed" is to say that we're able to imagine, without contradiction, anything causing, or failing to cause, any other thing. For instance, we can imagine two billiard balls colliding and exploding, or merging, or stopping, or ricocheting, or, well, anything. So with respect to the relation of cause and effect we can conceive of a change in the relation without any change in the ideas compared.[7]

By classing cause and effect as an inconstant relation, Hume is pointing out that we cannot identify causal relations simply by comparing ideas. Instead, causal relations must be taught by experience:

> 'Tis therefore by EXPERIENCE only, that we can infer the existence of one object from that of another…In all those instances, from which we learn the conjunction of particular causes and effects, both the causes and effects have been perceiv'd by the senses, and are remember'd. (T 1.3.6.2; SBN 87)

Whereas demonstrations target relations of ideas, because they are only discovered through experience, "all reasonings from causes or effects terminate in conclusions…concerning the existence of objects or of their qualities" (T 1.3.7.2; SBN 94-5). So by Hume's lights, any judgment reached by matter of fact reasoning must be grounded on the evidence afforded by past experience.

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[6] In total, Hume identifies three inconstant relations, "which depend not upon the idea, and may be absent or present even while *that* remains the same…These three relations are *identity, the situations in time and place, and causation*" (T 1.3.2.1; SBN 73, Hume's emphasis).

[7] "[T]here are no objects, which by the mere survey, without consulting experience, we can determine to be the causes of any other; and no objects, which we can certainly determine in the same manner not to be the causes. Any thing may produce any thing. Creation, annihilation, motion, reason, volition; all these may arise from one another, or from any other object we can imagine" (T 1.3.15.1; SBN 171).

In relying on past experience as a source of evidence for matter of fact reasoning, we're assuming that the future will resemble the past (T 1.3.6.4-7; SBN 88-90). That is, we're taking for granted what I'll call the "uniformity principle," viz., that in the future, the world and its objects will behave as they have in the past. Readers of the *Treatise* will recognize the uniformity principle as the starting point for Hume's infamous criticism of induction. There Hume argues that the uniformity principle cannot be established by reason but that we take it for granted merely as a result of custom and habit (T 1.3.6.11; SBN 91-92). Unfortunately, an examination of this argument is beyond the scope of our present concerns. For our purposes, what matters is that engaging in any sort of matter of fact reasoning requires assuming that the future will resemble the past.

The assumption of uniformity functions to restrict the set of evidence that one must consider in matter of fact reasoning. To see what I mean here, recall that any object is conceivably causally related to any other object. Absent an appeal to the uniformity principle, reasoning about a particular causal relation would require considering all conceivable possibilities. To borrow an example from Hume concerning the tossing of a die, where the evidence isn't restricted by relevant past experience, "nothing limits the chances, [and] every notion, that the most extravagant fancy can form, is upon a footing of equality" (T 1.3.11.6; SBN 126). Under those circumstances, matter of fact reasoning would be impossible in practice.

But when we introduce the assumption of uniformity, we restrict matter of fact evidence to just those possibilities that are confirmed by past experience: "as past experience regulates our judgment concerning the possibility of these effects, so it does that concerning their probability" (T 1.3.12.8; SBN 133). Then for matter of fact reasoning in general, the *relevant* possibilities are what I'll call *confirmed possibilities*:

> Witnessed events that are confirmed by, and accessible in, past experience such that, given the uniformity principle, they afford positive evidence in support of the present or future occurrence of those event-types

More simply, a confirmed possibility is an experienced event that, in virtue of its past occurrence, gives us at least some reason to expect an event of that type in the future. For instance, in light of recent events, past experience affords positive evidence of the future possibility of the Cubs winning the World Series, a musician winning the Nobel Prize for Literature, and a reality television star winning the presidency. These *confirmed possibilities* are positive evidence that these event-types may happen again in the future.

Restricting matter of fact evidence to confirmed possibilities excludes from consideration what I'll call *mere possibilities*:

> Consistently conceivable but unwitnessed, unexperienced event-types such that past experience supplies no positive evidence in support of their present or future occurrence

More simply, a mere possibility is an event-type that we can imagine but have never experienced. For instance, it's consistently conceivable that the sun will fail to rise, and that a tossed-die will fail to fall, and that an evil demon is presently deceiving me. As such, each of these event-types are possibilities. However, because past experience supplies no positive evidence in support of them, these unexperienced event-types are *mere* possibilities. Consequently, they fail to supply relevant evidence for reasoning about matters of fact.

Broadly speaking then, the set of relevant evidence for matter of fact reasoning is the body of past experience. With respect to a particular matter of fact about which we might reason, a particular subset of this evidence will be relevant. A relevant subset of evidence is determined by the present aims and circumstances of our reasoning. For instance, if we're reasoning about whether the sun will rise tomorrow or whether a tossed-die will fall, different subsets of evidence from past experience will be relevant given the different aims and

circumstances of our reasoning. In this way, the relevant evidence for a particular occasion of matter of fact reasoning is restricted to a subset of confirmed possibilities that I'll call *live possibilities*:

> Confirmed possibilities that carry evidential weight in one's present reasoning in light of one's present aims and circumstances

More plainly, when we find ourselves in relevantly similar circumstances or with relevantly similar aims, a confirmed possibility is a live possibility insofar as past experience gives us reason to take an event of that type into consideration.

For example, past experience includes confirmed possibilities of tossed-dice falling and turning up one side to the exclusion of the others. When we're reasoning about a die-toss, we identify these confirmed possibilities as live possibilities. Likewise, when we're reasoning about whether the sun will rise, we recognize confirmed possibilities of the sun's rising as live possibilities. In each case, each live possibility (i.e., each recollected event) is a piece of positive evidence in support of the occurrence of an event of that type. Taking all relevant live possibilities together gives us a set of relevant evidence for reasoning about a particular matter of fact. Thus, the evidence for matter of fact reasoning is restricted by the uniformity principle while our selection of a subset of evidence for a particular occasion of reasoning is informed by our present aims and circumstances.

IV. Hume's First Sense of "Probability": A Source of Uncertainty

From here we can distinguish causal reasoning from probable reasoning by marking a difference in the nature of the evidence that informs each type of reasoning. Hume tells us that "arguments from causation exceed probability, and may be receiv'd as a superior kind of evidence" (T 1.3.11.2; SBN 124). This is because the relevant evidence for an instance of causal

reasoning is a set of *uniform* evidence where all of the live possibilities are of the same type. In taking the past as the standard for the future, Hume says we would appear "ridiculous" if we described conclusions grounded on uniform evidence as *merely* probable:

> One wou'd appear ridiculous, who wou'd say, that 'tis only probable the sun will rise to-morrow, or that all men must dye; tho' 'tis plain we have no further assurance of these facts, than what experience affords us. (T 1.3.11.2; SBN 124)

More generally, it would be "ridiculous" to say of particular types of uniform experience that, under relevantly similar conditions, their occurrence is *only* probable. After all, past experience supplies no positive evidence against the occurrence of such events. Consequently, judgments grounded on uniform evidence from past experience are what Hume calls "proofs," viz., "those arguments, which are deriv'd from the relation of cause and effect, and which are entirely free from doubt and uncertainty" (T 1.3.11.2; SBN 124).

Proofs are free from doubt insofar as past experience affords no evidence against them. This is another way of making the point that mere possibilities fail to supply relevant evidence for matter of fact reasoning in general and causal reasoning in particular. Restricted by the uniformity principle, mere possibilities carry no evidential weight in our causal reasoning. Because the sun has always risen and unsupported objects have always fallen, the evidence for reasoning about the sun's rising and a die's falling is uniform. Thus, we secure proofs regarding these matters of fact in spite of the conceivability of the sun failing to rise and the conceivability of an unsupported die failing to fall.

Though mere possibilities carry no evidential weight in matter of fact reasoning, they serve to mark a boundary between the certainty of demonstrative knowledge and the full assurance of causal proofs. We can put this by saying there is a difference between

demonstrative certainty and we might call "causal certainty." Demonstrations target constant relations. Where demonstrative rules are properly applied, demonstrations "preserve a perfect exactness and certainty" such that the falsity of a genuine demonstration is inconceivable (T 1.3.1.5; SBN 71). But in relying on past experience for matter of fact evidence, we're taking the uniformity principle for granted. As Hume notes, "[w]e can at least conceive a change in the course of nature" (T 1.3.6.5; SBN 89). Accordingly, the contrary of any matter of fact is at least conceivable, which means the falsity of any proof is conceivable. Consequently, all matter of fact judgments—including the proofs of causal reasoning—fall short of the certainty characteristic of knowledge. Put differently, though we have no reason to *doubt* a proof, i.e., past experience supplies no evidence against it, we cannot say that any proof is *demonstratively certain*. Hence, to say that something is *causally certain* is to say only that it is "free from uncertainty" insofar as past experience affords no evidence against it.

While causal judgments are made on the basis of uniform evidence from past experience, probable judgments are grounded on non-uniform, *contrary* evidence. So while proofs are free from doubt, Hume contends that there is "an original uncertainty inherent" in probable reasoning (T 1.4.1.6; SBN 182). Indeed, Hume tells us that "[b]y probability, [I mean] that evidence, which is still attended with uncertainty" (T 1.3.11.2; SBN 124). This description marks Hume's first sense of "probability," where the term refers to a source of uncertainty. However, Hume goes on to make this more precise by distinguishing between "philosophical" and "unphilosophical" sources of uncertainty (T 1.3.13.1; SBN 143).

"Probability" refers to a philosophical source of uncertainty just in case the uncertainty is attributable to the nature of the evidence, e.g., a set of non-uniform evidence.[8] Where the evidence itself is a source of uncertainty, a judgment proportioned to it reflects the uncertain nature of the evidence and, thus, is "philosophical."[9] For instance, when we toss a die, we're uncertain about which side will turn up because any of the six sides might turn up. But in such cases, the uncertainty is attributable to the nature of the evidence, e.g., six equally possible but mutually exclusive outcomes. Accordingly, when we judge that the likelihood of any particular side turning up is 1/6, our judgment is proportioned to the evidence and reflects its uncertain, non-uniform nature. So we can say that non-uniform evidence is a philosophical source of uncertainty (i.e., a "probability") insofar as it grounds judgments proportioned to the evidence that reflect its non-uniform nature. Because of this, philosophers accept philosophical sources of uncertainty as "reasonable foundations of belief and opinion" (T 1.3.13.1; SBN 143).

On the other hand, "probability" refers to an unphilosophical source of uncertainty just in case the uncertainty is attributable to human nature, e.g., human limitations of memory or concentration. For instance, our judgments reached by complex reasoning are often uncertain because we have difficulty following complex chains of reasoning, no matter how "infallible the connexion of each link may be esteem'd" (T 1.3.13.3; SBN 144).[10] As a result, Hume contends

[8] Hume identifies, but says little about, other philosophical sources of uncertainty such as analogy, which I mention here but set aside above (T 1.3.12.25; SBN 142). For discussions of Hume on analogy see: Cohen (1980) pp.226-27, Colman (2001) pp. 199-207, Collier (2005) pp. 24-25, Falkenstein (1997) p. 37, and Garrett (2015) p. 96.

[9] I differ from Garrett (1997) on this point in that he says a source of uncertainty is philosophical insofar as philosophers accept it as a rational ground for belief upon reflection (145). However, it seems clear from Hume's discussion that philosophical sources of uncertainty are so-called because they ground uncertain judgments that are nevertheless proportioned to relevant evidence, which is why they are approved of upon reflection. On the other hand, unphilosophical sources of uncertainty deliver uncertain judgments that are not proportioned to the relevant evidence. Hence, unphilosophical sources of uncertainty are unreasonable "foundations of belief" insofar as they deliver beliefs that are not proportioned to the relevant evidence (T 1.3.13.1; SBN 143).

[10] Hume identifies three other types of unphilosophical probability, which are considered in the next chapter. For now, it is enough to notice that each type of unphilosophical probability is attributable to human nature in the way outlined above.

that "'tis seldom such reasonings produce any conviction" (T 1.3.13.3; SBN 144). In such cases, *human nature* is the source of our uncertainty, which means our uncertainty is not the result of—and does not reflect any—uncertainty in the evidence. Consequently, these uncertain judgments are "unphilosophical" because they are not proportioned to the relevant evidence. So we can say that human nature is an unphilosophical source of uncertainty (i.e., an unphilosophical probability) insofar as it delivers uncertain judgments that aren't proportioned to the relevant evidence. Because of this, philosophers reject unphilosophical sources of uncertainty as reasonable foundations of belief (T 1.3.13.1; SBN 143).

Our concern in this chapter is with philosophical "probability," specifically, the non-uniform evidence of probable reasoning. Non-uniform evidence is a source of uncertainty, or "attended with uncertainty" as Hume puts it, because non-uniform evidence is *contrary* (T 1.3.11.2; SBN 124). A set of evidence is contrary insofar as it includes live possibilities of contrary event-types. Event-types are contrary when they are mutually exclusive such that the existence or occurrence of one event-type implies the non-existence or non-occurrence of the other (T 1.1.5.8; SBN 15).

For instance, past experience affords a proof that a tossed die will turn up only one of its sides to the exclusion of the others. Because a die has six sides, on any given toss there are six live possibilities, viz., the turning up of each side. Because the turning up of one side implies the non-turning up of the others, these six live possibilities are of contrary types. Where live possibilities are of contrary types, they are what I'll call *contrary possibilities*:

> Live possibilities of mutually exclusive event-types such that the occurrence of the one type of event entails the non-occurrence of the other type of event

So a set of contrary evidence is one that includes live possibilities of contrary types. Thus, while causal judgments are grounded on sets of uniform evidence, probable judgments are grounded on sets of non-uniform, contrary evidence.

Still, contrary evidence is a reasonable foundation for our judgments because it's possible to proportion our judgments in accordance it. In particular, Hume identifies two sources of contrary evidence, "*viz.* that which is founded on *chance*, and that which arises from *causes*" (T 1.3.11.3; SBN 125).[11] Because they are sources of contrary evidence, chances and causes are philosophical sources of uncertainty, i.e., probabilities in Hume's first sense. We'll consider what Hume calls "the probability of chances" and "the probability of causes" in turn (T 1.3.11.1, 1.3.12.1; SBN 124, 130).

As Hume describes them, "chances" are associated with predictably unpredictable objects like coins, dice, and roulette wheels. Hume later refers to such objects as "uncertain" objects (T 2.3.9.20; SBN 444). In one respect, uncertain objects are predictable because we've had uniform experience of them, e.g., unsupported coins and dice have always fallen and turned up only one of their sides. But in another respect, uncertain objects are unpredictable in that their configuration or appearance give us reason to expect them to behave in non-uniform ways.[12]

For instance, a coin has two sides but can show only one of them at a time. This is something we notice at first sight and on a first appearance. Uniform past experience affords a proof that unsupported objects fall. So we have a proof that a dropped (or flipped) coin will fall. But because a coin has two sides and can show only one of them at a time, which side will turn

[11] Again (see footnote 8), Hume identifies "analogy" as a philosophical source of uncertainty, but only in passing (T 1.3.12.25; SBN 142). Because Hume only gestures at how analogy informs or grounds probable judgments, our focus will be Hume's focus, viz., chances and causes.

[12] However, things like lotteries, raffles, Three-Card Monte, etc. would also count as predictably unpredictable objects given the "configuration" of these "objects," i.e., the way the games are played.

up when a coin is dropped (flipped) is uncertain. In this respect, Hume says "the object is really in itself uncertain, and to be determin'd by chance" (T 2.3.9.20; SBN 444). However, it's important that the behavior of uncertain objects is predictable in at least some respect.

Our uniform past experience with uncertain objects reveals "a mixture of causes among the chances," and this works to restrict the *relevant* chances (T 1.3.11.6; SBN 125-26). For instance, uniform past experience affords a proof that a tossed die will turn up one side to the exclusion of others and that a ball will come to rest in one and only one slot of a spinning roulette wheel. From uniform past experience, the relevant chances for reasoning about these objects are limited to the sides of the die and the slots of the wheel. Absent this uniform experience, nothing would "limit" the chances, and "[w]here nothing limits the chances, every notion, that the most extravagant fancy can form, is upon a footing of equality" (T 1.3.11.6; SBN 125-26). That is to say, if the behavior of an uncertain object was totally unpredictable, no reasoning and no probable judgment would be possible.

But in light of uniform past experience, the contrary chances associated with uncertain objects are given by the object itself. When faced with such an object, "[t]he mind is here limited by the causes to such a precise number and quality of the events; and at the same time is undetermin'd in its choice of any particular event" (T 1.3.11.6; SBN 126). The mind is "undetermin'd" because the contrary chances associated with an uncertain object are *equal* chances. Hume puts this by saying that a "perfect and total indifference is essential to chance, and one total indifference can never in itself be either superior or inferior to another" (T 1.3.11.5; SBN 125).

With respect to a normal die, the six chances are equal insofar as each side of the die has an equal opportunity of turning up. Because the chances are equal, they get equal weight and consideration in our reasoning:

> When therefore the thought is determin'd by the causes to consider the dye as falling and turning up one of its sides, the chances present all these sides as equal, and make us consider every one of them, one after another, as alike probable and possible. (T 1.3.11.12; SBN 128-29)

However, because only one chance can be actualized on any given toss, these equal chances are also contrary. So with respect to a normal die, the six equal chances are contrary possibilities.

In the die-case, and in relevantly similar cases, Hume traces the uncertainty to the object itself in that it presents us with contrary chances, i.e., live possibilities of contrary types. In this way, sets of contrary possibilities made-up of contrary chances are fixed and restricted by our experience with predictably unpredictable objects (T 1.3.11.3; SBN 125). When faced with a set of contrary possibilities made-up of contrary chances, the evidence is "attended with uncertainty" insofar as the evidence is non-uniform (T 1.3.11.2; SBN 124). Thus, in general, *contrary chances* associated with an uncertain object are a philosophical "probability," i.e., a source of uncertainty, where the uncertainty is attributable to the contrary nature of the evidence.[13]

Probability as a source of uncertainty "arises from *causes*" when what appears to be the same cause has been seen to produce contrary effects (T 1.3.12.4; SBN 131). In such cases, Hume says that while "the object be already certain, yet 'tis uncertain to our judgment, which

[13] To clarify, I've said confirmed possibilities are witnessed events. With respect to chances, the confirmed possibilities are the uniform experiences of the uncertain object. Given these proofs, and the configuration of these objects, we recognize the chances as live possibilities.

finds a number of proofs on each side of the question" (T 2.3.9.20; SBN 444). In other words, it is not the object itself which leads us to expect non-uniform behavior but our experiences of it. We can illustrate Hume's point by considering our experience of the contrary effects of aspirin-ingestion.

At first sight, there is nothing about the appearance or configuration of aspirin that gives us reason to suppose its effects will be non-uniform. In other words, aspirin is not an uncertain object like a die or roulette wheel. However, experience teaches us that most of the time, but not always, aspirin-ingestion relieves a headache. Accordingly, past experience affords positive evidence that aspirin-ingestion will be followed by headache-relief and positive evidence that aspirin-ingestion won't be followed by headache-relief. Considering these two bodies of evidence independently, we have a "proof" on each side of the question. But because these proofs concern the same cause, these bodies of evidence must be considered together:

> [A]s 'tis frequently found, that one observation is contrary to another, and that causes and effects follow not in the same order, of which we have had experience, we are oblig'd to vary our reasoning on account of this uncertainty, and take into consideration the contrariety of events. (T 1.3.12.4; SBN 131)

So the behavior of a *certain* object, i.e., a cause such as aspirin, is uncertain to our judgment in light of contrary experiences of its effects.

Hume calls the contrary effects produced by what appears to be the same cause contrary "experiments" (T 1.3.12.7; SBN 133). Given the uniformity principle, "'tis evident an experiment in the past proves at least a possibility for the future" (T 1.3.12.14; SBN 135). Like contrary chances, individual contrary experiments are *equal* and carry equal weight in our reasoning:

> It has been observ'd, that all single chances are entirely equal…In like manner, as the uncertainty of causes is discover'd by experience…every past experiment has the same weight. (T 1.3.12.15; SBN 136).

Taken together, the contrary experiments associated with a cause (i.e., a certain object) deliver a set of contrary possibilities. A set of contrary possibilities made-up of contrary experiments is "attended with uncertainty" insofar as the evidence is non-uniform (T 1.3.11.2; SBN 124). Thus, in general, *contrary experiments* associated with a cause are a philosophical "probability," i.e., a source of uncertainty, where the uncertainty is attributable to the contrary nature of the evidence.

From here we can give a clearer picture of the contrast Hume intends to mark between the probability of chances and the probability of causes. For objects like aspirin, there is nothing about the object itself that leads us to expect non-uniform effects. This is what Hume means by saying the object is "certain"—absent some reason for thinking otherwise, we expect causes to produce uniform effects. But experience teaches us that certain objects sometimes produce contrary effects, and Hume goes on to say that experience also teaches us that a "contrariety of effects" indicates a "contrariety of causes":

> [P]hilosophers observing, that almost in every part of nature there is contain'd a vast variety of springs and principles…find that 'tis at least possible the contrariety of events may not proceed from any contingency in the cause, but from the secret operation of contrary causes. This possibility is converted into certainty by farther observation, when they remark, that *upon an exact scrutiny, a contrariety of effects always betrays a contrariety of causes, and proceeds from their mutual hindrance and opposition*. (T 1.3.12.5; SBN 132, my emphasis)

More simply, experience reveals that the same cause sometimes fails to produce its usual effect due to the operation of contrary causes. In that case, supposing these contrary causes cease to operate, we'd expect certain objects like aspirin to produce uniform effects, e.g., headache-relief.

Notice we can't say the same thing for uncertain objects. It's not the case that we think a particular side of a die, e.g., the 1, would uniformly turn up were it not for the operation of some concealed cause. Given the nature and configuration of such objects, we're uncertain about one aspect of their behavior on their first appearance.[14] It is in this sense that the outcome of tossing a die is "determin'd by chance" (T 1.3.11.6, 2.3.9.20; SBN 125-26, 444). With respect to an uncertain object, the object itself *presents* the contrary chances and, thus, the object itself is uncertain.

I've taken pains to explain the difference between contrary chances and contrary experiments to draw attention to Hume's first sense of "probability," viz., *probability as a source of uncertainty*. But in explaining judgments made on the basis of contrary evidence, Hume devotes most of his attention to sets of contrary experiments, i.e., sets of contrary possibilities supplied by past experience. In fact, Hume makes clear that what he offers regarding the probability of chances is a means of setting the stage for his central discussion regarding the probability of causes:

> What I have said concerning the probability of chances can serve to no other purpose, than to assist us in explaining the probability of causes; since 'tis commonly allow'd by philosophers, that what the vulgar call chance is nothing but a secret and conceal'd cause.

[14] Plinko is good example here. Nobody had heard of or seen the game Plinko until it was played on The Price is Right in 1983. Yet, from merely looking at the inclined Plinko board with its rows of pegs and individual slots at the bottom, we knew that a dropped "chip" would "plink" along the pegs and come to rest in one slot to the exclusion of the others. In other words, on the basis of our uniform experiences, in one respect the Plinko game was predictable at first sight. But in another respect, the Plinko game was unpredictable in that we could not be sure which slot would ultimately hold the dropped plinko-chip.

> That species of probability, therefore, is what we must chiefly examine. (T 1.3.12.1; SBN 129)[15]

In general, probable reasoning is marked by sets of non-uniform evidence which are "attended with uncertainty" insofar as they are made-up of contrary possibilities (T 1.3.11.2; SBN 124). Determining whether the evidence is made up of contrary chances or contrary experiments answers a question about the source of the uncertainty, viz., the object itself or our experiences of it. Apart from this question, as the foregoing passage suggests, Hume takes it that we treat sets of contrary possibilities in the same way. Given Hume's focus, when I talk of "probable reasoning" I'll mean reasoning with respect to sets of contrary possibilities supplied by past experience unless otherwise indicated.

V. A First Pass at Weighing Matter of Fact Evidence

Having sorted out the evidence for matter of fact reasoning, we now need to say how consideration of that evidence grounds our causal and probable judgments. A natural way to think about probable reasoning, and matter of fact reasoning generally, suggests itself to contemporary eyes and was hinted at in the last section. Most of us are taught how to calculate relatively simple probabilities at an early age with games of chance. On the basis of this teaching, we judge that the odds of turning up heads on a coin-flip is 1/2, that the likelihood of drawing an ace is 1/13, and that the probability of a ball coming to rest in a slot of a roulette wheel is 1.[16] One way to capture this is to say we learned how to calculate probabilities by determining the proportions of chances for different types of possible outcomes. In appealing to

[15] Here Hume seems to hint that the probability of chances is a kind of especially complicated probability of causes where the operation of concealed causes is especially complex, which is why the outcomes are said to be determined by chance.

[16] Of course we make these judgments with certain background assumptions in place.

sets of contrary chances and experiments, Hume clearly has the tools for making such calculations. So as a first pass, perhaps we should say that we calculate "probabilities" (in a sense to be defined below) by determining proportions of contrary possibilities with respect to sets of contrary evidence.

On this reading, to determine the likely effect of aspirin-ingestion, all we need to do is determine the number of times aspirin ingestion relieved a headache in the total number of ingestions. For things like dice, all we need to do is calculate the number of chances for a given event-type in the total number of chances. On this basis, we can say that, for any side of a normal die, the likelihood that it will turn up is 1/6. What's more, by adding these likelihoods together we can say that the probability of at least one side turning up is 1. Notice that this seems to give us something like the distinction Hume is concerned to make between causal judgments on the one hand and probable judgments on the other. That is, we have a proof that *some* side will turn up, e.g., a probability of 1, but uncertainty about *which* side will turn up, e.g., a likelihood of 1/6 for each side.[17]

Understood in this way, probable reasoning is a mechanism for assigning a number to an event-type where that number expresses a measurement of the evidence for that type of event. These determinations ground familiar estimates of likelihood and relational judgments about which types of events are more, less, or equally likely compared to others. From a contemporary point of view, it's important to see that Hume has the tools to make these determinations and assignments. But explaining estimates of likelihood for probable events is not Hume's central

[17] Obviously, since I've said that demonstrative certainty is beyond our reach in judging matters of fact, for Hume, a probability scale ranging from 0 to 1 cannot mark necessity at either the top or bottom of the scale. Rather, the scale would have to track something like assurance, e.g., full assurance at the top and no assurance at the bottom. For a discussion of a Humean probability scale see especially: Cohen (1980), Coleman (2001), and Vanderburgh (2005).

concern with probable reasoning. Put simply, Hume's concern is to explain how we make a judgment about an *event* rather than a judgment about the *likelihood* of an event.

Hume makes this clear by distinguishing between different sorts of questions we might be concerned to answer regarding the merely probable. First, we might be wondering about the chances, odds, or likelihoods for particular event-types. This is a question about the evidence, i.e., the proportions of chances or experiments, for different types of events (T 1.3.11.8, 1.3.12.10-11; SBN 127, 134). The second type of question concerns what, if anything, we ought to presently believe in the face of contrary evidence. This is a question about whether a set of contrary evidence is such that it grounds belief for one type of event over an event of a contrary type (T 1.3.11.8, 1.3.12.8; SBN 127, 133-34).

The latter sort of judgments, being grounded on contrary evidence, can never be certain. However, judgments of the former sort, which are made by determining proportions, may well be candidates for certainty. Hume grants this much when he imagines someone making the following claim:

> [T]ho' in an opposition of chances 'tis impossible to determine with *certainty*, on which side the event will fall, yet we can pronounce with certainty, that 'tis more likely and probable, 'twill be on that side where there is a superior number of chances, than where there is an inferior. (T 1.3.11.8; SBN 127, Hume's emphasis)

Here the imagined challenger concedes that merely probable events are uncertain. Even so, we may well agree on *what* the evidence is for some merely probable event. In that case, we can also agree that it's possible to be certain about the *likelihoods* of merely probable events and, thus, about which events are more or less probable than others. So while I can't be sure that a number below six will turn up, I may well be certain that the likelihood of a six turning up is 1/6

and that the likelihood of a number below six turning up is 5/6. What's more, because it's possible to be certain that 5/6 is greater than 1/6, it's possible to be certain that "'tis more likely and probable" that a number below six will turn up.

While this may seem an initially surprising concession—the possibility of Humean certainty about the merely probable—it follows from the way in which these latter judgments are made. Recall that we have a precise standard for judging the constant relation of proportions of quantity and number (T 1.3.1.2-3, 1.3.1.5; SBN 70,71). When probable judgments are rendered as judgments of proportions of chances or experiments, certainty is possible because we're merely reporting what the evidence is:

> The likelihood and probability of chances is a superior number of equal chances; and consequently when we say 'tis likely the event will fall on the side, which is superior, rather than on the inferior, we do no more than affirm, that where there is a superior number of chances there is actually a superior, and where there is an inferior there is an inferior; which are identical propositions, and of no consequence. (T 1.3.11.8; SBN 127)

In other words, when we express a probable judgment in terms of proportions of contrary possibilities, we merely give an accounting of the evidence. So when we say that one type of event is "more probable" than another, we're merely saying that the number of live possibilities of that type is greater than the number of live possibilities of a contrary type. Then to be *certain* that one event is more probable than another, is to be certain that, for instance, 5/6 is greater than 1/6. But all we've said here is that, with respect to a set of contrary evidence, where the live possibilities of one type outnumber the live possibilities of a contrary type, there is a greater number of the former type than there is of the latter type—a judgment Hume deems "of no consequence."

While we've been focused on assessments of live possibilities insofar as they are contrary chances, we can say something similar for live possibilities insofar as they are contrary experiments. For instance, suppose we're wondering about the effects of aspirin-ingestion:

> If our intention, therefore, be to consider the proportions of contrary events in a great number of instances, the images presented by our past experience must remain in their *first form*, and preserve their first proportions. (T 1.3.12.11; SBN 134, Hume's emphasis)

Suppose that by reflecting on the relevant past experience I recall twenty times where aspirin-ingestion was followed by headache relief and only five where it was not. On the basis of this contrary evidence, I'm able to judge that the likelihood of aspirin-ingestion relieving a headache is 4/5 and that the likelihood of aspirin-ingestion failing to relieve a headache is 1/5. "Concerning this," Hume says, "there can be no difficulty"—it merely requires determining the proportions of contrary possibilities (T 1.3.12.11; SBN 134).

In making these judgments, Hume claims we recognize that "[a]ny of these past events may again happen; and we *judge*, that when they do happen, they will be mix'd in the same proportion as in the past" (T 1.3.12.10; SBN 134, my emphasis). In other words, these judgments express long-run expectations that aspirin-ingestion will be followed by headache relief 4/5 of the time and that it won't be followed by headache relief 1/5 of the time. If we can be certain that 4/5 is greater than 1/5, then it's possible to be certain that headache-relief is more probable than not.

But the possibility of certainty in such cases is a possibility of certainty about *counting*, viz., that the number of live possibilities of one type is superior to the number of live possibilities of a contrary type. And Hume claims this is all we mean in saying that one type of event is "more likely and probable" than another. While reserving a place for these judgments, Hume

suggests they're well understood, which is why they are of "no consequence" and present "no difficulty" (T 1.3.11.8, 1.3.12.11; SBN 127, 134).[18] What Hume takes to be novel about his approach to probable evidence is that he's answering a different question: *What, if anything, should we presently believe in the face of contrary evidence?*

Given this focus, we aren't interested in saying what the proportions of contrary possibilities *are* but, rather, *whether* they ground present belief. Hume marks this shift in focus in setting-up his examination of the probability of chances:

> The question is, by what means a superior number of equal chances operates upon the mind, and produces belief or assent; since it appears, that 'tis neither by arguments deriv'd from demonstration, nor from probability. (T 1.3.11.8; SBN 127, Hume's emphasis)

Hume reiterates this aim in framing his discussion of the probability of causes where we confront contrary evidence from past experience:

> Here then are two things to be consider'd, *viz.* the *reasons* which determine us to make the past a standard for the future, and the *manner* how we extract a single judgment from a contrariety of past events. (T 1.3.12.8; SBN 133-34, Hume's emphasis)

We've already gestured at Hume's answer to why we make the future the standard of the past—from habit and custom, we expect the future to resemble the past (T 1.3.12.9; SBN 134). The second thing to be considered spotlights Hume's central concern, viz., explaining how we come to *believe* that a merely probable event will occur on the basis of contrary evidence.

One way to characterize this shift in focus is to say that Hume is concerned to account for our degree of assurance for merely probable events rather than our estimates of their likelihood.

[18] For instance, regarding chances Hume says that the mark of chance is indifference, and he adds that this "truth is not peculiar to my system, but is acknowledg'd by every one, that forms calculations concerning chances" (T 1.3.11.5; SBN 125). This expresses a recognition of, and familiarity with, calculations of equal chances expressed in terms of proportions of chances of the same type.

Still, what we've said about likelihoods appears to supply a framework for explaining degrees of assurance for probable events. For instance, there's one chance that a 6 will turn up when a die is tossed and five chances that it won't. Accordingly, the likelihood of a 6 turning up is 1/6. Given its likelihood, it stands to reason that we ought to judge with 1/6 full assurance (or belief or confidence or vivacity) that a 6 will turn up. Then elaborating on our first pass, perhaps we should say that, with respect to sets of contrary possibilities, the proportions of contrary possibilities ground proportional degrees of assurance for judgments about merely probable events. More simply, where an event-type's likelihood is *p*, this grounds a degree of assurance of *p* for that event-type.

Something fitting this general picture is what most commentators offer as an explanation of Hume on probable reasoning.[19] Robert Fogelin (1985) explains the relation between likelihoods and degrees of assurance by noting that, "a degree of belief [or assurance is] proportioned to the ratio of one kind of case to the total number of cases," which in turn shows how "Hume can assign a statistical probability to a single event" (59-60). Fogelin (2009) helpfully illustrates this approach with an example of a six-sided die: "there are six equally likely outcomes from casting the die, so the vivacity level for each face of the die coming up is 1/6…[which] is the probability we will naturally assign to the possibility that the die will come up, say, 4" (21).

Antonia LoLordo (2000) argues for a similar link, concluding that, "[i]n general, if *x* is the outcome which is, so far as we know, the most frequent or probable in the standard contemporary sense, then we believe that *x* will happen with a strength proportional to its frequency or probability" (431). We find something like this in Don Garrett (1997) as well,

[19] Gower (1990) (1991), Maher (1981), and Vanderburgh (2005) are notable exceptions.

when he suggests that "a degree of vivacity" or assurance, "corresponds to the proportion of concurring views [i.e., live possibilities of the same type] among all of the views" (143). In later work, Garrett (2006) gives a similar but more detailed summary of his account:

> Let "standard degree of assent" designate the degree of assent (i.e., force and vivacity) that a particular judgment would have *if* it were produced by straightforward reasoning in normal circumstances. Thus, if the judgment is the result…of a genuine "proof," then the full degree of assent characteristic of proof; if the result of what Hume calls 'the probability of chances,' then a degree of assent proportionate to the number of positive chances in the total number of chances…and if the judgment is the result of the probability of causes, then the degree of assent proportionate to the number of experienced positive instances in the total number of experienced instances. (161-62, Garrett's emphasis)

So a prevalent suggestion is that, for Hume, degrees of assurance for probable judgments are fixed in accordance with proportions of contrary possibilities.

From here, as Fogelin's explanation suggests, we can broaden the account while at the same time making it more precise. We can say that, in general, a "probability" is a number expressing either an estimate of likelihood or a measure of one's degree of assurance for some matter of fact. In each case, we calculate this number by determining the number of live possibilities of the same type in the total number of contrary possibilities. When assigned to an event, this number expresses a long-run estimate of likelihood for that event-type. When associated with (or assigned to) a judgment, this number expresses a measure of our degree of assurance regarding the occurrence of an event of that type.

While the foregoing has proved to be an influential interpretation of Hume on probable reasoning, it is, at best, incomplete. For starters, while Hume employs three senses of

"probability," he never uses the term in reference to a number assigned as a measure of likelihood or degree of assurance. What's more, determining proportions of contrary live possibilities is just one step in a procedure Hume develops for making probable judgments about single events. And Hume makes clear that merely determining the proportions of contrary possibilities fails to deliver the target judgments:

> When we transfer contrary experiments to the future, we can only repeat these contrary experiments with their particular proportions; which cou'd not produce assurance *in any single event*, upon which we reason. (T 1.3.12.22; SBN 138-40, my emphasis)

In short, merely determining the proportions of experiments fails to ground a probable judgment of the sort Hume is concerned to explain, viz., *a single-event judgment*.

We can illustrate the central problem for the influential interpretation with our die example. On any particular toss of the die, only one type of live possibility—*a single event*—will be actualized. If we enlist our long-run conclusions to judge a single case, as the influential interpretation suggests, we either fail to make a decision about a single event or we end up with contradictory expectations. For one thing, judgments of likelihood are relational, so when we judge that the likelihood of a number below six turning up is 5/6, we also have it that the likelihood of a six turning up is 1/6. Consequently, determining the proportions of live possibilities fails to deliver a judgment about a single event. What's more, we know that a six *and* a number below six cannot turn up on a single toss—"the events are contrary, and 'tis impossible both these figures can be turn'd up" (T 1.3.11.13; SBN 130). So if we rely on proportional judgments to ground expectations and beliefs in a single case, we end up with contradictory expectations, viz., that *a six will turn up*, that *a number below six will turn up*, and that *only one side will turn up*.

To emphasize the point, I've left out of consideration that the contrary events will be expected with differing degrees of assurance. Admittedly, these differing degrees of assurance make all of the difference for our long-run expectations. There's no contradiction in saying that, in the long-run, we expect aspirin-ingestion to relieve a headache 4/5 of the time and that it won't 1/5 of the time. From a contemporary point of view, we might add that with respect to a particular aspirin-ingesting, there's no conflict in reporting a credence level of 4/5 that it will be followed by headache-relief and a credence level of 1/5 that it won't be followed by headache-relief.

While this last point looks to avoid the charge of contradictory expectations, I take it Hume would say that this is either not a judgment about a single event or that it's a case where we're actually *undecided* about what will happen. First, to consider *contrary* events is to consider two events rather than a single event. Second, to have expectations for contrary events but with different degrees of assurance is, at best, to be undecided about which single-event will occur. This indecision might seem to be just what is called for when faced with contrary evidence. But to get Hume right, we need to distinguish a probable judgment where we're *undecided* about which event will occur from an *uncertain* probable judgment *that* a particular event will occur. Hume argues that a probable judgment about a single-event is uncertain because, on the basis of contrary evidence, we've judged, i.e., *made a decision*, that it will presently occur. And in a single case, to judge or expect that mutually exclusive events will presently occur is to have contradictory judgments or expectations, regardless of their differing degrees of assurance (T 1.3.11.13; SBN 130).

To avoid the contradiction, we might just opt for whatever event-type has the highest likelihood. I take it LoLordo (2000) has something like this in mind by suggesting that we

believe whatever is most probable in a "standard contemporary sense" with a degree of assurance "proportional to its frequency or probability" (431). But to simply judge with a degree of assurance proportional to the event-type with the highest likelihood would be to arbitrarily ignore relevant evidence. For instance, to judge that a number below five will turn up with 5/6 full assurance would amount to setting aside or simply ignoring the live possibility that a six will turn up. In that case, the resultant judgment wouldn't be proportioned to the *all* of the relevant evidence. As we'll see in the following sections, rather than avoiding the contradiction, Hume develops a procedure that *resolves* the contrariety in the evidence to deliver a single-event judgment proportioned to the evidence. Accordingly, the suggestion that determining proportions of contrary possibilities exhausts Hume's account of probable reasoning, whether these are understood as measures of likelihood or degrees of assurance, is mistaken.

VI. Interlude: Distinguishing Direct Reasoning from Indirect Reasoning

As Hume develops it, single-event probable reasoning is a mechanism for determining what, if anything, we should presently believe in the face of contrary evidence. In other words, Hume is concerned to develop an account of how we make a judgment about a single event where past experience supplies conflicting evidence about whether such an event will presently occur. However, before turning to Hume's novel approach to single-event judgments, we need to address a further obstacle to interpreting Hume on probable reasoning.

Though it isn't often marked, Hume actually provides two accounts of single-event matter of fact judgments.[20] The first explains a judgment as the product of what I'll call "direct"

[20] As far as I know, David Norton (1982) is the first, and one of the few, interpreters to highlight this feature of Hume's approach to probable reasoning. Norton makes the distinction in terms of "reflexive" and "reflective" reasoning, but the upshot is similar to what I outline above (see pp. 209-10). The reasons for my choosing "direct"

reasoning. With direct reasoning, matter of fact judgments follow directly from custom and habit, which is to say, without any conscious effort on our part:

> 'Twill here be worth our observation, that the past experience, on which all our judgments concerning cause and effect depend, may operate on our mind in such an insensible manner as never to be taken notice of, and may even in some measure be unknown to us… The custom operates before we have time for reflection…But as this transition proceeds from experience…we must necessarily acknowledge, that experience may produce a belief and a judgment of causes and effects by a secret operation, and without being once thought of. (T 1.3.8.13; SBN 103-04)

Indeed, Hume suggests our casual judgments, which are grounded on the uniform evidence of past experience, are often made without any reflection:

> In general we may observe, that in all the most establish'd and uniform conjunctions of causes and effects, such as those of gravity, impulse, solidity, &c. the mind never carries its view expressly to consider any past experience. (T 1.3.8.14; SBN 104-05)

So our judgments regarding the most "established and uniform" events, tend to follow directly from custom and habit. Accordingly, our most familiar causal judgments are (often) produced by direct reasoning. In general, where our judgments follow directly from custom and habit, they are the products of *direct* reasoning.

Hume's second account explains a single-event judgment as the product of what I'll call "indirect" reasoning. Indirect reasoning delivers matter of fact judgments through a conscious selection and weighing of the evidence from past experience. In such cases, Hume says that "reflection" assists the custom:

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and "indirect" will become clear below, though the short answer is that this is Hume's usual way of making the distinction.

> [I]n other associations of objects, which are more rare and unusual, [the mind] may assist the custom and transition of ideas by this reflection. Nay we find in some cases, that the reflection produces the belief without the custom; or more properly speaking, that the reflection produces the custom in an *oblique* and *artificial* manner… [Thus, in] all cases we transfer our experience to instances, of which we have no experience, either *expressly* or *tacitly*, either *directly* or *indirectly*. (T 1.3.8.14; SBN 104-05, Hume's emphasis)

So in the most familiar cases, our judgments are often the direct result of custom and habit. But in the less familiar, more novel cases, reaching a judgment requires conscious reflection on the evidence afforded by past experience.

Given these two ways of arriving at single-event judgments, we need to be clear as to whether we're talking about direct or indirect reasoning. Hume contends that many of our causal judgments are the result of direct reasoning while allowing that some are the result of indirect reasoning. Precisely the converse is claimed for probable judgments grounded on contrary evidence. While Hume admits that these judgments might sometimes follow directly from habit, he claims this is the exception rather than the rule (T 1.3.12.6-7; SBN 132-33). In other words, it's true that some of our probable judgments arise directly from custom and habit as a result of contrary experience, i.e., they follow from direct reasoning. But on the whole, Hume takes it that arriving at single-event judgments on the basis of contrary evidence requires reflecting on, selecting, and weighing the evidence from past experience:

> When we follow only the habitual determination of the mind, we make the transition without any reflection, and interpose not a moment's delay betwixt the view of one object and the belief of that, which is often found to attend it. As the custom depends not upon any deliberation, it operates immediately, without allowing any time for reflection. But this

> method of proceeding we have but few instances of in our probable reasonings; and even fewer than in those, which are deriv'd from the uninterrupted conjunction of objects. In the former species of reasoning we commonly take knowingly into consideration the contrariety of past events; we compare the different sides of the contrariety, and carefully weigh the experiments, which we have on each side: Whence we may conclude, that our reasonings of this kind arise not *directly* from the habit, but in an *oblique* manner; which we must now endeavour to explain. (T 1.3.12.7; SBN 133, Hume's emphasis)

So we need to keep in mind that when Hume talks of our most "solid" causal judgments, he usually means *judgments arising directly from habit*. But when Hume is talking about probable judgments made on the basis of contrary evidence, he usually means *judgments arising indirectly from habit as a result of weighing the contrary evidence afforded by past experience.*

I've paused to highlight this point to avoid being misunderstood and to discourage the temptation to understand Humean probable reasoning solely in terms of custom and habit. It happens that we might appear to disagree about Hume on probable reasoning due to talking past one another. For instance, I might express things in terms of indirect reasoning but be understood in terms of direct reasoning. We've now seen that Hume clearly stakes out the view that probable reasoning is usually active rather than passive, indirect rather than direct. We *reflect* on and *compare* the contrary evidence from past experience. We knowingly *consider* and carefully *weigh* that evidence. Accordingly, our probable judgments are usually the *indirect* result of custom and habit where our activities as reasoners *assist* the custom. So in what follows, when I talk of "probable reasoning," it is this sort of active, indirect reasoning that I have in mind.

VII. Hume's Second Sense of "Probability": A Superiority of Evidence

We've said that contrary evidence is a philosophical source of uncertainty, viz., a "probability" in Hume's first sense. As Hume casts it, a set of contrary evidence grounds a single-event judgment *only if* a majority of the live possibilities are of the same type. This marks Hume's second, and favored, sense of "probability," viz., *probability as a superiority of evidence*. More carefully, with respect to a set of contrary evidence, a "probability" in Hume's second sense refers to a subset of live possibilities of the same type that make up a majority of the evidence.

Recall that with respect to a set of contrary evidence, individual live possibilities are equal and carry equal evidential weight in our reasoning. Hume expresses this by saying that "no one chance can possibly be superior to another" (T 1.3.11.5; SBN 125). While individual live possibilities are equal, one *type* of live possibility may be superior to another type just in case "it is compos'd of a superior number" of live possibilities (T 1.3.11.5; SBN 125). In other words, two live possibilities of the same type constitute a stronger, *superior* type of evidence than a single live possibility of a contrary type:

> It has been observ'd, that all single chances are entirely equal, and that the only circumstance, which can give any event, that is contingent, a superiority over another, is a superior number of chances. In like manner, as the uncertainty of causes is discover'd by experience, which presents us with a view of contrary events…every past experiment has the same weight, and that 'tis only a superior number of them, which can throw the ballance on any side. (T 1.3.12.15; SBN 136)

So one type of live possibility is superior to another type of live possibility only where there is a superior number of live possibilities of the former type. Where this superiority constitutes a

majority of the evidence with respect to a set of contrary evidence, it is a probability in Hume's second sense.[21]

For instance, suppose we have a die with four black sides and two white sides. On a single toss, there are four live possibilities that black will turn up and only two live possibilities that white will turn up. In this case, the live possibilities that black will turn up "compose" a *probability* (T 1.3.12.17; SBN 136-37). Likewise, suppose reflection on past experience supplies a set of contrary evidence that includes twenty recollected events where aspirin-ingestion was followed by headache relief and only five where it was not. Because a majority of the live possibilities are of the same type, this set of evidence includes a probability, viz., a superiority of one type of live possibility compared to a contrary type. In general, where we have a superiority of evidence such that one type of live possibility outnumbers the live possibilities of a contrary type(s), we have a *probability*.

Because the evidence for probable reasoning is contrary, Hume remarks that "there is no probability so great as not to allow of a contrary possibility; because otherwise 'twou'd cease to be a probability, and wou'd become a [causal] certainty" (T 1.3.12.14; SBN 135). Mere possibilities are consistently conceivable but unexperienced event-types that carry no evidential weight in matter of fact reasoning. So when Hume talks of a "contrary possibility" he's referring to one or more live possibilities of a type that is contrary to that which composes the probability. Accordingly, where a set of probable evidence includes a probability, it also includes what Hume calls an "opposite possibility":

[21] This also explains what Hume means when he says that causal arguments "exceed probability, and may be receiv'd as a superior kind of evidence" (T 1.3.11.2; SBN 124). Causal arguments are grounded on sets of uniform evidence where the live possibilities are all of the same type. Because there is no contrariety in the evidence, it *exceeds* and, thus, constitutes *a superior kind of evidence* compared to the contrary evidence of probable reasoning.

> To every probability there is an opposite possibility. This possibility is compos'd of parts, that are entirely of the same nature with those of the probability…The only manner then, in which the superior number of similar component parts in the one can exert its influence, and prevail above the inferior in the other, is by producing a stronger and more lively view of its object. (T 1.3.12.17; SBN 136-37)

One reason it has proven difficult to get Hume right is that he uses the terms "probability" and "possibility" in these unfamiliar ways. But once we see that they are technical terms for Hume, where the former refers to a superior type of evidence and the latter refers to an inferior type of evidence, we begin to make progress on Hume's account of probable reasoning.

A "probability" is so-called because it is composed of a superior number of live possibilities compared to an inferior number that compose the opposite possibility. It is this sense of probability that Hume has in mind when he says that the "probability of chances is a superior number of equal chances" (T 1.3.11.8; SBN 127). It is also the sense Hume has in mind when he says that by affirming a probability with respect to a set of contrary evidence, "we do no more than affirm, that where there is a superior number of chances there is actually a superior, and where there is an inferior there is an inferior" (T 1.3.11.8; SBN 127).

I call the opposite possibility composed of an inferior number of live possibilities, the "rival possibility" or a probability's "rival." Both a probability and its rival are made-up of live possibilities, which Hume acknowledges by saying that their "parts" are of "the same nature":

> The component parts of this possibility and probability are of the same nature, and differ in number only, but not in kind…The possibility, therefore, which enters into every reasoning of this kind, is compos'd of parts, which are of the same nature both among themselves, and with those, that compose the opposite probability. (T 1.3.12.15; SBN 136)

Insofar as a probability and its rival are composed of live possibilities, they are of the same nature. But insofar as a probability is composed of a superior number of live possibilities, a probability and its rival differ in number. Hence, probabilities and their rival(s) differ in number but not in kind.

Being of the same nature, a probability and its rival have the same "influence" on our judgment (T 1.3.12.17; SBN 136-37). As a result, when faced with a set of contrary evidence that includes a probability and its rival, we're initially inclined toward contradictory judgments, e.g., *aspirin-ingestion will relieve a headache* and *aspirin-ingestion will not relieve a headache*. So at an intermediate stage in our probable reasoning about a single event, Hume claims we're inclined toward "contrary" beliefs:

> [A rival] possibility is compos'd of parts, that are entirely of the same nature with those of the probability; and consequently have the same influence on the mind and understanding. The belief, which attends the probability, is a compounded effect, and is form'd by the concurrence of the several effects, which proceed from each part of the probability…[E]ach part of the [rival] possibility must have the same influence on the opposite side; the nature of these parts being entirely the same. The contrary belief, attending the [rival] possibility, implies a view of a certain object, as well as the probability does an opposite view. (T 1.3.12.17; SBN 136-37)

Because a probability and its rival have the same influence on our judgment, stopping our reasoning at this point would leave us with contradictory beliefs about a single case. This was the problem we identified with supposing that single-event probable judgments are proportional to the contrary possibilities in a set of contrary evidence.

However, Hume makes clear that this is an intermediate stage of single-event probable reasoning rather than its conclusion:

> 'Tis indeed evident, that in all determinations, where the mind decides from contrary experiments, *'tis first divided within itself*, and has an inclination to either side in proportion to the number of experiments we have seen and remember. *This contest is at last determin'd to the advantage of that side, where we observe a superior number of these experiments*; but still *with a diminution of force in the evidence correspondent to the number of the opposite experiments*. (T 1.3.13.20; SBN 154-55, my emphasis)

Noting that we're inclined "at first" toward contrary judgments proportioned to the contrary possibilities in a set of contrary evidence marks that our reasoning is not yet completed. To make a judgment about a single event, we must move beyond this intermediate stage to resolve the contrariety and settle the "contest" between competing types of evidence.

Probable reasoning that resolves the contrariety in a set of evidence marks Hume's third, and final, sense of "probability," viz., *probability* as "reasoning from conjecture" (T 1.3.11.3; SBN 124-25). We reason from conjecture when, on the basis of contrary evidence, we reason about a single event. So "probability" in Hume's third sense refers to the type of single-event probable reasoning he's concerned to articulate. From here, we can show how Hume's three senses of probability are related.

"Probability" as a philosophical source of uncertainty, refers to the sets of contrary evidence that ground probable judgments in general and single-event judgments in particular. Contrary evidence grounds a judgment about a single event only where the evidence favors one type of event over another. "Probability" as a superiority of evidence refers to a collection of live possibilities of the same type that make-up a majority of the evidence with respect to a set of

contrary evidence. "Probability" as reasoning from conjecture, refers to a process of single-event probable reasoning that resolves the contrariety in a set of contrary evidence. What remains to be explained is Hume's process of single-event probable reasoning whereby we make a judgment about "one single event, which appears uncertain" (T 1.3.12.11; SBN 134-35).

VIII. Unpacking Hume's Third Sense of "Probability": Reasoning from Conjecture

We said that, in general, an impression of sensation or memory is the foundation for matter of fact reasoning. For probable reasoning in particular, Hume emphasizes the role of a present impression as a point of contrast with demonstrations that target relations of ideas:

> PROBABILITY, as it discovers not the relations of ideas, consider'd as such, but only those of objects, must in some respects be founded on the impressions of our memory and senses, and in some respects on our ideas…'Tis therefore necessary, that in all probable reasonings there be something present to the mind, either seen or remember'd; and that from this we infer something connected with it. (T 1.3.6.6; SBN 89)[22]

An impression that is "present to the mind" supplies the assurance for our inferences about "something connected with it." So without a present impression, matter of fact arguments would leave us with no belief or assurance (T 1.3.4.2; SBN 83). Hume makes just this point regarding hypothetical arguments, from which "no belief nor evidence" follows because they include "neither any present impression, nor belief of a real existence" (T 1.3.4.2; SBN 83). Hence, an

[22] To avoid confusion, in the text I've omitted Hume's last remark but reproduce it here: "'Tis therefore necessary, that in all probable reasonings there be something present to the mind, either seen or remember'd; and that from this we infer something connected with it, which is not seen nor remember'd" (T 1.3.6.6; SBN 89). An inference to something which is "not seen nor remember'd" is a judgment grounded on the evidence from past experience that an unwitnessed event either has occurred or will occur.

impression of sensation or memory that supplies the *preliminary* assurance for our reasoning is the *necessary* "foundation" of matter of fact reasoning.

Recall that past experience is the only source of evidence for matter of fact reasoning because experience is the only way for us to discover causal relations:

> In all those instances, from which we learn the conjunction of particular causes and effects, both the causes and effects have been perceiv'd by the senses, and are remember'd; But in all cases, wherein we reason concerning them, there is only one perceiv'd or remember'd, and the other is supply'd in conformity to our past experience. (T 1.3.6.2; SBN 87)

Hume echoes this point in explaining how we make probable judgments after experiencing contrary effects follow from what appears to be the same cause:

> [A]s past experience regulates our judgments concerning the possibility of these effects, so it does that concerning their probability; and that effect, which has been the most common, we always esteem the most likely. (T 1.3.12.8; SBN 134)[23]

Thus, for Hume, two necessary components of matter of fact reasoning in general, and probable reasoning in particular, are a present impression and a set of evidence supplied by past experience.[24]

For a particular occasion of matter of fact reasoning, our selection of evidence is informed by our present aims and circumstances. The evidence we select is a subset of

[23] Again, when Hume says "most likely" he means insofar as it is the event favored by a superior number of live possibilities.

[24] Recall that Hume's focus and, thus, our focus, is on the probability of causes, i.e., uncertainty associated with contrary "experiments." Still, when reasoning about contrary chances, a present impression is necessary to supply the preliminary assurance for our reasoning. From uniform past experience with one respect of an "uncertain object" such as a die, we are fully assured that it will fall and turn up only one side. The difference between the probability of chances and the probability of causes is in how the contrary evidence is supplied. With an uncertain object we are *presented* with contrary chances whereas we *select* contrary experiments from past experience with respect to a "certain object." But in each of these cases, a present impression supplies the preliminary assurance for our reasoning.

experienced events, which are *confirmed possibilities* that we presently recognize as *live possibilities*. Individual live possibilities are equal and carry equal evidential weight in our reasoning. Accordingly, preliminary assurance from a present impression is apportioned equally among the live possibilities so that "each partakes an equal share of that force and vivacity, that is deriv'd from the impulse" (T 1.3.12.10; SBN 134). Consequently, each live possibility secures an equal share of the preliminary assurance from a present impression (T 1.3.11.12, 1.3.12.10; SBN 129, 134).

Where a set of contrary evidence includes a majority of live possibilities of the same type, it includes a probability and a rival possibility. On the way to making a judgment about a *single* event, live possibilities of the same type are collected together:

> When we transfer contrary experiments to the future, we can only repeat these contrary experiments with their particular proportions; which cou'd not produce assurance in any single event, upon which we reason, unless the fancy melted together all those images that concur, and extracted from them one single idea. (T 1.3.12.22; SBN 139-40)

At this intermediate stage, collecting live possibilities of the same type together leaves us with contrary beliefs—a belief proportioned to the number of live possibilities that compose the probability and a contrary belief proportioned to the number of live possibilities that compose its rival (T 1.3.12.17; SBN 137).

To resolve the contrariety in the evidence, Hume proposes what I'll call a "balancing procedure," where live possibilities of contrary types and their apportioned assurance cancel. Hume often describes balancing and cancellation in combative terms. For instance, we're told that "as the events are contrary, and 'tis impossible both [can occur]; the impulses likewise become contrary, and the inferior *destroys* the superior, as far as its strength goes" (T 1.3.11.13;

SBN 130, my emphasis). Similarly, in describing the "opposition" between a probability and its rival, Hume offers the following:

> ['T]is evident, that as the contrary views are incompatible with each other, and 'tis impossible the object can exist conformable to both of them, their influence becomes *mutually destructive*, and the mind is determin'd to the superior only with that force, which remains after subtracting the inferior. (T 1.3.12.19; SBN 138, my emphasis)

With these descriptions, Hume draws our attention to how live possibilities of contrary types conflict and cancel when we "take knowingly into consideration the contrariety of past events…and carefully weigh the experiments, which we have on each side" (T 1.3.12.7; SBN 134).

Hume is especially clear about this balancing procedure later in the *Treatise* where he offers the following summary:

> When any phænomena are constantly and invariably conjoin'd together, they acquire such a connexion in the imagination, that it passes from one to the other, without any doubt or hesitation. But below this there are many inferior degrees of evidence and probability, nor does one single contrariety of experiment entirely destroy all our reasoning. *The mind ballances the contrary experiments, and deducting the inferior from the superior, proceeds with that degree of assurance or evidence, which remains*. (T 2.3.1.12; SBN 403, my emphasis)

In other words, balancing cancels live possibilities of contrary types and their apportioned assurance to deliver a measurement of the *superiority* of a probability over its rival.

Hume consistently describes the outcome of balancing in these terms. For instance, we're told that balancing delivers "one single idea or image, which is intense and lively in

proportion to the number of experiments from which it is deriv'd, *and their superiority above their antagonist*" (T 1.3.12.21; SBN 140, my emphasis). Similarly, Hume contends that "[e]ach possibility, of which the probability is compos'd, operates separately upon the imagination; and 'tis the larger collection of possibilities, which at last prevails, *and that with a force proportionable to its superiority*" (T 1.3.13.20; SBN 154-55). Again, Hume remarks how "the mind is determin'd to the superior only with that force, which remains after *subtracting* the inferior. (T 1.3.12.19; SBN 138, my emphasis). So balancing cancels contrary possibilities and their apportioned assurance to deliver a measure of a probability's superiority over its rival. Thus, it is not the case that single-event probable judgments are proportioned to the contrary possibilities in a set of contrary evidence.[25]

Where a set of contrary evidence includes a probability and a rival possibility, balancing cancels all of the live possibilities that compose the rival along with an equal number of live possibilities from the probability. Because a probability is made up of a superior number of live possibilities, at least one live possibility of that type survives balancing. The type of live possibility that survives balancing fixes the content of a probable judgment about a single event. For instance, balancing the contrary evidence with respect to aspirin-ingestion delivers the single-event judgment that *aspirin-ingestion will be followed by headache-relief.* Likewise, balancing the contrary evidence with respect to a die with four black sides and two white sides delivers the single-event judgment that *black will turn up*.

Insofar as our assurance for single-event judgments is determined by the make-up of the contrary evidence that we balance, Hume describes them as a "compounded effect":

[25] Which is to say, single-event probable judgments are *not* proportioned to the number of live possibilities that compose a probability.

> As the belief, which we have of any event, encreases or diminishes according to the number of chances or past experiments, 'tis to be consider'd as a compounded effect, of which each part arises from a proportionable number of chances or experiments. (T 1.3.12.16; SBN 136)

Because assurance "encreases or diminishes according to the number of chances or past experiments," our assurance for a probable judgment varies with the number of live possibilities grounding the judgment (T 1.3.12.16; SBN 136). Accordingly, the total assurance apportioned to the live possibilities that survive balancing fixes the degree of assurance for a single-event probable judgment.

For instance, in our aspirin case we have a probability composed of twenty live possibilities and a rival composed of five. So balancing fixes a degree of 3/5 full assurance that *aspirin-ingestion will be followed by headache-relief*.[26] We can say something similar for our die case. Balancing the four live possibilities that black will turn up against the two live possibilities that white will turn up fixes a degree of 1/3 full assurance that *black will turn up*. Thus, balancing a probability against its rival cancels contrary possibilities and their apportioned assurance to fix the content and degree of assurance for a probable judgment about a single event.

By highlighting his three senses of "probability" we've shown that, for Hume, a "probability" is *not* a probable judgment about a single event but a necessary condition for making one. That is, a set of contrary evidence grounds a probable judgment about a single event only where that evidence includes a probability, i.e., a superiority of evidence. Where a set

[26] To fully spell this out, preliminary assurance for my aspirin-ingestion-judgment is divided among twenty-five live possibilities. Balancing cancels all five live possibilities from the rival along with five live possibilities from the probability. This leaves fifteen out of twenty-five live possibilities and their apportioned assurance, which delivers my single-event judgment made with 3/5 full assurance that *aspirin-ingestion will be followed by headache-relief*.

of contrary evidence doesn't include a probability, balancing cancels all live possibilities and their attendant assurance to yield a suspension of judgment. On the other hand, where a set of evidence is uniform such that the live possibilities are all of the same type, there are no contrary possibilities to cancel. In that case, the preliminary assurance from a present impression is preserved through a stage of balancing to yield the full assurance of a causal *proof*. Thus, only when we're faced with a set of contrary evidence are we faced with an occasion for single-event probable reasoning, and only where that evidence includes a probability does balancing deliver a probable judgment about a single event.

IX. Revisiting Interpretive Disagreements

We've seen that Hume identifies a familiar kind of probable reasoning, one that secures long-run estimates of likelihoods and relational judgments, on the way to developing his account of single-event probable reasoning. That Hume is able to capture familiar long-run judgments means we can take seriously his balancing procedure without thereby giving up an approach for securing more familiar probable judgments. But when we fail to distinguish these two approaches to probable reasoning, we're left trying to fit all Hume says about probability—and all we'd like him to say—into a single account.

We often see interpreters describe Humean probable reasoning as a mechanism for assigning "probabilities" to propositions or beliefs. For instance, Jonathan Bennett, Robert Fogelin, and Michael Lynch pursue this line, suggesting that we make a judgment and *assign* it a "probability," i.e., a degree of assurance or confidence.[27] Mikael Karlsson (1990) endorses a similar view when he talks about "giving" assurance or confidence to probable judgments.[28]

[27] See: Bennett (2001) pp.314-15, Fogelin, (1985) pp. 17-19, and Lynch (1996) pp. 91-96.
[28] See pp. 126-27.

While Hume appeals to three different senses of "probability," he never uses the term to refer to a number assigned either as a measurement of likelihood or as a degree of assurance for a probable judgment. What's more, because both the content and degree of assurance for single-event judgments is fixed by balancing contrary evidence, there is no "assigning" or "giving" of assurance to be done.

Part of the problem with these interpretations is that they treat a *type* of probable reasoning Hume identifies but sets aside as Hume's sole concern. This is similar to the mistake we noted from what I called the "influential interpretation," which assumes that assurance for probable judgments is proportional to the contrary possibilities in a set of contrary evidence.[29] To make this assumption is to ignore Hume's balancing procedure. To ignore Hume's balancing procedure is to stop our probable reasoning about a single event at an intermediate stage. Given the contrary nature of the evidence, stopping at this intermediate stage commits us to holding contrary beliefs (T 1.3.12.17; SBN 137).

Until we recognize that Hume introduces a balancing procedure to *resolve* the contrariety in the evidence, we're bound to misunderstand his account of single-event probable reasoning. But once we get hold of this procedure, we can see that the influential interpretation gives us the wrong picture of single-event judgments. Because some degree of the preliminary assurance from a present impression is apportioned to its rival, the preliminary assurance apportioned to a probability is already less than full. What's more, balancing cancels live possibilities of contrary types along with their apportioned assurance. Then strictly speaking, all single-event probable

[29] Recall that something like this is proposed by, for instance, Garrett (1997) and LoLordo (2000). I should note that Garrett and LoLordo mention the conflict between contrary possibilities and talk of a diminishment in assurance. But I confess I'm unsure of how to understand their proposals since, as we saw above, they both claim the outcome is a judgment proportioned to the number of live possibilities of the same type in the total number of live possibilities.

judgments are made with a *diminished* degree of less than full assurance. Accordingly, assurance for a single-event judgment cannot be proportional to the number of live possibilities of the same type in the total number of contrary possibilities prior to balancing. Thus, by relying on a procedure for making long-run estimates to capture single-event judgments, the influential interpretation ignores Hume's balancing procedure and overlooks his novel account of single-event probable reasoning.

Louis Loeb (2002) occupies a kind of middle ground here. He supposes a correspondence between degrees of assurance and likelihoods but recognizes—and tries to incorporate—Hume's balancing procedure. As a first step, Loeb proposes that we understand vivacity, i.e., degrees of assurance, as ranging from zero to one. Given Hume's balancing procedure, and assuming it also underwrites estimates of likelihood, "Hume is committed to identifying a vivacity of zero, after subtraction [or balancing], with a probability of 50 percent" (Loeb, 230).[30] From here, Loeb gives us the following example:

> Consider the case where Cs are observed to be followed by Es half the time and followed by not-Es half the time. Since the two contrary views are equally vivacious, reducing one by the amount of the other leaves a vivacity of zero; zero vivacity must therefore represent a judgment of 50 percent likelihood. (232)

In that case, Loeb seems to have shown that we can engage in the sort of procedure Hume recommends and, via a conversion scale, recover familiar estimates of statistical likelihood.

Loeb acknowledges that there are obvious shortcomings with this approach. Balancing cancels all live possibilities and their apportioned assurance from a rival. So if balanced assurance underwrites estimates of likelihood, Hume cannot give an estimate of likelihood for a

[30] Loeb credits Maher (1981) with this proposal, but it seems to me that Maher is aiming at a different explanation, viz., that from diminishing the initial evidence Hume explains a diminished degree of assurance for a single event.

rival possibility, e.g., that *aspirin-ingestion will not be followed by headache-relief*. While granting that it's "unclear how to represent probabilities lower than 50 percent," Loeb suggests this is not an objection to the proposal but "a symptom of the limitations of the associationist account of belief."[31] However, the "symptom" Loeb identifies actually points to the confusion ushered in by attempting to use a single procedure to express both long-run estimates and single-event judgments. Because these are separate questions, they must be addressed separately.

Determining likelihoods is a matter of determining the proportions of contrary possibilities with respect to a set of contrary evidence. No contrariety emerges from making long-run relational judgments such as *the likelihood of aspirin ingestion relieving my headache is 4/5* and *the likelihood of aspirin ingestion failing to relieve my headache is 1/5*. Because there is no contrariety in judging that "when [these contrary events] do happen, they will be mix'd in the same proportion as in the past," there is no call for balancing or cancelling (T 1.3.12.10; SBN 134). Consequently, a degree of assurance for our long-run judgments is not fixed by resolving the contrariety in the evidence. So while Loeb rightly identifies Hume's balancing procedure, he wrongly supposes it is meant to yield long-run estimates in addition to single-event judgments.

This paves the way for an answer to another of Loeb's objections. In supposing that Hume "runs together estimates of likelihood and degrees of confidence [or assurance]," Loeb supposes estimates of likelihood and degrees of assurance are inextricably linked (229). As a result, Hume seems unable to explain a high degree of assurance for an estimate of low likelihood or a low degree of assurance for an estimate of high likelihood (Loeb, 224-7). But again, this problem arises only when we fail to distinguish between long-run and single-event probable reasoning.

[31] See p. 232 footnote 22.

In making long-run estimates of likelihood, whether they are low or high, certainty is at least possible since we're merely determining the proportions of chances and experiments. In other words, because we have "a precise standard" for determining these proportions, it's a mistake to suppose our long-run judgments are attended with corresponding degrees of assurance (T 1.3.1.5; SBN 72). So when I count up the chances and judge that the likelihood of black turning up is 2/3, it's not the case that I have 2/3 full assurance for this judgment. Putting things rather crudely, when I judge that *4/6 = 2/3*, it's not the case that I have 2/3 full assurance for this judgment.

Because determining likelihoods is merely determining proportions of chances, Hume can readily distinguish between our assurance for estimates of likelihood and the estimates themselves. In the simplest of cases, when I judge that, for instance, the likelihood of a six turning up is 1/6, I have a high degree of assurance for an estimate of low likelihood. In terms of my future expectations, we can say I fully expect that, in the long-run, a 6 will turn up 1/6 of the time.[32]

But where the calculations are fairly complicated or complex, I may well have a low degree of assurance for an estimate of high likelihood. Of course this is entirely familiar from our (often) low degree of assurance for conclusions reached by complicated or complex demonstrative reasoning. Then to repeat what we said above, our assurance for long-run judgments does not follow from the balancing and cancelling of contrary possibilities but, instead, depends upon the complexity of the question we're asking and the evidence we're considering. Thus, to suppose that Hume's balancing procedure is meant to deliver both long-

[32] We made this point earlier by saying that, while we can't be certain about a merely probable event, we may well be certain about the likelihood of a merely probable event. When we're asking about likelihoods, we're simply asking for an accounting of the evidence. And on this point, Hume grants at least the possibility of being certain of our judgments (T 1.3.11.8; SBN 127).

run estimates and single-event judgments is another way of running together two questions that Hume is careful to separate.

Barry Gower (1990, 1991) tips the interpretive scale to the other side by taking seriously Hume's balancing procedure while avoiding inconsistency.[33] However, this comes at the cost of supposing an account of single-event judgments exhausts what Hume can offer regarding the merely probable. Accordingly, Gower (1991) warns that Hume's balancing procedure will seem "odd" to contemporary readers:

> There is, though, one feature of Hume's treatment which inevitably strikes a modern reader as odd. For, he says, in order to estimate the probability of a chance event we should reduce the number of chances which favour it by the number of chances which disfavour it. (6)[34]

Rather than setting aside what strikes us as strange at first sight, Gower recommends taking Hume's procedure seriously. What's more, he notes how a legalistic model, supported by a parallel in Jakob Bernoulli's work, actually lends support to Hume's procedure.

For instance, if we think of contrary live possibilities as competing testimony for contrary event-types, a procedure for balancing and cancelling allows for measuring the superiority of one type of testimony over testimony of a contrary type. Similar to what we set out above, Gower (1991) notes that we arrive at a single-event judgment from contrary testimony only where the evidence includes a probability in Hume's second sense:

> [Suppose our] evidence is that m out of $m + n$ previous occurrences of C have produced E, and that n out of $m + n$ have not produced E. Only if $m > n$ will the belief in question have

[33] Maher (1981) and Vanderburgh (2005) also pursue something closer to this line than what we've considered above.

[34] As we said regarding other interpretive strategies, describing single-event reasoning as an attempt to "estimate the probability" of an event obscures Hume's point and employs a sense of "probability" that Hume doesn't use. However, I take it that by now we've said quite enough on this point, so I merely make note of it here and proceed with an examination of Gower's proposal in the text.

> a probability at all, and for all Hume says we could take the absolute value, *m* - *n* as a measure of this probability. (15)

As Gower expresses it, Hume's balancing procedure requires taking "the difference between, and not the ratio of" contrary possibilities to reach a judgment about a single event (15).[35] So long as the evidence includes a probability, balancing yields "a positive number which shows that we are right to give some force [or present assurance] to the probable argument" (Gower 1991, 12). Put differently, any evidence that survives balancing grounds a degree of assurance for an event of that type, i.e., a single-event judgment.

Gower is right that a degree of assurance for single-event judgments is fixed by cancelling some of the initial evidence, viz., the live possibilities of contrary types.[36] Further, he's right to take seriously Hume's balancing procedure. But in doing so, Gower (1991) overlooks Hume's identification of a procedure for making long-run judgments, noting that "Hume's system for measuring probability is…quite unlike modern methods" (15). This remark would be right if the procedure for single-event judgments exhausted what Hume offers regarding the merely probable. However, it would also commit Hume to a terribly impoverished account of probable reasoning that failed to capture our most familiar estimates of likelihood, our degrees of assurance for those estimates, and our relational judgments about events that are more, less, or equally likely compared to others. We're committed to this impoverished view of

[35] See also Gower (1990).

[36] William Vanderburgh (2005) defends a variant of this alternative interpretation and, as I do, agrees with much that Gower offers. However, Vanderburgh takes it that Gower missteps in appealing to numerical or quantifiable probabilities (55). Alternatively, Vanderburgh suggests that a "non-numerical theory" better captures Hume's point: "There are other ways to achieve this: In discussions of temperature, for example, classificatory concepts (hot, warm, very cold, etc.) and comparative concepts (hotter than, etc.) are possible without any numerical scale. Similarly the non-numerical tradition of evidential probability has given us perfectly serviceable classificatory concepts (improbable, probable, highly probable) and comparative concepts (more probable than, etc.)" (54). However, this suggests Vanderburgh also runs together Hume's two types of probable reasoning.

Hume's approach to probable reasoning only if we think it excludes long-run reasoning in the way Gower supposes. Hopefully I've convinced you that this is not the case.

While Gower rightly identifies the *procedure* for making single-event judgments, he wrongly supposes this is all Hume can say about probable reasoning in general.[37] To get Hume right, we need to distinguish a procedure for making long-run judgments by determining proportions of contrary possibilities from a procedure for making single-event judgments by balancing contrary possibilities. Making this distinction—and recognizing that it is Hume's distinction—shows that taking the latter procedure seriously doesn't require sacrificing a more familiar approach to probable evidence. At the same time, it shows how we misunderstand Hume when we suppose that it is this more familiar approach to probable evidence that he is trying to capture.

X. Conclusion

Part of the difficulty in recognizing Hume's two procedures for probable reasoning is that he employs three senses of "probability" in developing them. Making matters worse, none of these three senses track our most common use of the term, where a "probability" is a number assigned to a proposition or belief as a measure of likelihood or degree of confidence. In spite of this, we've shown that Hume acknowledges one type of probable reasoning for making long-run estimates of likelihood and another for making judgments about single events (T 1.3.12.11; SBN 134-35). This latter type of single-event probable reasoning is Hume's central concern, and

[37] Still, I get the impression Gower (1991) had an idea that Hume made this distinction from the following: "There can be little doubt that Hume was aware that chances could be calculated though we must, I think, assume that he lacked detailed knowledge of how this was to be done in any cases other than the simplest" (4). From here it is a short step to the conclusion that Hume recognized the possibility of calculating chances *and* that it failed to capture what he was anxious to explain.

represents what he takes to be his novel contribution to our thinking about *probability*. From our examination of Hume's three sense of "probability" we've clarified the conditions and procedure Hume outlines for making these single-event probable judgments. That is, we've shown that only where a set of contrary evidence (i.e., "probability" as a source of uncertainty) includes a majority of live possibilities of the same type (i.e., "probability" as a superiority of evidence) does balancing contrary possibilities resolve the contrariety in the evidence to deliver a probable judgment about a single event (i.e., "probability" as reasoning from conjecture).

Because single-event judgments and long-run conclusions are reached by different types of probable reasoning, acknowledging one doesn't require giving up the other. What's more, simply pointing out that these approaches differ or that they don't share all of the same features is no objection to either of them. We may well argue over whether they are plausible accounts of probable reasoning and whether Hume is right to be proud of his single-event procedure. But part of my aim in this chapter has been to show that, before these arguments can begin in earnest, we must first get clear on what we're arguing over.

That said, the central aim of this chapter has been to take the first step toward a new interpretation of Hume's "Of scepticism with regard to reason." In staging the skeptical challenge to reason, Hume argues that any first step of reasoning must be continued with a second that functions to "correct and regulate" a first judgment (T 1.4.1.5; SBN 181-82). In a second step, we're supposed to weigh the evidence afforded by recollected judgments from reason. Because we've all made errors in reasoning, this evidence must include recollected errors. So in a second, corrective step, we're weighing *contrary experiments*, which means we're engaged in a kind of probable reasoning. Consequently, to understand how the skeptical arguments are supposed to reach their conclusions, we must first understand Hume's approach to

probable reasoning. With the framework developed in the this chapter, we've taken a necessary first step toward unpacking Hume's skeptical arguments against reason.

In the next chapter, we take the next step by turning to a largely unexamined interpretative issue. With the skeptical arguments against reason, we're told to weigh a set of evidence that includes recollected errors in reasoning. Then to understand how a second step of reasoning is supposed to go, we need to know what we're being asked to recall when Hume prompts us to reflect on "all the instances, wherein our understanding has deceiv'd us" (T 1.4.1.1; SBN 179). More precisely, we need to know what an *error in reasoning* is for Hume.

While a lot of attention has been paid to "Of scepticism with regard to reason," surprisingly little attention has been devoted to this central question about errors in reasoning. In the next chapter I develop a comprehensive account of Humean errors in reasoning. I argue that, in general, errors in reasoning are of two types, viz., *evidence selection errors* and *rule-application errors*. Errors in reasoning are brought on by our activities as reasoners and, thus, they are avoidable and correctable in retrospect. Noticing this helps to differentiate them from other mistaken judgments that might be described as errors of a kind, such as those caused by perceptual illusions. These latter sorts of errors are what I'll call "natural errors" in that they are unavoidable and attributable to human nature. Because natural errors are not instances "wherein our *understanding* has deceiv'd us," they are not the sorts of errors that are relevant for Hume's skeptical arguments against reason (T 1.4.1.1; SBN 179, my emphasis).

Chapter 2

Errors in Reasoning and Accidents of Nature

I. Introduction

Hume's skeptical arguments against reason are sparked by the seemingly benign claim that all of us have made and are able to recall errors in reasoning. Our recollected errors give us some reason to worry that any present reasoning is similarly flawed and that any present judgment is similarly mistaken. Given this explicit appeal to recollected errors in reasoning, understanding Hume's skeptical arguments requires understanding what we're being asked to recall. However, surprisingly little attention has been paid to working out what an error in reasoning is for Hume. The aim of this chapter is to develop a comprehensive account of errors in reasoning that shows what they are, how they're made, and how they're detected so as to be recalled and pressed into service for Hume's "Of scepticism with regard to reason."

Broadly speaking, we've made an error in reasoning whenever we should have reasoned differently. With respect to any present judgment, there are roughly two ways we might have reasoned differently. First, we could have selected and reasoned on the basis of different evidence. Second, we could have reasoned in a different way with respect to the evidence we actually considered, e.g., by applying demonstrative rules differently. Then to say that we've made an error in reasoning is to say that we should have reasoned either from different evidence or in a different way. So in general, errors in reasoning are of two types, viz., what I'll call *evidence selection errors* and *rule-application errors*.

In demonstrative reasoning, we're susceptible to both types of error. That is, we sometimes select the wrong demonstrative evidence and sometimes misapply demonstrative

rules with respect to the selected evidence. But with probable reasoning, the "rules" are applied for us insofar as the apportioning of preliminary assurance and the balancing of contrary evidence are mechanistic and not under our direct control. Consequently, for probable reasoning in particular, and matter of fact reasoning in general, all errors in reasoning are evidence selection errors.

This last claim puts my account of errors in reasoning at odds with something proposed by Don Garrett (2006). Garrett argues that errors in probable reasoning cause us to make probable judgments with the wrong degree of assurance. This might follow from either the improper apportioning of preliminary assurance or the inaccurate balancing and cancelling of contrary evidence. Accordingly, the probable error Garrett proposes is best described as a rule-application error.

Something like this appears to be suggested by Hume's discussion of unphilosophical probabilities, i.e., unphilosophical sources of uncertainty. Hume describes four unphilosophical sources of uncertainty: (i) fading memory, (ii) particularly striking experiments, (iii) especially complicated arguments, and (iv) unreflective generalizations. In the last chapter, we said the mark of an unphilosophical source of uncertainty is that it yields uncertain judgments that are not proportioned to the relevant evidence. As Hume describes them, judgments associated with these four unphilosophical probabilities are made in *error* and, at least sometimes, with what looks like the wrong degree of assurance (T 1.3.13.7; SBN 146-7).[1]

This seems to lend support for something along the lines of Garrett's proposal. But we'll see that it's a mistake to cast judgments from unphilosophical probabilities as the products of

[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number.

errors in reasoning. In what follows we'll consider several examples that show how errors in reasoning are *avoidable* because they are introduced by our activities as reasoners, e.g., our selection and handling of evidence. This is why their detection is attended by the realization that we should have reasoned differently. In contrast, uncertain judgments from unphilosophical probabilities are the unavoidable result of either human limitations or the influence of custom and habit. Like familiar perceptual illusions that we cannot help but see, the influence of unphilosophical probabilities is unavoidable. So judgments from unphilosophical probabilities are best understood as the products of *natural errors* rather than errors in *reasoning* where "our *understanding* has deceiv'd us" (T 1.4.1.1; SBN 180, my emphasis). Because they are accidents of nature rather errors of reason, natural errors are not relevant for running Hume's skeptical arguments against reason.

The error Garrett describes bears relevant similarities to Hume's description of unphilosophical probabilities. So if judgments might be made with the wrong degree of assurance in the way Garrett suggests, they belong under the heading of "natural error" rather than that of "error in reasoning." As a first step in developing a comprehensive account of errors in reasoning that serves to distinguish them from natural errors, the next section begins with a general sketch of good reasoning on the one hand and bad reasoning on the other.

II. Good and Bad Reasoning Generally

Hume unleashes two infamous arguments against reason that threaten, first, the degeneration of all knowledge into probability and, second, the extinction of all belief (T 1.4.1.1; SBN 180). The first argument, which I'll call the Degeneration Argument, takes aim at demonstrative reasoning by calling into question any judgment taken to be demonstratively

certain. The second argument, which I'll call the Extinction Argument, targets probable reasoning by casting doubt on any (single-event) judgment taken to be probable.[2] While they have different targets, both arguments are fueled by our ability to recall errors in reasoning. Recollected errors give us some reason to worry that any similar judgment might be mistaken in similar ways and for similar reasons. Accordingly, recollected errors give us some reason to doubt any judgment reached by reasoning. But despite their central role in Hume's skeptical arguments, we have yet to see a compelling case for how we ought to understand errors in reasoning.

It seems clear enough that when we reason, part of our aim is to get things right. In asking us to recall those times where our efforts fell short, interpreters have supposed that Hume is casting doubt on the reliability of our reasoning by spotlighting our fallibility. Michael Lynch (1996) notes that the skeptical arguments are driven by an "awareness of our fallibility" (91). William Morris (1989) says the point of the arguments is to force any reasoner to engage in an "assessment of himself as a fallible intellect" (47). Striking a similar tone, Kevin Meeker (2000) suggests that Hume is calling for the "careful consideration of our fallibility" (224). Framing different sides of the same concern, Robert Fogelin (1985) sees the arguments as demanding an "assessment of the reliability of our faculties," while Don Garrett (1997) thinks they call for "reflecting on the fallibility of our faculties" (16, 228). David Owen (1999) echoes this sentiment when says the arguments are driven by the claim that "our fallible faculties require a check to ensure they are working properly" (180).

While fallibility has some role to play in Hume's arguments, it is merely the starting-point. The fallibility of our faculties is confirmed by past experience—reflecting on the fact that

[2] As I note below, while judgments from probable reasoning are the specific target of the Extinction Argument, judgments from causal reasoning are implicated as well.

we've made errors in reasoning *proves* that we're fallible. But Hume's skeptical arguments don't work by having us question reasoning in general or its reliability. Instead, we're asked to evaluate any instance of reasoning against the evidence of past experience. In particular, recollected errors are relevant evidence of the live possibility that any present reasoning is similarly flawed such that any present judgment is similarly mistaken. To drive the skeptical arguments against reason, Hume calls on us to marshal this evidence from past experience:

> We must, therefore, in every reasoning form a new judgment, as a check or controul on our first judgment or belief; and must enlarge our view to comprehend a kind of history of all the instances, wherein our understanding deceiv'd us, compar'd with those, wherein its testimony was just and true. (T 1.4.1.1; SBN 180)

While it's true that past errors prove our fallibility, Hume's skeptical arguments call for the recollection of particular errors in reasoning as part of a "check or controul" on any judgment reached by present reasoning. Thus, making the skeptical arguments precise requires identifying precisely what we're being asked to recall.

In general, whether our reasoning is good or bad depends on two elements, viz., the evidence we select and how we handle that evidence. In particular, we reach the right judgment from good reasoning only if our reasoning is what I'll call "legitimate":

> Reasoning is legitimate only if (i) all and only the relevant evidence is selected, and (ii) rules of reasoning are properly applied such that the selected evidence is appropriately weighed

More simply, our reasoning is legitimate only if we reason from the right evidence and in the right way.

What constitutes the "right" or "relevant" evidence is determined by our present aims and present circumstances. In general, to say that evidence is presently relevant is to say that it *should* be considered given our present aims and circumstances. Our "present aims" are simply our reason for reasoning. For instance, when balancing checkbooks or forming expectations about the weather we're reasoning to figure out how much money we have or whether we should carry an umbrella. In light of these particular aims, particular sets of evidence will be relevant for achieving them with respect to our present circumstances.

Our "present circumstances" are the actual conditions under which we're reasoning. If it's true that evidence should be considered, it must be true that it's accessible with respect to our actual circumstances. For example, evidence about the effects of global warming was inaccessible when we first decided to burn fossil fuels. Because this evidence was inaccessible, our ancestors didn't make an error in reasoning by failing to consider it. Where evidence is inaccessible it *can't* be used in our reasoning, so it's not the case that it *should* be used in our reasoning. Hence, to reason *from the right evidence* is to select all and only the relevant evidence in light of our present aims and actual circumstances.

Whether the selected evidence is "appropriately weighed" depends upon the type of reasoning required to achieve our present aims with respect to our present circumstances. Broadly speaking, the selected evidence is appropriately weighed when the rules of reasoning are properly applied. In demonstrative reasoning that means properly applying demonstrative rules while in matter of fact reasoning it means accurately balancing the selected evidence. So in general, to reason *in the right way* is to handle the selected evidence in accordance with the appropriate rules of reasoning. When we reason in the right way and from the right evidence, our reasoning is legitimate and we reach the right judgment.

Of course the other side of this is that we sometimes make the wrong judgment because of an error in reasoning. We reach the wrong judgment from bad reasoning only if our reasoning is what I'll call "illegitimate":

> Reasoning is illegitimate when (i) the selected evidence excludes relevant evidence, or (ii) the selected evidence includes irrelevant evidence, or (iii) rules of reasoning are misapplied such that the selected evidence is inappropriately weighed[3]

More simply, we make an error and our reasoning is illegitimate when we reason from the wrong evidence or in the wrong way. We reason from the wrong evidence when we fail to select the evidence best suited to our present aims given our actual circumstances, e.g., by excluding evidence about global warming when reasoning about current energy policies. We reason in the wrong way by failing to reason in accordance with the appropriate rules of reasoning, e.g., by miscalculating our bank balances. When either of these occur we err and reach the wrong judgment from illegitimate reasoning.

While the terminology I've employed is novel, I worry the proposal will seem all too familiar. It's tempting to suppose that legitimate reasoning delivers true judgments while illegitimate reasoning delivers false ones. Though the marks of good and bad reasoning are often taken to be truth and falsity, I've intentionally made no mention of them. Instead, I've been careful to say only that legitimate reasoning delivers the "right" judgment and that illegitimate reasoning delivers the "wrong" judgment. As we'll see through several examples, it's possible to arrive at true judgments from illegitimate reasoning and false judgments from legitimate reasoning. So truth and falsity are not necessarily the marks of good reasoning on the one hand and bad reasoning on the other.

[3] Put differently, reasoning is illegitimate when the evidence explicitly considered (i) does not include all and only the relevant evidence, or (iii) is inappropriately weighed.

This is why I've framed legitimacy as a matter of our selection and handling of evidence in light of present aims and circumstances. On this picture, distinguishing good reasoning from bad reasoning means asking whether we could have reasoned better. When the answer is "yes," we've made some error because we ought to have reasoned differently. Accordingly, when we reason from the wrong evidence or in the wrong way, we reach the wrong judgment *even if that judgment turns out to be true*. On the other hand, when we couldn't have reasoned better, it's not the case that we *should* have reasoned differently. Consequently, just in case we reason from the right evidence and in the right way, we reach the right judgment *even if that judgment turns out to be false.* In arguing for these initially controversial points, we'll begin with a focused examination of demonstrative reasoning before turning our attention to matter of fact reasoning. What emerges is a comprehensive account of the errors in reasoning that fuel Hume's skeptical arguments against reason.

III. Demonstrative Reasoning and Two Types of Error

In the last chapter we saw that demonstrative reasoning offers the possibility of securing knowledge which, for Hume, is certainty that "arises from the comparison of ideas, and from the discovery of such relations as are unalterable, so long as the ideas continue the same" (T 1.3.3.2; SBN 79). Certainty is possible because the objects of knowledge are ideas that stand in one of four constant relations, viz., resemblance, contrariety, degrees in quality, and proportions in quantity or number (T 1.3.1.2; SBN 70).[4] At least in the simplest of cases, all four constant relations can be judged intuitively or "at first sight, without any enquiry or reasoning" (T 1.3.1.2,

[4] Recall that constant relations are those relations that remain unchanged just in case the ideas compared remain the same. (T 1.3.1.2; SBN 70).

1.3.1.3; SBN 70).[5] That leaves proportions in quantity or number that can't be "comprehended in an instant" as the sole target of demonstrations (T 1.3.1.3, 1.3.1.5; SBN 70, 71). Accordingly, Hume confines the demonstrative sciences to algebra and arithmetic so that, strictly speaking, all demonstrative judgments are mathematical judgments (T 1.3.1.5; SBN 71).

Where we "settle the proportions" with demonstrative reasoning, Hume says we "proceed in a more *artificial* manner" (T 1.3.1.3; SBN 70, Hume's emphasis). It would be great to give a precise account of exactly what is "artificial" about the "manner" of demonstration. Unfortunately, Hume provides frustratingly little detail of how he understands the process of demonstrative reasoning. In what is offered he talks of applying "rules" while invoking commonplace examples of mathematicians and accountants going about their work (T 1.4.1.1-3; SBN 180-1). These clues suggest that Hume is concerned to capture the ways in which we actually perform calculations.[6] To that end, the methods of calculation and rule-application we're taught in arithmetic and algebra courses suffices.

On this reading, one sense in which the *manner* of demonstrations is *artificial* is that they must be set-up and worked through either on paper or in our heads. Hume marks this feature of demonstrations with an example of an accountant whose reasoning is aided by "the artificial structure of the accompts" (T 1.4.1.3; SBN 181). An artificial structure allows us to display a

[5] Hume is especially clear on this for the first three relations, saying that they "are discoverable at first sight, and fall more properly under the province of intuition than demonstration" (T 1.3.1.2; SBN 70).

[6] Interpreters like David Owen and Don Garrett have claimed that Humean demonstrations are best understood as chains of intuitions. See: David Owen, *Hume's Reason* (New York: Oxford University Press, 1999), 100-101, and Don Garrett, *Cognition and Commitment in Hume's Philosophy*, (New York: Oxford University Press, 1997), 223. For my part, I see no compelling textual evidence in favor of this reading. As I suggest above, the scant descriptions Hume provides seem to count against it. Though I can't fully argue the point here, a compelling point against the chains-of-intuitions reading is its practical implausibility. It would take an accountant ages to work through even a relatively simple addition, e.g., 893 + 3,475, by constructing a chain of intuitive links along the lines suggested by Owen. What's more, this procedure would be entirely unfamiliar to an accountant and fails to reflect how a person would actually carry out the work. All of this counts against reading Humean demonstration in the way Owen and Garrett suggest. At any rate, it is perhaps enough for the purposes of this paper to note that the question of how we ought to understand Humean demonstrations is at least an open one.

process of reasoning to ourselves and others while tracking applications of "infallible" demonstrative rules (T 1.4.1.1; SBN 180). For instance, by requiring us to display our reasoning with an artificial structure (usually with the command to "Show your work!") our instructors were able to evaluate our facility and accuracy in applying demonstrative rules. Then more precisely, with demonstrations we employ material or mental aids to reasoning (i.e., artificial structures on paper or in our heads) for judging proportions in quantity or number that can't be judged intuitively. Thus, rather than following directly and "immediately" from a comparison of ideas, demonstrative judgments are reached in an indirect or *artificial manner* "by the interposition of other ideas" (T 1.3.7.3; SBN 95).[7]

One thing Hume is unmistakably clear on is the possibility of securing *certainty* from demonstrative reasoning. In particular, judgments made in conformity with a "precise standard" of equality are demonstratively certain:

> [A]lgebra and arithmetic [are] the only sciences, in which we can carry on a chain of reasoning to any degree of intricacy, and yet preserve a perfect exactness and certainty. We are possest of a *precise standard*, by which we can judge of the equality and proportion of numbers; *and according as they correspond or not to that standard, we determine their relations, without any possibility of error*. When two numbers are so combin'd, as that the one has always an unite answering to every unite of the other, we pronounce them equal. (T 1.3.1.5; SBN 71, my emphasis)

[7] As I make clear in chapter four, there are other elements that contribute to the "artificial manner" of demonstrative reasoning. In particular, with intuitive judging, the target ideas are compared directly. But due to the complex nature of the questions addressed by demonstrative reasoning, the target ideas can only be compared *indirectly* by way of intermediary ideas. This indirect or "artificial manner" of demonstration is analogous to the "oblique manner" characteristic of probable reasoning where judgments are the *indirect* rather than the immediate result of custom (T 1.3.12.7; SBN 133).

Accordingly, we reach the right demonstrative judgment only if it is made in conformity with the precise standard of equality that grounds demonstrative certainty. But whether we reach the right judgment depends on whether our demonstrative reasoning is legitimate.

We've said that reasoning is legitimate only if (i) all and only the relevant evidence is selected and (ii) the selected evidence is appropriately weighed. Given that demonstrative reasoning targets proportions in quantity or number, "demonstrative evidence" is broadly construed to include things like characters, numbers, symbols, and data as well as objects conveying them such as account-balances and receipts. We reason *from the right demonstrative evidence* when we select all and only the relevant evidence given our present aims and circumstances. We reason *in the right way* when demonstrative rules are properly applied with respect to the selected evidence. When we reason from the right demonstrative evidence and in the right way, we reach the right judgment from legitimate demonstrative reasoning.

To illustrate, suppose that on the basis of my accounting work for a struggling company I make the judgment that *the company is $30,000 in debt*. My aim was to arrive at the right judgment about the company's financial state. Because I was unable to determine the company's financial state simply by looking over the receipts, making this judgment required demonstrative reasoning. To arrive at the right judgment, I needed to select all and only the relevant financial data and properly apply demonstrative rules with respect to that data. If I've managed that, then I've reasoned from the right evidence and in the right way. In that case, from legitimate demonstrative reasoning I've rightly judged that *the company is $30,000 in debt*.

But as we've all learned (repeatedly), we sometimes reach the wrong judgment from illegitimate demonstrative reasoning. In general, reasoning is illegitimate only if we should have reasoned differently, viz., from a different set of evidence or in a different way. In particular,

demonstrative reasoning is illegitimate when (i) relevant evidence is excluded, or (ii) irrelevant evidence is included, or (iii) demonstrative rules are improperly applied with respect to the selected evidence. It follows that there are two *types* of demonstrative error, viz., what I'll call an *evidence selection error* and a *rule-application error*. Since the latter type of error is likely the most familiar, we'll start there.

Rules are only as good as the reasoners applying them. Hume reminds us of this with the opening line of the Degeneration Argument by contrasting the certainty of demonstrative rules with our uncertain applications of them:

> In all demonstrative sciences the rules are certain and infallible; but when we apply them, our fallible and uncertain faculties are very apt to depart from them, and fall into error. (T 1.4.1.1; SBN 180)

Suppose that in my financial reasoning I selected all and only the relevant financial data but misapplied some rule, e.g., by failing to carry a 1, or by adding when I should have subtracted, or by entering the same receipt twice. In that case, I've reasoned from the right evidence but in the wrong way. When a colleague assigned to check my work brings the error to my attention, I discover that I've wrongly judged that *the company is $30,000 in debt*. In general, when we make a rule-application error we reach the wrong judgment from illegitimate demonstrative reasoning.

When we misapply demonstrative rules and reach the wrong judgment, falsity is the *usual* effect though it isn't the necessary one. I might make a rule-application error in one step but reach a true judgment because of a second, fortuitous rule application-error in another step. However, where we stumble onto a true conclusion in this way, "a perfect exactness and certainty" is not *preserved* by our reasoning (T 1.3.1.5; SBN 71). In such cases, we've made an

error insofar as we *should* have reasoned differently. And if we should have reasoned differently, then we've reached the wrong judgment. This is why our instructors marked our answers "wrong" whenever we reached *true* conclusions for the wrong reasons. Thus, irrespective of the truth or falsity of our judgments, when we make a rule-application error we reach the wrong judgment from illegitimate demonstrative reasoning.

While evidence selection errors may not be immediately familiar, once they're explained I suspect they will be recognized as common demonstrative errors. There are two ways to make an evidence selection error, viz., by failing to consider *all* of the relevant evidence or by failing to consider *only* the relevant evidence. For example, when I exclude a receipt from the present business quarter, I make an evidence selection error by failing to consider all of the relevant evidence. Alternatively, when I include a receipt from the previous quarter, I make an evidence selection error by failing to consider only the relevant evidence. In both cases, I reach the wrong judgment by reasoning illegitimately from the wrong evidence. To get a better feel for evidence selection errors I'll offer two additional cases, one fictitious and one real, aimed at illustrating different ways we might make and detect these errors.

The first case is, as far as I can tell anyway, a well-worn myth offered as a cautionary tale to architecture students. According to the story, an aspiring architect was tasked with building a library. Unfortunately, in calculating the load-bearing requirements of the structure this hapless builder failed to account for the weight of the books. Because of this oversight, relevant evidence regarding the total weight the structure needed to support was excluded. By reasoning from the wrong evidence, our unfortunate architect reached the wrong judgment from illegitimate demonstrative reasoning—a mistake that was discovered when the completed library failed to support the actual load and began to sink.

The second case, and to my mind one of the more striking cases of an evidence selection error, comes from NASA's *attempt* to put a craft in orbit around Mars in 1999. I emphasize "attempt" because the craft burned up in Mars' atmosphere due to the fact that "one team used English units…while the other used metric units for a key spacecraft operation."[8] By failing to use the same units, they failed to include *all* of the relevant evidence given their aims. As a result, the teams reached the wrong judgments from illegitimate demonstrative reasoning—a fact they discovered when the craft was lost.

As in the case of rule-application errors, evidence selection errors entail that we reach the wrong judgment rather than a false judgment. After all, even if I've selected the wrong financial data, so long as I reason in the right way by properly applying demonstrative rules, my calculations will turn out to be true. The same can be said for the architect and the NASA teams—just in case demonstrative rules were properly applied with respect to the selected evidence, they reasoned in the right way and made true judgments. Nevertheless, all of us made evidence selection errors and, as a result, we all failed to achieve our present aims. The failure to achieve our present aims revealed that we reached the wrong judgments from illegitimate demonstrative reasoning even if our calculations turned out to be true.

Since it's possible to reach true judgments in spite of our errors, truth is not necessarily the mark of demonstrative success. What we can say is that *legitimate* demonstrations secure demonstrative certainty because they "preserve a perfect exactness and certainty" to ensure that judgments are made in conformity with a precise standard of equality (T 1.4.1.1, 1.1.3.5; SBN 180, 71). It follows that any false conclusions reached by demonstrative reasoning must be the product of error. However, demonstrative errors don't entail that we reach a false judgment. So

[8] See: "Mars Climate Orbiter Team Finds Likely Cause of Loss" (Sept. 1999) available at the Mars Climate Orbiter website: http://mars.jpl.nasa.gov/msp98/news/mco990930.html.

we can't rely on falsity for the identification of demonstrative errors. Instead, *illegitimate* demonstrative reasoning, which fails to "preserve a perfect exactness and certainty" and delivers true judgments only accidentally, is the mark of demonstrative error (T 1.1.3.5; SBN 71). Thus, distinguishing good demonstrative reasoning from bad demonstrative reasoning requires an appeal to legitimacy and illegitimacy rather than truth and falsity.

In the course of identifying legitimacy and illegitimacy as the marks of good and bad demonstrative reasoning respectively, we've exposed two types of demonstrative error while gesturing at several ways they might be detected. A common route to detection is when our demonstrative errors are pointed out by others. When my colleague goes over my financial calculations and spots a rule-application error or an evidence selection (or both), I discover that I've reached the wrong judgment. Likewise, when learning to apply demonstrative rules, our instructors called attention to instances where we reasoned in the wrong way or from the wrong evidence. In fact, one of the lessons we're taught is to check our own work in the hopes of detecting our demonstrative errors before they're discovered by others.[9]

But in everyday life, what I take to be the most common way of detecting demonstrative errors is when we fail to achieve our present aims because of them. Things like the burned-up orbiter and sinking library cause us to worry that something has gone wrong in our reasoning and that we've reached the wrong judgment. By returning to the artificial structures that aid in our demonstrative reasonings, we're able to identify the type of error we've made. In this way, the

[9] This process has a tendency to produce a habit where we learn to distrust ourselves when attempting to apply a particular rule or when we're doing so under particularly stressful circumstances. I take it this learned hesitancy from awareness of past errors is what Hume has in mind when he remarks that "no algebraist nor mathematician [is] so expert in his science, as to place entire confidence in any truth immediately upon his discovery of it" (T 1.4.1.2; SBN 180-1).

discovery that we've reached the wrong demonstrative judgment reveals not only that we've made an error but (eventually) what we should have done differently to avoid the error.

Part of identifying what we should have done differently involves isolating the *cause* of our error. Hume gives a broad explanation of how we fall into error by appealing to "the irruption of other causes, and the inconstancy of our mental powers" (T 1.4.1.1; SBN 180). When we reflect on demonstrative errors such as those outlined above, we find several candidates that answer Hume's appeal to "other causes." For instance, distraction, fatigue, forgetfulness, complexity, misremembering, misperception, confusion, miscommunication or some combination of these are familiar causes of our demonstrative errors.

With this last piece in place we've identified what demonstrative errors are, how they're made, and how they're detected so as to be recalled and pressed into service for the purposes of the Degeneration Argument. Thus, when Hume prompts us to reflect on our demonstrative errors, he is asking us to recall instances where (a) causes such as distraction or confusion led to (b) an evidence selection error or (c) a rule-application error such that (d) we reached the wrong judgment from illegitimate demonstrative reasoning, which (e) we discovered with the help of others or when we failed to achieve our present aims. With a complete account of demonstrative errors in hand, we'll now turn our attention to matter of fact reasoning.

IV. Matter of Fact Reasoning and a Single Type of Error

While judgments from probable reasoning are the specific target of the Extinction Argument, judgments from causal reasoning are implicated as well. In what follows I'll refer to these collectively as judgments reached by "matter of fact reasoning." Where precision is needed to mark points of contrast I'll explicitly distinguish causal reasoning from probable

reasoning. As a reminder, when I talk of *probable reasoning*, I mean the kind of indirect, single-event probable reasoning that is Hume's focus. With these preliminary points in mind, we'll begin by briefly revisiting how matter of fact reasoning works in a Humean framework.

Hume tells us that "all reasonings concerning *matter of fact* are founded on the relation of cause and effect" (A 8; SBN 649, Hume's emphasis). Whereas demonstrations target relations of ideas, "all reasonings from causes or effects terminate in conclusions…concerning the existence of objects or of their qualities" (T 1.3.7.2; SBN 94-5).[10] In making judgments about related objects we rely on experienced causal relations, and the "foundation" of our reasoning is an impression of sensation or memory:

> [T]he *belief* or *assent*, which always attends the memory and senses, is nothing but the vivacity of those perceptions they present…'Tis merely the force and liveliness of the perception, which constitutes the first act of the judgment, and lays the foundation of that reasoning, which we build upon it, when we trace the relation of cause and effect. (T 1.3.5.7; SBN 86)

Hume emphasizes the role of a present impression in contrasting probable reasoning with demonstrations that target relations of ideas "consder'd as such":

> PROBABILITY, as it discovers not the relations of ideas, consider'd as such, but only those of objects, must in some respects be founded on the impressions of our memory and senses, and in some respects on our ideas…'Tis therefore necessary, that in all probable reasonings there be something present to the mind, either seen or remember'd; and that from this we infer something connected with it, which is not seen nor remember'd. (T 1.3.6.6; SBN 89)

[10] Recall Hume's distinction between constant and inconstant relations discussed in the last chapter (T 1.3.1.2, 1.3.2.1; SBN 70, 73).

An impression that is "present to the mind" supplies the assurance for our inferences about "something connected with it." So without a present impression, matter of fact arguments would leave us with no belief or assurance (T 1.3.4.2; SBN 83).[11] Thus, an impression of sensation or memory that supplies *preliminary* assurance for reasoning about related objects is the *necessary* "foundation" of matter of fact reasoning.

Because experience is the only way for us to discover causal relations, past experience is the only source of evidence for matter of fact reasoning:

> 'Tis therefore by *EXPERIENCE* only, that we can infer the existence of one object from that of another…In all those instances, from which we learn the conjunction of particular causes and effects, both the causes and effects have been perceiv'd by the senses, and are remember'd; But in all cases, wherein we reason concerning them, there is only one perceiv'd or remember'd, and the other is supply'd in conformity to our past experience (T 1.3.6.2; SBN 87)

Hume echoes this point in explaining how we arrive at probable judgments about single events on the basis of contrary experiments:

> [A]s past experience regulates our judgments concerning the possibility of these effects, so it does that concerning their probability; and that effect, which has been the most common, we always esteem the most likely. (T 1.3.12.8; SBN 134)

It follows that past experience supplies the evidence as well as the *standard* for matter of fact judgments insofar as we reach the right judgment only if it is made in conformity with past experience that is presently relevant.

[11] In the last chapter we noted that Hume makes just this point regarding hypothetical arguments that leave us with "no belief nor evidence" because they include "neither any present impression, nor belief of a real existence" (T 1.3.4.2; SBN 83).

For a particular case of matter of fact reasoning the selected evidence is a subset of experienced events, i.e., *confirmed possibilities*, which we recognize as *live possibilities* with respect to a present impression of sensation or memory. Once a set of evidence is selected, "the first impulse" or preliminary assurance from an impression is distributed equally among the live possibilities so that "each partakes an equal share of that force and vivacity, that is deriv'd from the impulse" (T 1.3.12.10; SBN 134). From here, the evidence is weighed, i.e., *balanced*, which cancels live possibilities of contrary types along with their attendant assurance. The result is a matter of fact judgment proportioned to the evidence of past experience, viz., "one single idea or image, which is intense and lively in proportion to the number of experiments from which it is deriv'd" (T 1.3.12.22; SBN 139-40).[12] In this way, the content and degree of *resultant* assurance for any matter of fact judgment is fixed by the nature of the evidence that is selected and balanced.

Where the selected evidence is uniform, the live possibilities are all of the same type and no preliminary assurance is lost in balancing. In such cases we secure the full assurance of a "proof," which is the mark of a judgment reached by causal reasoning (T 1.3.11.2; SBN 124). Where the selected evidence is "contrary," some of the live possibilities are of *contrary* types and some preliminary assurance must be lost in balancing. In such cases we secure the less than full assurance of a probable judgment, which is the mark of a judgment reached by probable reasoning (T 1.3.11.2, 1.3.12.22; SBN 124, 139-40).[13] However, because past experience is the

[12] As we saw in the last chapter, Hume's full explanation of this calls attention to the *cancelling* that happens in weighing, remarking that assurance for probable judgments "is intense and lively in proportion to the number of experiments from which it is deriv'd, *and their superiority above their antagonists*" (T 1.3.12.22; SBN 139-40, my emphasis)

[13] Strictly speaking, as we saw in the last chapter, we secure a diminished degree of less than full assurance for a judgment about a single event, which is given by the number of live possibilities that survive balancing.

standard for matter of fact judgments, we reach the right judgment only when it is made in conformity with the *relevant* past experience.

Whether a causal or probable judgment is made in conformity with relevant past experience depends on whether our causal and probable reasoning is legitimate. In general, matter of fact reasoning is legitimate only if (i) all and only the relevant evidence from past experience is selected and (ii) the selected evidence is accurately balanced. In matter of fact reasoning the apportioning of preliminary assurance and balancing of evidence is mechanistic and automatic, so condition (ii) is out of our hands.[14] Accordingly, the legitimacy of matter of fact reasoning turns entirely on whether all and only the relevant evidence is selected from past experience.

In the last chapter, we saw that the evidence for matter of fact reasoning is restricted by the uniformity principle, and that our selection of evidence from past experience is informed by our present aims and circumstances. So an obvious restriction on "relevant evidence" is that it must be available in past experience. In other words, to select an event-type as a live possibility, it must be the case that our past experience includes an event(s) of that type. With respect to experienced events, which ones are presently relevant depends on our present aims and actual

[14] Hume makes it especially clear that the distribution of preliminary assurance and the balancing of live possibilities is out of our hands with the following passages. "And according as these contrary chances diminish, and the superiority encreases on the other side, his belief acquires new degrees of stability and assurance" (T 1.3.11.9; SBN 127-28). "The impulses of the former are, therefore, superior to those of the latter. But as the events are contrary, and 'tis impossible both [can occur]; the impulses likewise become contrary, and the inferior destroys the superior, as far as its strength goes" (T 1.3.11.13; SBN 129-30). "As to the manner of their *opposition*, 'tis evident, that as the contrary views are incompatible with each other, and 'tis impossible the object can at once exist conformable to both of them, their influence becomes mutually destructive, and the mind is determin'd to the superior only with that force, which remains after substracting the inferior" (T 1.3.12.19; SBN 137-38, Hume's emphasis). "When we transfer contrary experiments to the future, we can only repeat these contrary experiments with their particular proportions; which cou'd not produce assurance in any single event, upon which we reason, unless the fancy melted together all those images that concur, and extracted from them one single idea or image, which is intense and lively in proportion to the number of experiments from which it is deriv'd, and their superiority above their antagonists" (T 1.3.12.22; SBN 139-40).

circumstances. In particular, recollected events are relevant only if they are of a type that is a live possibility with respect to our actual circumstances given our present aims. Accordingly, we reason *from the right evidence* when we select all and only events of a type that are live possibilities given our present aims and circumstances.

For instance, suppose that with my accounting duties complete, I'm walking to my car and trying to figure out what time I'll reach home. Experience in similar circumstances shows that I usually arrive home around 6:00 p.m. However, accidents have occasionally brought traffic to a standstill and delayed my arrival until after 6:00 p.m. Consideration of these live possibilities of contrary types leaves me with a high, but less than full, degree of assurance that *I'll arrive home by 6:00 p.m.* If I've selected all and only the live possibilities given my actual circumstances and present aims, then the right evidence has been selected and balanced. When the right evidence is selected and balanced, we reach the right judgment from legitimate matter of fact reasoning, viz., a judgment made in conformity with all and only the evidence from past experience that is presently relevant. Then supposing I've reasoned legitimately, I've rightly judged that *I'll arrive home by 6:00 p.m.*

We've seen how a *precise* and *infallible* standard of equality grounds the possibility of demonstrative certainty (T 1.3.1.5; SBN 71). But we've also seen that even the best matter of fact judgments fall short of certainty. Because the standard of past experience is *imprecise* and *fallible*, legitimate matter of fact reasoning is no guarantee of truth. To say that the standard is "imprecise" is to note that the contrary of any matter of fact is conceivable, a point of contrast with demonstrations that Hume is careful to mark:

> What is demonstratively false implies a contradiction; and what implies a contradiction cannot be conceived. But with regard to any matter of fact, however strong the proof may be from experience, I can always conceive the contrary. (A 18; SBN 652-53)

In matter of fact reasoning, we take the uniformity principle for granted, viz., that the future will resemble the past. But as Hume notes, "[w]e can at least conceive a change in the course of nature" (T 1.3.6.5; SBN 89). As such, any judgment reached by causal or probable reasoning is *possibly* false, even if it is made in conformity with relevant past experience.[15]

To say that the standard of past experience is "fallible" is to note that reasoning in conformity with it will sometimes yield a judgment that is *actually* false. Hume gives an excellent example of this in the *Enquiry*:

> One, who in our climate, should expect better weather in any week of June than in one of December, *would reason justly, and conformably to experience*; *but it is certain, that he may happen, in the event, to find himself mistaken*. (E 10.3; SBN 110, my emphasis)[16]

Making a similar point, Hume says that in refusing to believe reports of water freezing, the Indian Prince "reasoned justly" (EHU 10.10; SBN 113-14). The takeaway is that when we reason in accordance with a fallible standard we will sometimes make judgments that turn out to be false. In "Of scepticism with regard to reason" Hume calls this the "original uncertainty inherent" in probable reasoning (T 1.4.1.6; SBN 182-3). But despite this original uncertainty, when we reason "justly, and conformably to experience," it is not the case that we should have

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[15] "We can at least conceive a change in the course of nature; which sufficiently proves, that such a change is not absolutely impossible. To form a clear idea of any thing, is an undeniable argument for its possibility, and is alone a refutation of any pretended demonstration against it" (T 1.3.6.5; SBN 89).

[16] References to the first *Enquiry* are to David Hume, *An Enquiry concerning Human Understanding: A Critical Edition*, ed. Tom L. Beauchamp (Oxford: Clarendon Press, 2000), cited as "EHU" followed by section and paragraph number, and to *Enquiries Concerning Human Understanding and Concerning the Principles of Morals*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 3rd ed. (Oxford: Clarendon Press, 1975), hereafter cited as "SBN" followed by page number.

reasoned differently. If we shouldn't have reasoned differently, then we haven't made any error in reasoning. Then so long as we reason *legitimately*, we arrive at the right judgment regardless of its truth or falsity. Hence, truth and falsity are not the marks of good and bad matter of fact reasoning.

What matters in assessing matter of fact errors is not the truth or falsity of our judgments, but whether they have been reached by illegitimate reasoning. Because the balancing of selected evidence is not under our direct control, our matter of fact reasoning is illegitimate only when we reason from the wrong evidence. Consequently, the single type of error in causal and probable reasoning is an *evidence selection error*.

Broadly speaking, we make an evidence selection error only if we fail to select the evidence from past experience best suited to our present aims given our actual circumstances. This helps to explain why the Indian Prince made no error in reasoning even though he arrived at a false judgment. The relevant experience needed for judging that water freezes was inaccessible to the Prince. Insofar as he selected the best available evidence given his past experience, the Prince "reasoned justly." Because it is not the case that he should have reasoned differently, it's not the case that he made any error in reasoning.

More precisely, we make an evidence selection error when we fail to select the set of all and only those confirmed possibilities that are live possibilities which are best suited to our present aims given our actual circumstances. We might fail in this regard in one of three ways:

(1) **Including Irrelevant Evidence**:
The selected evidence includes a confirmed possibility that is not presently a live possibility

(2) **Excluding Relevant Evidence**:
The set of selected evidence doesn't include all of the confirmed possibilities that are presently live possibilities

(3) **Imprecisely Relevant Evidence:**
The set of selected evidence includes all and only confirmed possibilities that are presently live possibilities, but only a *subset* of these are best or *precisely* suited to present aims given the actual circumstances

The following three cases illustrate these three ways of making an evidence selection error and, thus, three ways in which we might reach the wrong matter of fact judgment.

A case from one of my own failures in causal reasoning provides an illustration of (1). A few years ago I was helping a friend install a dock. To get the dock to the waterfront we had to clear a path through the backyard, which required moving some patio furniture and landscaping rocks. From uniform past experience with rocks of that size, I concluded they would be heavy. Careful to avoid injury I bent at the knees and wrapped my arms around one of them. But as I heaved the "rock" from the ground, I nearly threw it over my head. Having forgotten about my friend's cleverly disguised outdoor sound system, what I took for a rock was actually a speaker. As such, the set of evidence I selected from past experience was irrelevant given my actual circumstances. More precisely, the set of uniform evidence consisted of an event-type (i.e., heavy-rock events) that was not a live possibility given my actual circumstances (i.e., speaker event). By reasoning from the wrong evidence, I reached the wrong judgment—something I discovered when I picked up the speaker. In general, we make an evidence selection error and reach the wrong judgment from illegitimate matter of fact reasoning whenever irrelevant evidence is included in the selected evidence.

To give an example of (2) we'll consider a case of probable reasoning where the selected evidence fails to include *all* of the relevant evidence. Suppose Bill asks me what time I'll arrive at his party and I respond with the following: "Ted is picking me up at 7:00 p.m., and since he is never late, we'll be there by 8:00 p.m." Suppose that in reply Bill reminds me that two months ago I was late to Rufus' party because Ted failed to pick me up on time. Reminded of this I

realize that in responding to Bill I failed to consider *all* of the relevant evidence. More precisely, I excluded an event-type that is presently a live possibility given my actual circumstances. Prompted by Bill's reminder I realize that I've reached the wrong judgment by reasoning from the wrong evidence. In general, we make an evidence selection error and reach the wrong judgment from illegitimate matter of fact reasoning whenever we exclude relevant evidence.

Finally, to illustrate (3) we can use my probable judgment that *I'll arrive home by 6:00 p.m.* Suppose that in making this judgment I've forgotten that it's Memorial Day weekend—a time when traffic is particularly heavy. Had I recalled this fact, I would have considered only a subset of the evidence I actually selected, e.g., all and only those events of a *driving-home-on-Memorial-Day-weekend* type. In other words, given my *actual* circumstances an alternative set of evidence was better, i.e., more precisely, suited to my present aims. As such, I made an evidence selection error and reached the wrong judgment—something I realize when the heavy traffic reminds me of the holiday. In general, we make an evidence selection error and reach the wrong judgment from illegitimate matter of fact reasoning whenever the selected evidence is imprecisely relevant given our present aims and actual circumstance.

The foregoing cases show the different ways we might make an evidence selection error while reinforcing the point that truth and falsity are not the marks of good and bad matter of fact reasoning. It may well be that in cases like those outlined above, our judgments from illegitimate matter of fact reasoning turn out to be true. But regardless of whether the speaker turned out to be heavy or I arrived home by 6:00 p.m. or Ted was on time, these judgments were reached by reasoning from the wrong evidence. And whenever we reason from the wrong evidence, we reach the wrong judgment even if it turns out to be true.[17]

[17] This may be less clear in the case of causal reasoning, though altering the speaker case to include the fact that the speaker was in fact heavy shows how a true causal judgment might follow from an error in causal reasoning.

What's more, we reach the wrong judgment even if reasoning from the right evidence *would have* produced a judgment with the same content. For example, suppose that selection of all and only the relevant evidence would have delivered the judgment that *I will arrive home by 6:00 p.m.* Nevertheless, if I've selected the wrong evidence, my actual judgment was made in conformity with a different set of experienced events. Insofar as my actual judgment fails to be proportioned to all and only the *relevant* past experience, it is the wrong judgment. Thus, irrespective of its truth or content, we reach the wrong judgment from illegitimate matter of fact reasoning whenever we reason from the wrong evidence.

So far we've identified the single type of error for matter of fact reasoning and how things like inattention, forgetfulness, and misperception might cause us to make an evidence selection error. Additionally, we've seen that the frustration of present expectations is a familiar route for the detection of these errors. The following cases, which I hope are scenarios everyone will find familiar, are meant to encourage additional thoughts about potential causes of evidence selection errors as well as alternative routes for their detection.

Distraction/Forgetfulness:

> Suppose I'm trying to decide where to have dinner and I settle on the Thai place up the street. While it's usually crowded, I'm often able to get a table without waiting. Reflecting on past experience I judge that I'll secure a table without waiting. However, when I arrive at the restaurant and find that it's closed, I'm reminded that it's Monday—the only day of the week the restaurant doesn't operate. Had I taken this into consideration I'd have considered an alternative set of evidence and would have made a different judgment. As it turns out, the evidence I selected was irrelevant given my actual circumstances.

Wishful-Thinking/Denial:

> Suppose I'm running late, and while driving to campus I recall that it's game-day. Past experience suggests that securing good parking on game-days tends to be difficult. However, suppose I have an important meeting and that I'll be on time only if I secure good parking. Under the pressure of the present circumstances, I find myself focusing on those rare instances where I've secured good parking on past game-days and convince myself that my present circumstances are relevantly similar. As a result, I judge that I'll

> secure good parking. When I fail to secure good parking I realize that I've reasoned illegitimately—feeling the pressure of my present aims I excluded a number of past events that were relevant given my actual circumstances.

Confusion/Memory:

> Suppose I'm driving to campus and I recall (correctly) that it's the Friday before Spring Break. Past experience suggests the campus will be especially crowded, so I judge that I won't secure good parking. However, when I arrive on campus I find the parking lot nearly empty. I realize my mistake once a colleague reminds me of the difference between *Spring Break*, i.e., a time when most students leave, and *Spring Weekend*, i.e., a time when the campus is overrun with people. In this case, I was right about my actual circumstances given that it was actually the Friday before Spring Break. But in confusing this event with Spring Weekend, an alternative set of evidence was better suited to my present aims.

The common thread in each of these cases is that from "the irruption of other causes, and by the inconstancy of [my] mental powers," an evidence selection error caused me to reach the wrong judgment (T 1.4.1.1; SBN 180). So our list of potential causes of evidence selection errors includes distraction, fatigue, forgetfulness, confusion, inattention, misperception, blind optimism, or some combination of these. In general, we discover that we've reached the wrong matter of fact judgment when we fail to achieve our present aims or when we realize that our actual circumstances are otherwise than we have supposed. As the cases in this section help to show, discovering that we've reached the wrong judgment reveals not only that we've made an evidence selection error but also how it could have been avoided by selecting a different set of evidence.

With these final pieces in place we now have a complete account of errors in matter of fact reasoning. So when Hume prompts us to reflect on our errors in causal and probable reasoning, he is asking us to recall instances where (a) causes such as distraction or forgetfulness led to (b) an evidence selection error such that (c) we arrived at the wrong judgment from illegitimate reasoning, which (d) we discovered upon learning our present circumstances were otherwise than we supposed or when we failed to achieve our aims.

Putting this together with the last section gives us a comprehensive account of errors in reasoning with respect to a Humean framework. In general, errors in reasoning are of two types, viz., rule-application errors and evidence selection errors. In demonstrative reasoning we're susceptible to both types of error while in matter of fact reasoning we're susceptible only to the latter type. Since errors of each type are detectable, we're able to recall them for the purposes of Hume's skeptical arguments against reason. However, before turning to those arguments, I need to address a challenge to my account of errors in reasoning.

V. A Possible Rule-Application Error in Probable Reasoning

Interpreters have tended to overlook the importance of identifying particular errors in reasoning for the purposes of Hume's skeptical arguments. Don Garrett, however, is a notable exception. On my account, assurance for any matter of fact judgment is naturally and mechanistically proportioned to the selected evidence such that we make an error only when we select something other than all and only the relevant evidence. In contrast, Garrett suggests a kind of rule-application error that causes assurance for probable judgments to be *inaccurately* proportioned to the selected evidence. As Garrett (2006) describes it, error-free probable reasoning yields a "standard degree" of assurance that is accurately proportioned to the evidence.[18] When we make an error, our "actual degree" of assurance is something other than the "standard degree." We can describe this as a case where the evidence is mistakenly *balanced* to yield a judgment with the wrong degree of assurance.[19] On this picture, the mark of an error

[18] Above I offer a sketch of the proposal, but for Garrett's (2006) full description see pp. 161-62. For a similar but slightly less detailed account, see Garrett (1997) pp. 224-25.

[19] This could be due to improperly apportioning preliminary assurance or inaccurately balancing and cancelling contrary possibilities. However, as I say below, since both the apportioning of preliminary assurance and the balancing and cancelling of contrary possibilities is mechanistic and not under our direct control, it is unclear how

in probable reasoning is a judgment made with a non-standard degree of assurance that isn't proportioned to the evidence.

As I understand it, there are at least three problems with Garrett's proposal. First, as the examples from the last section make clear, Garrett's proposal is at least incomplete. After all, it's not the case that all evidence selection errors can be explained in terms of the inaccurate proportioning of assurance. For instance, in the case of my friend's speaker, my judgment was the product of illegitimate reasoning but it was accurately proportioned to the selected evidence. In that case, my judgment was made with a standard degree of assurance.

This points to a second problem in that Garrett's proposal seems to rule-out the possibility of errors in causal reasoning, i.e., cases where the selected evidence is uniform such that the inaccurate proportioning of assurance is not a possibility. However, Hume is clear that even if "the same objects [were] always conjoin'd together," we would still need to worry about "the mistakes of our own judgment" (T 1.3.12.4; SBN 131). In other words, even if all matter of fact reasoning was carried out with respect to sets of uniform evidence, we would still have to worry about evidence selection errors.

Third, and finally, I've argued that both the content and degree of assurance for matter of fact judgments is determined by the nature of the selected evidence.[20] Because assurance

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we might make this error or, supposing that we sometimes do, that it should be understood as an error in reasoning.

[20] There are two passages in which Hume is clearest on this matter. First, from "Of the probability of causes": "When we transfer contrary experiments [or rival possibilities] to the future, we can only repeat these contrary experiments with their particular proportions; which cou'd not produce assurance in any single event, upon which we reason, unless the fancy melted together all those images that concur, and extracted from them *one single idea or image, which is intense and lively in proportion to the number of experiments from which it is deriv'd*, *and their superiority above their antagonists*" (T 1.3.12.22; SBN 139-40, my emphasis). In other words, balancing rival possibilities cancels rivals and their attendant assurance to yield a judgment with the content given by the type of live possibility that survives balancing, and a degree of assurance diminished by cancellation. Second, from "Of unphilosophical probability": "[I]n all determinations, where the mind decides from contrary experiments, 'tis first divided within itself, and has an inclination to either side *in proportion to the number of experiments we have seen and remember*. This contest is at last determin'd to the advantage of that side, *where we observe a superior*

"encreases or diminishes according to the number of chances or past experiments," our assurance for matter of fact judgments is fixed by the evidence *actually* selected. So any worry that a judgment was made with the wrong degree of assurance is actually a worry that it was reached by selecting and balancing the wrong evidence. While these three points raise serious concerns about Garrett's proposal, Hume's discussion of unphilosophical probability appears to provide support for something like it.

We said that, for Hume, an "unphilosophical probability" is an unphilosophical source of uncertainty. In the last chapter, we saw that judgments from *philosophical* probabilities are uncertain because they are proportioned to contrary evidence.[21] We explained this by saying that the uncertainty of these judgments is attributable to the uncertain nature of the evidence that grounds them. In contrast, the uncertainty of a judgment from an unphilosophical probability is attributable to human nature rather than the evidence that grounds the judgment. Accordingly, uncertain judgments from unphilosophical sources of uncertainty aren't proportioned to the relevant evidence.

In total, Hume identifies four distinct unphilosophical probabilities: (i) fading memories, (ii) particularly striking experiments, (iii) especially complicated arguments, and (iv) unreflective generalizations. At the close of his discussion, Hume suggests that judgments from unphilosophical probabilities are *errors* of some kind. What's more, three out of the four affect the assurance with which a judgment is made. This is suggestive of something like a rule-

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number of these experiments [or live possibilities]; *but still with a diminution of the force in the evidence correspondent to the number of the opposite experiments* [or live possibilities of a rival type]. Each [live] possibility, of which the probability is compos'd, operates separately upon the imagination; and 'tis the larger collection of [live] possibilities [of the same type], which at last prevails, and that with a force proportionable to its superiority [over the collection of live possibilities of a rival type] (T 1.3.13.20; SBN 154-5).

[21] However, as the examples from the last section make clear, a judgment may be proportioned to the selected evidence but still be the product of error, viz., an evidence selection error.

application error for matter of fact reasoning, which appears to provide support for something like Garrett's proposal. If that's right, then I've overlooked anywhere from one to four types of probable errors.

But careful consideration of Hume's discussion shows that we need to distinguish *errors in reasoning* from what I'll call *natural errors*. Judgments from philosophical probabilities are proportioned to sets of contrary evidence. Because probable judgments are proportioned in accordance with it, contrary evidence is a philosophical source of uncertainty. When the *wrong* set of contrary evidence is selected and balanced, a judgment proportioned to that evidence is mistaken. Accordingly, mistaken judgments from philosophical probabilities are the result of evidence selection errors. Insofar as they are brought on by our activities as reasoners, evidence selection errors are *avoidable* errors in reasoning. On the other hand, mistaken judgments from unphilosophical probabilities are caused by human nature, e.g., human limitations and susceptibilities. Insofar as they are forced on us by nature, these *natural errors* are unavoidable. Because they're the unavoidable products of nature, it's a mistake to treat natural errors as instances where "our *understanding* has deceiv'd us" (T 1.4.1.1; SBN 180, my emphasis).

VI. Unphilosophical Probabilities as a Source of Natural Errors

With the first unphilosophical probability Hume is concerned to explain how the same matter of fact argument might produce differing degrees of resultant assurance when considered at different times. We've seen that a present impression is the foundation that supplies preliminary assurance for our matter of fact reasoning. Because a "lively impression produces more assurance than a faint one," a recent lively memory is attended by more assurance than a remote or faded memory (T 1.3.13.2; SBN 143-4). Where a memory supplies preliminary

assurance for a matter of fact argument, as the memory fades there is less preliminary assurance to distribute among the selected live possibilities. So an argument "which we found on any matter of fact we remember" will produce varying degrees of resultant assurance depending upon when it's considered (T 1.3.13.1; SBN 143). In that case, *the same argument* will be "more or less convincing, according as the fact [or memory] is recent or remote" (T 1.3.13.1; SBN 143). Where an argument is less convincing (i.e., less certain) simply because it is run at a later time, the uncertainty of the judgment doesn't reflect the uncertainty of the evidence. Hence, judgments from this first unphilosophical source of uncertainty are not proportioned to the evidence.

Regarding the second unphilosophical probability, Hume notes how a particularly striking "experiment, that is recent and fresh in the memory" sometimes exerts an unequal influence and "affects us more than one that is in some measure obliterated" (T 1.3.13.2; SBN 143-4). Here it's important to mark the contrast between a matter of fact argument and the "experiments," i.e., witnessed events, on which these arguments are grounded. In matter of fact reasoning, *live possibilities* selected from past experience are taken into consideration. The first unphilosophical probability explains variations in assurance for the *conclusion* of an argument by way of variations in the liveliness of the impression that supplies the preliminary assurance. The second unphilosophical probability explains variations in the influence of individual experiments by way of variations in their liveliness.

Insofar as they are confirmed possibilities or witnessed events, individual experiments carry equal weight. But in some cases, an especially striking event will exert an influence superior to that of others. To illustrate, Hume cites a "drunkard, who has seen his companion die of a debauch" (T 1.3.13.2; SBN 143-4). Witnessing this striking event forms a strong

association between drinking and death. As a result, the drunkard "is struck with that *instance* for some time, and dreads a like accident for himself" (T 1.3.13.2; SBN 143-4, my emphasis). In other words, for a time this striking experiment is weightier than other individual experiments and "has a superior influence on the judgment" of the drunkard (T 1.3.13.2; SBN 143-4). However, "as the memory of it decays away by degrees, his former security returns, and the danger seems less certain and real" (T 1.3.13.2; SBN 143-4).

The choice of a drunkard is unfortunate in that it obscures Hume's point. After all, it seems like a bad thing when our drunkard's "former security returns." But we can clarify Hume's point by shifting cases. Someone who has been in a serious car accident often struggles against the undue influence exerted by that striking "experiment."[22] Just the thought of being in a car brings the accident to mind and causes a degree of anxiety. In this way, a particularly striking experiment "has a superior influence on the judgment, as well as on the passions" (T 1.3.13.2; SBN 143-4).[23] Accordingly, a *single experiment* sometimes exerts an influence that is *superior* to other relevant experiments.[24] Where a single experiment grounds judgments and expectations to the exclusion of other relevant experiments, our judgments are not proportioned to the relevant evidence. So judgments from this second source of uncertainty are unphilosophical in that they are not proportioned to the relevant evidence.

[22] Hume doesn't mention this but it is worth noting that we often struggle and work against the undue influence of a single experiment by reminding ourselves of numerous relevant contrary experiments, e.g., where car travel has not been conjoined with an accident.

[23] I take it we might also explain gambling habits in this way. Winning at a game of chance is a particularly striking experiment. For a time (usually until the money is gone) this experiment outweighs other relevant experiments and exerts an undue influence over a person's judgment.

[24] However, as the memory fades so too does the superior influence and, eventually, a particularly striking experiment comes to play the role of an equal experiment—one live possibility among other relevant contrary possibilities. In that case, we should note that the first unphilosophical probability would seem to supply an account of how the influence of the second is corrected, viz., by way of a fading memory.

We appealed to the third unphilosophical probability for our example in the last chapter. There we saw Hume explain how variations in the *length* or complexity of matter of fact arguments produce variations in resultant degrees of assurance for their conclusions:

> 'Tis certain, that when an inference is drawn immediately from an object, without any intermediate cause or effect, the conviction is much stronger…than when the imagination is carry'd thro' a long chain of connected arguments (T 1.3.13.3; SBN 144).

As Hume describes it, increasing the length of an argument increases the burden on the reasoner. Preserving the preliminary assurance supplied by a present impression through many steps requires keeping each intermediate step in mind. As the number of steps increases, this becomes more difficult, "and 'tis evident this vivacity must gradually decay in proportion to the distance, and must lose somewhat in each transition" (T 1.3.13.3; SBN 144). Accordingly, our assurance (if any) for conclusions from long or complicated arguments isn't proportioned to the evidence.[25] Insofar as they fail to be proportioned to the evidence, judgments from this third source of uncertainty are unphilosophical.

Hume remarks that the fourth and final unphilosophical probability is "deriv'd from *general rules*, which we rashly form to ourselves" (T 1.3.13.7; SBN 146-7). He explains that when we witness the conjunction of two objects, habit and custom take over and the imagination "passes from the first to the second, by a natural transition, which precedes reflection, and which cannot be prevented by it" (T 1.3.13.8; SBN 147). Consequently, we're prone to the formation of beliefs and expectations from the habitual supposition of a causal link even where the conjunction is "superfluous" or "accidental" (T 1.3.13.9; SBN 147-8). As Hume describes them,

[25] Indeed, regarding complex arguments Hume contends that "'tis seldom such reasonings produce *any* conviction" (T 1.3.13.3; SBN 144, my emphasis).

these unreflective generalizations deliver judgments from what I've called "direct reasoning," where a judgment follows directly from custom and habit.

By way of an example, Hume claims that *prejudice* can be explained as the result of these unreflective generalizations. For instance, after meeting a witless American I might unreflectively expect that my next encounter with an American will be conjoined with witlessness. That is, I might form a general rule or expectation that *Americans are witless* (T 1.3.13.7; SBN 146-7). Earlier in the *Treatise* Hume has explained how a general rule such as this might emerge from a single event:

> [T]ho' we are here suppos'd to have had only one experiment of a particular effect, yet we have many millions to convince us of this principle; *that like objects, plac'd in like circumstances, will always produce like effects*; and as this principle has establish'd itself by a sufficient custom, it bestows an evidence and firmness on any opinion, to which it can be apply'd. (T 1.3.8.14; SBN 104-5, Hume's emphasis)

Along similar lines, Hume explains our rashly formed general rules as the result of custom and habit:

> ['T]is the nature of custom not only to operate with its full force, when objects are presented, that are exactly the same with those to which we have been accustom'd; but also to operate in an inferior degree, when we discover such as are similar. (T 1.3.13.8; SBN 147)

Because of this, an experienced conjunction of *witlessness* and *American* is liable to produce a general rule that causes my expectation of encounters with Americans to be conjoined with encounters of witlessness.

What's more, these general rules tend to be resistant to contrary evidence. That is, we tend to persist in them "even contrary to present observation and experience" (T 1.3.13.8; SBN 147). In other words, when a bright American engages me in conversation this won't necessarily expose, dislodge, or even militate against the influence of the general rule. Accordingly, when we follow general rules, our judgments and expectations are not proportioned to the relevant evidence. Consequently, this fourth source of uncertainty is unphilosophical insofar as it produces judgments that are not proportioned to the evidence.

Hume claims that when we form and are influenced by unreflective general rules, a type of *error* has been made, and he adds that "Human nature is very subject to errors of this kind" (T 1.3.13.7; SBN 146-7). Fortunately, he goes on to say that these errors can be *corrected* "by reflection on the nature of those circumstances" wherein the general rule was formed, which works to "correct this propensity," viz., the expectation arising from the influence of the rule (T 1.3.13.9; SBN 147-8).

When Hume talks about correction here, he is describing the corrective influence of one type of general rule over another type of general rule.[26] The latter type of *correctable* rules are general rules of the imagination:

> When an object appears, that resembles any cause in very considerable circumstances, the *imagination* naturally carries us to a lively conception of the usual effect, tho' the object be different in the most material and most efficacious circumstances from that cause. Here is the first influence of general rules. (T 1.3.13.12; SBN 149-50, my emphasis)

The former type of *corrective* rules are general rules of the understanding:

[26] For an extended examination of Hume's general rules, see Thomas Hearn (1976).

> [W]hen we take a review of this act of the mind, and compare it with the more general and authentic operations of the *understanding*, we find it to be of an irregular nature…which is the cause of our rejecting it. This is a second influence of general rules, and implies the condemnation of the former. (T 1.3.13.12; SBN 149-50, my emphasis)

So a fuller explanation of the fourth unphilosophical probability tells us that habit and custom are sometimes responsible for the formation of erroneous general rules of the imagination that may be corrected by an appeal to general rules of the understanding.

In closing, Hume remarks that "'tis only by following [general rules] that *we can correct this, and all other unphilosophical probabilities*" (T 1.3.13.12; SBN 149-50, my emphasis). The claim that general rules of the understanding provide a way to correct for the influence of "all" unphilosophical probabilities suggests that all unphilosophical probabilities are a source of error. If judgments from unphilosophical sources of uncertainty are errors, this would seem to suggest that they are relevant for Hume's skeptical arguments against reason. At the same time, this would put pressure on us to include Garrett's proposed error. After all, the suggestion that an error in probable reasoning yields a judgment made with a non-standard degree of assurance is relevantly similar to the effects produced by the first three unphilosophical probabilities.

While judgments from unphilosophical probabilities are produced by errors of a kind, these are importantly different from errors in reasoning. The detection of an error in reasoning is attended by the realization that we *should* have reasoned differently and, crucially, that we *could* have avoided the error by doing so. Accordingly, the detection of an error in reasoning, along with reflection on past errors in reasoning, confirms that they are *avoidable*. On the other hand, the discovery that an unphilosophical probability has led to a mistaken judgment isn't met with

the realization that we should have done things differently *because there is nothing we can do to avoid these mistakes*.[27]

For instance, we can't keep memories from fading or striking events from exerting a superior influence on us. We can't help it that complex arguments are difficult to follow and that we naturally expect the conjunction of objects even where their conjunction is accidental. In short, the influence of unphilosophical probabilities is *unavoidable*. Though we can try to correct for their influence once it's been detected, "'tis still certain, that custom takes the start, and gives a biass to the imagination" (T 1.3.13.9; SBN 147-8). From here we can identify two significant points of contrast which allow for distinguishing *errors in reasoning* from what I'll call *natural errors*.

First, errors in reasoning are not persistent in that their detection is sufficient for correcting or revising the mistaken judgments they cause. When we reason, we usually take for granted that we're reasoning from the right evidence and in the right way. Because of this, we're usually surprised to discover that we've made the wrong judgment. Nevertheless, the discovery that we've reached the wrong judgment by reasoning from the wrong evidence or in the wrong way is sufficient for revising or rejecting the mistaken judgment. In other words, the detection of an error in reasoning is sufficient for correcting the mistake.

For instance, when my colleague points out that I've overlooked one of the company's receipts, this automatically leads to the revision (or rejection) of my judgment that *the company is $30,000 in debt*. In other words, I no longer find myself inclined to believe my mistaken conclusion. We can put this by saying that we labor under the influence of errors in reasoning and persist in our mistaken judgments only so long as our errors remains undetected.

[27] That is, aside from, for instance, avoiding arguments grounded on impressions of memory or of any notable length and complexity.

Accordingly, mistaken judgments reached by illegitimate reasoning are not *persistent* insofar as their detection is sufficient for their correction or revision.[28]

Not so with our mistaken judgments from unphilosophical probabilities. When we mark the undue influence of a single experiment like a recent car accident or admit our inability to follow a complicated argument, this does nothing to correct the *error*.[29] That is, unlike errors in reasoning, unphilosophical probabilities exert a persistent influence where detection does nothing to correct our mistaken judgments. Instead, when a judgment is discovered to be the result of an unphilosophical probability, further steps are needed to correct it—hence Hume's appeal to the corrective mechanism of general rules of the understanding. So unlike our avoidable errors in reasoning, the unavoidable influence of unphilosophical probabilities is *persistent* such that detection is insufficient for correction or revision.

Second, because errors in reasoning are avoidable they are also *retrospectively correctable*. Because they are introduced by our activities as reasoners, in particular, our selection and handling of evidence, errors in reasoning are avoidable. So my rule-application errors and evidence selection errors are appropriately described as *my errors* (and yours are *your errors*) because they *could* have been avoided if only I had done things differently. When I realize that I've overlooked one of the company's receipts, or recall that it's Memorial Day, or pick up my friend's rock-speaker, I realize I've made the wrong judgments by reasoning from the wrong evidence or in the wrong way. But through their detection, we discover how errors in

[28] I take it there is both a causal and normative aspect here—we can't help but relinquish such judgments and, at the same time, we recognize that we *ought* to relinquish such judgments.

[29] Hume provides a further example of this with when he remarks that a man "hung out from a high tower in a cage of iron cannot forebear trembling…'tho he knows himself to be perfectly secure from falling…The circumstances of depth and descent strike so strongly upon him, that their influence cannot be destroy'd by the contrary circumstances of support and solidity, which ought to give him perfect security" (T 1.3.13.10; SBN 148-9). Put differently, this sort of error persists in spite of its detection as a result of custom and habit.

reasoning could have been avoided and, thus, what should have been done to avoid them. Accordingly, errors in reasoning are correctable in retrospect, which is to say, they are retrospectively correctable.

In contrast, because unphilosophical probabilities are unavoidable, judgments caused by them are not retrospectively correctable. We've seen that mistaken judgments from unphilosophical probabilities are not the result of our activities as reasoners. Rather, they are forced on us by nature in the form of human limitations of memory and cognition alongside our susceptibility to habit and custom. Because mistaken judgments from unphilosophical probabilities are attributable to *nature*, their detection fails to reveal that we should have done things differently. In that case, they are not the sorts of errors we *could* avoid and, thus, it is not the case that we *should* avoid them.

Instead, mistaken judgments from unphilosophical probabilities are like mistaken judgments from unavoidable perceptual illusions. To borrow an example from Hume, a building's size appears to change as our proximity to it changes. Though we're aware of this "error," it is *persistent* insofar as we can't help but see the building's size as changing. However, an appeal to general rules of the understanding helps to correct for the influence of these perceptual illusions. As Hume puts it, "the understanding corrects the appearances of the senses, and makes us imagine, that an object at twenty foot distance seems even to the eye as large as one of the same dimensions at ten" (T 1.3.10.12; SBN 632). Because we cannot avoid them, all we can do is *correct for* our mistaken judgments from perceptual illusions. Like perceptual illusions, mistaken judgments from unphilosophical probabilities are errors that we can *correct for* but cannot avoid. Hence, unlike mistaken judgments from errors in reasoning, mistaken

judgments from unphilosophical probabilities are unavoidable and persistent errors that can't be retrospectively corrected.

Hume remarks that philosophers don't accept unphilosophical probabilities as "*reasonable* foundations of belief" (T 1.3.13.1; SBN 143, my emphasis). Part of the reason for this is that unphilosophical sources of uncertainty give rise to judgments that aren't proportioned to the relevant evidence. But it's telling that Hume identifies these mistaken judgments with "unphilosophical probabilities" rather than errors in reasoning (T 1.3.13.1; SBN 143, my emphasis). Like perceptual illusions, unphilosophical probabilities are accidents of nature rather than errors of reason. Because they are forced on us by nature, mistaken judgments from unphilosophical probabilities are best understood as *natural errors* rather than instances wherein "our *understanding* has deceiv'd us" (1.4.1.1; SBN 180, my emphasis). So our mistaken judgments from philosophical probabilities, i.e., judgments proportioned to the wrong sets of contrary evidence, follow from errors in reasoning. But our mistaken judgments from unphilosophical probabilities, i.e., judgments that aren't proportioned to the evidence due to an accident of nature, follow from natural errors.

Given relevant similarities, the error proposed by Garrett looks to be a natural error rather than an error in reasoning. Garrett's suggestion is that assurance might be inaccurately proportioned to the selected evidence resulting in a probable judgment made with a non-standard degree of assurance. This effect is similar to what we saw with the second and third unphilosophical probabilities. However, the proportioning of assurance and balancing of evidence is custom driven and not under our direct control. If this wasn't the case, then either we wouldn't be susceptible to the influence of unphilosophical probabilities or we could simply correct them through an act of will. Since this is not the case, if it's possible that we sometimes

make probable judgments with a non-standard degree of assurance in the way Garrett supposes, this would seem to be an unavoidable and persistent error. In that case, we could only *correct for* this error and, thus, it is best understood as a *natural error*.[30] Because mistaken judgments from unphilosophical probabilities and Garrett's proposed error are natural and unavoidable, they are not errors in reasoning. Thus, they are not the sorts of errors that are relevant for the purposes of Hume's skeptical arguments against reason.

VII. Conclusion

To run the skeptical arguments against reason, Hume prompts us to reflect on past errors in reasoning. We've shown that *legitimacy* and *illegitimacy*, rather than truth and falsity, are the marks of good reasoning on the one hand and erroneous reasoning on the other. When we reason legitimately, we reach the right judgment by reasoning from the right evidence and in the right way. When we reason illegitimately, we reach the wrong judgment by either reasoning from the wrong evidence or in the wrong way. So our errors in reasoning are of two types, viz., rule-application errors and evidence selection errors. In demonstrative reasoning we're susceptible to errors of both types, while evidence selection errors are the sole type of error in matter of fact reasoning.

In developing a comprehensive account of errors in reasoning we've looked at several examples of how we might fall into error along with several ways we might detect them. But our examples also illustrated how the detection of an error in reasoning is met with the discovery of how the error could have been avoided. Noticing that errors in reasoning are detectable,

[30] Although, to correct for this sort of error it would need to be detectable. For my part, it is unclear how such an error could be detected. What sort of experience might reveal that I had considered all of the relevant evidence but made a judgment with the wrong degree of assurance?

avoidable, and retrospectively correctable gives us a way to distinguish them from sources of natural error such as unphilosophical probabilities and perceptual illusions. Because they are forced on us by nature, there is nothing we could do or should do to avoid natural errors.

But in addition to developing an account of errors in reasoning, we've hit on a crucial piece for solving the puzzle of Hume's skeptical arguments against reason. In the last section I said that we usually take for granted that we are reasoning from the right evidence and in the right way. Implicit in the examples presented throughout this chapter is that in making and accepting judgments we *presuppose* the legitimacy of our reasoning. It is because of this presupposition that we're surprised to discover we've reached the wrong judgment from illegitimate reasoning. But the detection of an error in reasoning shows that we've reasoned from the wrong evidence or in the wrong way, thereby revealing *the falsity of the presupposition that our present reasoning is legitimate*. So when we recall past errors in reasoning, as Hume's skeptical arguments against reason require us to do, we're recalling instances where we falsely presupposed the legitimacy of our reasoning.

This last point is the key to understanding how the skeptical arguments against reason are supposed to work. Hume calls on recollected errors in reasoning as evidence against any present *presupposition* of legitimacy. By undermining assurance for the presupposition that our present reasoning is legitimate, recollected errors diminish assurance for any judgment reached by our present reasoning. In the next chapter we'll see how this drives the arguments in "Of scepticism with regard to reason" and underwrites what I'll call Hume's claim of "inevitable diminishment."

Chapter 3

Epistemic Presuppositions and Inevitable Diminishment

I. Introduction

In "Of scepticism with regard to reason," Hume advances two skeptical arguments that threaten the extinction of all knowledge and belief (T 1.4.1.1, 1.4.1.6; SBN 180, 182-3).[1] The success of each argument rests on what I'll call Hume's claim of "inevitable diminishment." The rough idea is that our assurance for any judgment reached by reasoning inevitably diminishes when we reflect on past errors in reasoning. Hume provides a suggestive description of how this is supposed to work by way of a confession: "[w]hen I reflect on the natural fallibility of my judgment, I have less confidence in my opinions" (T 1.4.1.6; SBN 182-3).

I suspect we'd all agree that focusing on past errors in reasoning leaves us less sure of our judgments. Still, failures of reasoning are the exception rather than the rule. So it stands to reason that reflecting on past successes ought to restore confidence in our judgments. And this is what makes Hume's claim so striking: *diminishment is supposed to be the inevitable consequence of weighing our failures in reasoning together with our successes*.[2]

Because reasoning is usually reliable, Hume's claim has seemed, at best, terribly puzzling and, at worst, obviously wrong.[3] The aim of this chapter is to defend Hume's claim by showing

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[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number.

[2] As Hume puts it, diminishment inevitably follows when we "enlarge our view to comprehend a kind of history of all the instances, wherein our understanding has deceiv'd us, compar'd with those, wherein its testimony was just and true" (T 1.4.1.1; SBN 180).

[3] For variations on the "puzzling" reading see, for instance, MacNabb (1951) who draws precisely the opposite conclusion from Hume: "it seems evident to commonsense that the second-order judgement that I am very likely, though not certain, to be correct in some first-order judgement increases rather than diminishes the authority of that first-order judgement" (101). See also: Bennett (2001) p. 315, Foeglin (2009) pp. 46-48, Karlsson (1990) pp.

that we can actually make good sense of it. The key, I contend, is that assurance inevitably diminishes because to make and accept any judgment on the basis of reasoning we must *presuppose* that we are reasoning legitimately, viz., from the right evidence and in the right way.

Explicit consideration of the possibility that we're presently reasoning from the wrong evidence or in the wrong way, would undermine our present reasoning and keep us from making any judgment at all. Likewise, explicit consideration of the possibility that a judgment has been reached by illegitimate reasoning would keep us from accepting or standing pat with respect to that judgment. Thus, to make or accept any judgment on the basis of our present reasoning requires *presupposing* that our present reasoning is legitimate.

To presuppose legitimacy is to take it for granted as if we have full evidence in support. Recollected judgments reached by legitimate reasoning are evidence that this presupposition is true while recollected errors in reasoning are evidence that it's false. Because the legitimacy of our present reasoning is presupposed as if we have full evidence in support, the former evidence is *accounted* for in any present reasoning while the latter evidence is ignored. Consequently, recollected errors in reasoning are unaccounted-for evidence that our present reasoning is illegitimate and that we've presently made the wrong judgment. Consideration of any evidence that we've made the wrong judgment must diminish our assurance for that judgment. Thus, only evidence against a presupposition of legitimacy makes a difference to our judgments, and that difference must be one of diminishing our assurance for them. Put differently, diminishment is the inevitable consequence of weighing our failures in reasoning together with our successes.

124-27, Lynch (1996) pp. 92-93, and Owen (1999) p. 184. For variations on the "obviously wrong" reading see Fogelin (1985), pp. 18-19, and Loeb (2002), pp. 228-29. Morris (1989) offers what I take to be the standard reply to the "obviously wrong" reading (see pp. 51-52), but the interpretation I develop below paves the way for a general reply to each type of objection.

This defense of Hume's claim of inevitable diminishment unfolds in several steps over the next six sections. Section II. makes the case that a presupposition of reasoning is something whose truth is taken for granted such that any possibility or evidence to the contrary is ignored. From there, Section III. shows that something is a presupposition of one's present reasoning only if evidence against it is evidence that one has reached the wrong judgment. Section IV. identifies legitimacy as a relevant presupposition with respect to a Humean framework. We also discover that evidence against a presupposition of legitimacy is always available in the form of recollected errors in reasoning. In that case, to accept or stand pat with respect to a present judgment solely on the basis of our present reasoning is to ignore relevant evidence that we've made the wrong judgment.

By putting these pieces together, Hume's account of inevitable diminishment emerges in Section V. There we see that accounting for *all* relevant evidence means that any step of reasoning must be followed by a step of what I'll call *corrective reasoning*, so-called because Hume says it functions to "correct and regulate" a first judgment and "fix its just standard and proportion" (T 1.4.1.5; SBN 181-82). Corrective reasoning is a special case of probable reasoning where we balance the contrary evidence from recollected judgments, i.e., our failures in reasoning together with our successes (T 1.4.1.5; SBN 182). Given the contrary nature of the evidence, corrective reasoning fixes a degree of less than full assurance for the presupposition that our present reasoning is legitimate. This entails less than full assurance that we've presently reached the right judgment and, thus, diminishes our assurance for that judgment.

In Section VI. we look at two alternative procedures for dealing with the evidence from recollected errors in reasoning. While each aims to block diminishment, both proposals turn out to be unpromising in that they usher in Hume's skeptical conclusions in one fewer step. Finally,

Section VII. shows how this new understanding of inevitable diminishment helps to resolve two long-standing objections to Hume's skeptical arguments against reason.

II. Epistemic Presuppositions

In general, presupposing involves taking something for granted. This is familiar from our daily interactions. When we say "hello" to people we pass on the street, we presuppose or take for granted that they understand English.[4] Though our present concern is not with speaker or pragmatic presupposition, we are indeed interested in the presuppositions of *people*.[5] In particular, we're interested in what we might call their *epistemic* or *doxastic* presuppositions when making, accepting, or standing pat with respect to their judgments.[6]

Some familiar epistemic presuppositions of nearly any judgment we make are that our senses are working normally and that we're awake and undeceived by an evil demon. Because Hume's claim of inevitable diminishment specifically targets judgments from reason, our analysis will concentrate on presuppositions unique to reasoners, viz., those presuppositions required for the particular occasions and aims of their reasoning. To frame the discussion I'll

[4] See David I. Beaver and Bart Geurts "Presupposition", *The Stanford Encyclopedia of Philosophy* (Winter 2014 Edition), Edward N. Zalta (ed.), URL = http://plato.stanford.edu/archives/win2014/entries/presupposition/

[5] Here I mean to distinguish the presuppositions of *reasoners* from the presuppositions of *sentences* or *speakers*.

[6] This tends to be framed as a question of those presuppositions required for securing knowledge (or a claim to knowledge or successful knowledge attributions) and the appropriateness/inappropriateness of those presuppositions. For instance, see: David Lewis, "Elusive Knowledge," *Australasian Journal of Philosophy*, 74 no. 4 (1996): 549-567, Ram Neta, "Reflections on Reflective Knowledge," *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition*, 153, No. 1 (2011): 3-17, Crispin Wright and Martin Davies, "On Epistemic Entitlement," *Proceedings of the Aristotelian Society, Supplementary*, 78 (2004): 167-245, and Michael Williams, "Contextualism, Externalism, and Epistemic Standards," *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition*, 103, No. 1 (2001): 1-23.

begin with a sketch of two cases of reasoning that approximate Humean demonstrative reasoning and Humean probable reasoning respectively.[7]

First, suppose that with the aid of my computer, I'm doing some accounting work for a struggling company. When I reason on the basis of current financial data and judge that *the company is in the red*, it is a presupposition of my reasoning that my computer is functioning properly.[8] Second, suppose that after checking my watch, I shut down my computer and start walking to my car. When I reason on the basis of past experience and judge that *I'll arrive home by 6:00 p.m.*, it is a presupposition of my reasoning that my car will start.[9] In presupposing these things I take for granted that the world is such that my computer is working properly and that my car will start.

But we need to guard against the temptation to over-intellectualize epistemic presuppositions. It's not the case that in presupposing we explicitly consider various possibilities and take for granted only those that appear most plausible or unassailable. That sort of evaluation would not be taking-for-granted but *reasoning* about possibilities which might have some bearing on our subsequent judgments. Instead, the sense of "taking for granted" characteristic of epistemic presuppositions is a *taking-for-granted-without-consideration*.

[7] Ideally, judgments from demonstrative reasoning are made with the full assurance of demonstrative certainty while judgments from probable reasoning are made with the less than full assurance of a probable judgment (T 1.3.11.2; SBN 124).

[8] This approximates Humean demonstrative reasoning insofar as it's a judgment of "proportions in quantity or number" that must be settled by reasoning (T 1.3.1.2; SBN 70). For the sake of simplicity I've used an example that involves objects like computers and account-balances. But we could make the same point with a straightforward mathematical example by noting that it's a presupposition of one's reasoning about numbers, considered as such, that one's brain is functioning properly. So the lessons drawn from the example in this chapter extend to any case of demonstrative reasoning.

[9] This approximates Humean probable reasoning (in particular, "the probability of causes") where we make probable judgments by balancing contrary evidence from past experience: "In [probable reasoning] we commonly take knowingly into consideration the contrariety of past events; we compare the different sides of the contrariety, and carefully weigh the experiments, which we have on each side" (T 1.3.12.7; SBN 133).

We can get a feel for this by examining my arrival-time judgment. I know that I won't reach home by 6:00 p.m. if my car doesn't start. What's more, I know that my car won't start unless there's fuel in its tank and its battery is charged. But when I reach my car I don't explicitly consider any of this. I simply take for granted that when I turn the key the car will start. Of course if you pressed me I'd admit it's possible that the battery is dead or that someone has siphoned all the fuel or even stolen the car. But absent any pressure that forces the explicit consideration of these possibilities, I leave them unconsidered. In leaving them unconsidered while believing I'll arrive home by 6:00 p.m., I'm taking for granted that the world is such that my car is in the parking lot with its battery charged, some fuel in its tank, and that it will start when I turn the key. So as a first pass we can say that a presupposition is something whose truth is taken for granted without consideration.

Hume appeals to this sort of taking-for-granted at several places in the *Treatise*. For instance, regarding the question "*Whether there be body or not?*," Hume remarks, "[t]hat is a point, which we must take for granted in all our reasonings" (T 1.4.2.1; SBN 187, Hume's emphasis). Similarly, with respect to the maxim that "*whatever begins to exist, must have a cause of existence*," Hume says "[t]his is commonly taken for granted in all reasonings, without any proof given or demanded" (T 1.3.3.1; SBN 78-79, Hume's emphasis). Finally, Hume claims that "[a]ll probable arguments are built on the supposition, that there is…conformity betwixt the future and the past…which we take for granted without any proof" (A 14; SBN 651-2, T 1.3.12.8-9; SBN 133-4). Because their truth is taken for granted without consideration, the existence of bodies, the necessity of a cause, and the uniformity of nature are presuppositions of Humean probable reasoning.

I assume all of us will grant that when we reason, at least in normal circumstances, we presuppose by taking-for-granted in the foregoing sense. I suspect we would also confess to sometimes finding ourselves mistaken as a result of something we've mistakenly presupposed. Because their truth is taken for granted, the discovery that a false presupposition has led to a mistaken judgment is marked by *surprise*. For instance, my surprise when a dead-battery prevents my car from starting is the result of something I've *mistakenly* taken for granted. The frustration of my present expectations forces me to explicitly consider my presuppositions and leads to the discovery that one of them is false.

Reflection on similar experiences will get most of us to admit that, for any presupposition of reasoning, there is at least *some* possibility that it's false. But generally speaking, unless we're pressed to consider them by friends and colleagues or frustrated expectations, possibilities that would otherwise undermine the presuppositions of our reasoning remain unconsidered. So following David Lewis (1996) we can say that taking-for-granted-without-consideration also involves *ignoring* something in that "we *ignore* just those possibilities that falsify our presuppositions" (554).[10]

With the help of Lewis's remark we've uncovered the two aspects of "taking for granted" that characterize epistemic presuppositions in general and presuppositions of reasoning in particular. The first is a taking-for-granted-without-consideration that the world is such that what is presupposed is true. Taking this for granted means ignoring any possibility or evidence that is contrary to one's presuppositions. Hence, the second aspect of taking-for-granted is an ignoring of any possibility or evidence that, if explicitly considered, would undermine or

[10] "Say that we *presuppose* proposition *Q* iff we ignore all possibilities in which not-*Q*. To close the circle: we *ignore* just those possibilities that falsify our presuppositions" (Lewis 1996: 554). Lewis goes on to define *proper presupposition* with respect to different contexts, i.e., those contexts where it is proper to presuppose and thus ignore certain possibilities that would otherwise undermine one's claim to know.

diminish assurance for what is presupposed. Thus, a presupposition of reasoning is something whose truth is taken for granted as if one has full evidence in support such that any possibility or evidence to the contrary is ignored.[11]

III. Epistemic Presuppositions and Relevant Evidence

Our next task is to say what *makes* something a presupposition of one's *present* reasoning since not all taking-for-granted and ignoring counts. A helpful first step comes from Crispin Wright's (2011) definition of a presupposition with respect to a "cognitive project":

> A cognitive project is defined by a pair: a question, and something one might competently do in order to answer it. Thus there is a cognitive project associated with the question "What time is it", which one can execute by looking at one's watch…Next, let a *presupposition* of a given cognitive project be any proposition expressing a condition doubt about which would rationally require doubt about the efficacy of a proposed method of executing the project, or the significance of its result. (31)[12]

In other words, something is a presupposition of a cognitive project only if it has some bearing on the execution of that project and its outcome. It follows that to doubt a presupposition of a cognitive project is to cast doubt on its execution and outcomes.

For our restricted purposes, we can say that something is a presupposition of one's present reasoning only if doubting it would cast doubt on that reasoning and any judgment reached by it. Accordingly, that my car will start is not a presupposition of my financial

[11] Note that this doesn't mean we're *certain* of whatever we presuppose. After all, we've admitted that the falsity of any presupposition is at least possible, which means they are less than fully certain. The point here is that to take for granted the truth of a presupposition is to ignore any possibility or evidence that is contrary to it.
[12] With respect to a Humean framework, all types of reasoning, e.g., demonstrative, causal, and probable are cognitive projects distinguishable in terms of their respective questions and the different ways one might competently answer those questions, e.g., by way of demonstration or by balancing contrary evidence.

reasoning because its failure to do so doesn't give me any reason to question my financial judgment. On the other hand, any reason to worry that my computer is malfunctioning is a reason to worry that my financial judgment is mistaken. As such, that my computer is functioning properly is a presupposition of my financial reasoning.

Given this relationship between presuppositions and judgments, any evidence against a presupposition of our present reasoning is evidence that we've presently reached the wrong judgment. Joining this with what we set out in the last section gives us the following definition for a presupposition of one's present reasoning and any judgment reached by it:

> *P* is a presupposition for a reasoner *R* with respect to a judgment *J* just in case (i) *R* takes *P* for granted in judging that *J*, and (ii) evidence against *P* is evidence that *J* is the wrong judgment

So the mark of a presupposition of one's present reasoning is that evidence of its falsity is evidence against any judgment reached by that reasoning. Consequently, two *types* of evidence are relevant with respect to our present reasoning and any judgment reached by it, viz., (i) the evidence explicitly considered in our present reasoning, and (ii) the evidence that has some bearing on the presuppositions of our present reasoning.

Taking these in turn, the evidence explicitly considered when reasoning bears directly on the rightness or wrongness of any judgment reached by that reasoning.[13] We reach the right judgment only if our present reasoning is legitimate, viz., only if we reason from the right

[13] Recall that, because it's possible to arrive at a true judgment in spite of an error and a false judgment in spite of making no error, truth and falsity are not the marks of good and bad reasoning. Rather, legitimacy and illegitimacy distinguish good reasoning from bad reasoning. We reach the right judgment from legitimate reasoning and the wrong judgment from illegitimate reasoning. So strictly speaking, the evidence selected and explicitly considered in our reasoning bears directly on the rightness and wrongness of our judgments rather than their truth and falsity.

evidence and in the right way.[14] If I've selected all and only the relevant financial data and have properly applied demonstrative rules, then my financial reasoning is legitimate and I've rightly judged that *the company is in the red*.[15] On the other hand, we reach the wrong judgment whenever our reasoning is illegitimate, viz., whenever we make an error by either reasoning from the wrong evidence or in the wrong way. If I've made a rule-application error or an evidence selection error, then my financial reasoning is illegitimate and I've wrongly judged that *the company is in the red*.[16] In this way, the evidence we select and explicitly consider is directly relevant to whether we reach the right judgment or the wrong judgment.

Presuppositions of our present reasoning have some bearing on the execution and outcome of that reasoning. Evidence directly relevant to a presupposition bears on whether the world is as we've taken it to be, which has some bearing on whether we've reasoned from the right evidence and in the right way. Consequently, whether our present reasoning is legitimate, and, thus, whether we've reached the right judgment, partially depends on the truth of the presuppositions of our present reasoning.[17] So evidence that bears directly on the truth or falsity of a presupposition of our present reasoning is *relevant* with respect to that reasoning and any judgment reached by it.

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[14] More precisely, we gave the following definition for legitimate reasoning: Reasoning is legitimate only if (i) all and only the relevant evidence is selected, and (ii) rules of reasoning are properly applied such that the selected evidence is appropriately weighed.

[15] We can say something similar for my probable arrival-time judgment. My present aim is to rightly judge my arrival time. For that, I need to select all and only the relevant driving-home experiences and then weigh them appropriately. If I've done so, my arrival-time reasoning is legitimate and I've rightly judged that *I'll arrive home by 6:00 p.m.*

[16] More precisely, we gave the following definition for illegitimate reasoning: Reasoning is illegitimate when the selected evidence (i) excludes relevant evidence, or (ii) includes irrelevant evidence, or (iii) rules of reasoning are misapplied such that the selected evidence is inappropriately weighed.

[17] The next section makes explicit what is left implicit above. In general, whether one reaches a *true* judgment partially depends upon the truth of all the presuppositions of one's reasoning. But in particular, whether one has reached the *right* judgment depends only on a subset of presuppositions that I'll call *relevant presuppositions*, which bear on the legitimacy of one's present reasoning.

However, evidence that is *directly* relevant to our presuppositions is not directly relevant to our judgments. To illustrate, suppose a technician confirms that my computer is functioning properly. While this confirms that a presupposition of my reasoning is true, it doesn't confirm that I've made the right judgment. After all, it's possible I've reached the wrong judgment from an error in reasoning in spite of my computer's faultless performance. Still, the technician's confirmation provides *some* grounds for thinking my reasoning has gone right and that I've reached the right judgment.

On the other hand, a report that my computer is malfunctioning may alert me to a false presupposition of my reasoning. But this doesn't necessarily mean that I've made the wrong judgment.[18] With a bit of luck, it's possible that the malfunction didn't affect my reasoning and that I've reached the right judgment in spite of it. Nevertheless, this report provides some grounds for thinking that something has gone wrong in my reasoning and that I've reached the wrong judgment.[19] In this way, evidence directly relevant to a presupposition of our reasoning bears *indirectly* on the rightness or wrongness of any judgment reached by that reasoning.[20]

Given these two types of relevant evidence it follows that evidence we've made the wrong judgment may be either direct or indirect. Evidence that we've made an error in

[18] As we'll illustrate in the next section, the falsity of *some* presuppositions may well entail that we reach the wrong judgment but, as the example makes clear, it is not true in general that the falsity of a presupposition entails that one reaches the wrong judgment.

[19] We can say something analogous for my arrival-time judgment and others like it. Evidence that my car will start is not, by itself, evidence that my arrival-time judgment is right. Similarly, evidence that my car won't start, e.g., that it doesn't turn over immediately, is not, by itself, evidence that my judgment is wrong. However, there are some cases where *definitive* evidence that a presupposition is false will provide definitive evidence that one's judgment is false. For our purposes the central point is that evidence which bears directly on the truth of presuppositions does not *necessarily* bear directly on the truth of one's judgments.

[20] Notice that this is consistent with the definition of "relevant evidence" given in the last chapter. There we said that relevant evidence is determined by our present aims and actual circumstances. In all cases of reasoning, part of our aim is to get things right, viz., to arrive at the right judgment from legitimate reasoning. Evidence that bears directly on the truth or falsity of a presupposition of our present reasoning is relevant for judging whether we've presently reached the right judgment. So for any judgment reached by our present reasoning, evidence regarding the presuppositions of that reasoning is relevant in the foregoing sense.

reasoning is *direct evidence* that we've made the wrong judgment. I might encounter evidence of this sort when a colleague attempts to verify my results but reaches a different conclusion. Admittedly, this isn't definitive evidence since it's possible that the fault rests with my colleague (or perhaps both of us). Even so, this conflicting result gives me some reason to worry that I've reached the wrong judgment due to an error in reasoning. In the face of direct evidence that I've made the wrong judgment, assurance for my present judgment diminishes.[21]

Indirect evidence that we've made the wrong judgment comes from direct evidence against a presupposition of our reasoning. Suppose a co-worker sees me heading for the door and says, "I hope you're able to get out of the lot—a delivery truck has been blocking the exit all afternoon!" In my arrival-time reasoning I've taken for granted that the exit from the lot is unobstructed. My co-worker's remark exposes this presupposition by calling attention to a contrary possibility that I've ignored. This previously ignored possibility is direct evidence against a presupposition of my arrival-time reasoning, which is indirect evidence that my arrival-time judgment is wrong. In the face of indirect evidence that I've made the wrong judgment, assurance for that judgment diminishes. Thus, the discovery of any evidence that we've made the wrong judgment, whether direct or indirect, diminishes our assurance for that judgment.

A natural next step would be to consider the impact of direct evidence that a presupposition is true. But we now have the pieces in place to show that *only evidence against a presupposition affects our assurance for judgments*. To see this, suppose I receive confirmation that my computer is working properly. This is direct evidence that a presupposition of my reasoning is true. But in my financial reasoning, I've taken this for granted. More precisely,

[21] Again, we can say something similar for probable conclusions like my arrival-time judgment. If I recall that it's Labor Day weekend—a time when traffic is especially heavy—then I have direct evidence that I've made an error in reasoning by failing to consider all and only the relevant evidence.

I've taken for granted that the world is such that my computer is working properly. Then even though it wasn't explicitly *considered* in my reasoning, any evidence in support of this presupposition has nevertheless been *accounted* for in my reasoning. Because it merely confirms what has been taken for granted, direct evidence that a presupposition of my reasoning is true does not afford new, unaccounted for evidence that I've made the right judgment. This is why the technician's confirmation doesn't increase my assurance that *the company is in the red*. It's also why my car's starting doesn't make me even more sure that *I'll arrive home by 6:00 p.m*. Consequently, evidence in support of a presupposition of our reasoning neither increases nor diminishes assurance for any judgment reached by that reasoning. Thus, evidence that a presupposition is true must be neutral with respect to our reasoning and judgments.

On the other hand, in taking for granted that the world is such that my computer is working properly, I've ignored any possibility or evidence to the contrary. An "error-message" flashing across my computer screen is direct evidence that this presupposition is false. Because this possibility has been ignored, it is *unaccounted* for in my financial reasoning. Accordingly, direct evidence that a presupposition of our present reasoning is false affords unaccounted for evidence that we've made the wrong judgment. Any evidence that we've made the wrong judgment diminishes our assurance for that judgment. Hence, only evidence *against* a presupposition of our reasoning makes a difference to our judgments, and that difference must be one of diminishing our assurance for them.

Wright (2011) captures something like this relationship between presuppositions and judgments by saying that "a rational agent cannot apportion *more* confidence in the outcome of a cognitive project [i.e., a judgment] than she has in anything she recognizes as a presupposition of it" (40). For our purposes, the key is that our assurance for any judgment reached by reasoning

is the partial hostage of our assurance for any presupposition of that reasoning. Undergirding Hume's account of inevitable diminishment is the assumption that direct evidence against a presupposition of any present reasoning is always available. In the next section, we'll see why Hume's assumption is right.

IV. Isolating Relevant Presuppositions

Showing that direct evidence against a presupposition of any present reasoning is always available might seem a terrifically simple task. At the outset I said a presupposition of nearly all judgments is that we're free of familiar skeptical scenarios. The conceivability of such scenarios appears to trivially supply direct evidence against a presupposition of any present reasoning. For instance, the possibility of deception by an evil demon would seem to provide at least *some* reason to worry that I've made the wrong financial judgment. If that's right, the account of inevitable diminishment I'm sketching turns out to be a mere repackaging of a familiar Cartesian doubt. But what makes "Of scepticism with regard to reason" especially striking is that neither Hume's account of inevitable diminishment nor his skeptical arguments against reason trade on familiar skeptical worries.

Skeptical scenarios like the existence of an evil demon are on a par with other conceivable but unexperienced events such as the sun's failing to rise. Conceivable but unexperienced events are what I've called "mere possibilities." Mere possibilities concern matters of fact whose occurrence, Hume tells us, must be judged in accordance with past experience (T 1.3.12.8; SBN 133-34). Because past experience includes no positive evidence in support of them, mere possibilities are rightly ignored in our reasonings. As such, familiar

skeptical possibilities carry no evidential weight in Humean reasoning and play no explanatory role in the account of inevitable diminishment.[22]

Where past experience fails to supply any evidence against a presupposition, it is rightly taken for granted in our reasoning. Then to restrict our focus to just those presuppositions that might be wrongly taken for granted, we can say that a presupposition is relevant with respect to a Humean framework only if past experience includes direct evidence against it. More precisely, we can specify a "relevant presupposition" as follows:

> *P* is a relevant presupposition for a reasoner *R* with respect to a judgment *J* just in case (i) *R* takes *P* for granted in judging that *J*, (ii) direct evidence against *P* is indirect evidence that *J* is the wrong judgment, and (iii) *R*'s past experience includes direct evidence against *P*

The restriction imposed by (iii) captures the idea that unless there is direct evidence against a presupposition, then it is rightly taken for granted in our reasoning. Because a survey of past experience yields no positive evidence against the existence of bodies, the necessity of causes, or the uniformity of nature, these possibilities are rightly ignored in our reasonings. In that case, the presuppositions of Humean probable reasoning we noted earlier are rightly taken for granted in our reasonings.[23]

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[22] This is why "proofs" grounded on uniform past experience yield full assurance that, for instance, the sun will rise in spite of the mere possibility that it will not: "proofs, [are] those arguments, which are deriv'd from the relation of cause and effect, and which are entirely free from doubt and uncertainty" (T 1.3.11.2; SBN 124). However, all of this is not to say that, for Hume, mere possibilities are totally irrelevant. In light of the mere possibility that the physical laws might change, we cannot be certain of any matter of fact. So even though we've had uniform experience of things like the sun's rising and unsupported objects falling, we cannot be *certain* that the sun will rise tomorrow or that a die will fall when dropped. By contrast, certainty is the mark of knowledge where one not only has the full assurance of an intuitive or a demonstrative judgment, one also has *certainty* since the falsity of the judgment is inconceivable. Thus, mere possibilities play an important role for Hume in that they establish a boundary between the full assurance of knowledge and the full assurance of a proof which is a matter of fact whose falsity is always conceivable.

[23] Concerning this last point Hume remarks that when apparently similar causes seem to produce contrary effects, "upon exact scrutiny, a contrariety of effects always betrays a contrariety of causes" (T 1.3.12.5; SBN 132). So

Admittedly, whether we reach a *true judgment* partially depends on the truth of *all* the presuppositions of our present reasoning. When I'm delayed by the obstructing delivery truck, my arrival-time judgment turns out to be false due to a false presupposition of my reasoning. But in framing *legitimacy* I said that if we couldn't have reasoned better, then it's not the case that we should have reasoned differently. Similarly, unless there is evidence such that we could have presupposed better, then it's not the case that we should have presupposed differently. If my past experience includes no positive evidence against my presupposition that the exit is unobstructed, then I couldn't have presupposed any better and shouldn't have presupposed differently. Thus, whether we reach the *right judgment* depends only on the truth of a subset of *relevant presuppositions* that bear on the legitimacy of our present reasoning and, thus, on the *rightness* of our judgments.

While isolating relevant presuppositions allows for setting aside many familiar sources of doubt, an essential presupposition of reasoning remains to be considered. In normal circumstances, we simply take for granted that our present reasoning is legitimate. That is, we normally *presuppose* that we're reasoning from the right evidence and in the right way. To presuppose this means ignoring the possibility that we're presently reasoning from the wrong evidence or in the wrong way. Taking these together we can say that, in general, the legitimacy of any present reasoning is presupposed such that the possibility of illegitimacy is ignored.

But this isn't simply a description of what we *do* when reasoning. It's a prescription of what *must* be done if we are to make and accept any judgment on the basis of our present reasoning. If we didn't presuppose the legitimacy of our reasoning, we would be forced to

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apparent violations of the uniformity of nature have been uniformly attributable to the operation of concealed causes, which is to say that past experience includes no positive evidence against the Uniformity Principle. Again, this isn't to say that these presuppositions of Humean probable reasoning are *certain*—their falsity is conceivable and, thus, they are possibly false.

repeated assessments of our selection and handling of evidence. Put differently, explicit consideration of the possibility that we're presently reasoning from the wrong evidence or in the wrong way would undermine our present reasoning and keep us from making any judgment at all.[24] Furthermore, explicit consideration of the possibility that our present reasoning is illegitimate would keep us from accepting or standing pat with respect to any judgment reached by our present reasoning. Thus, to make or accept any judgment on the basis of our present reasoning requires a presupposition of legitimacy.

At this point, a reflective reader might object by pointing out that, for especially important matters, we often engage in extraordinarily careful reasoning in the hopes of avoiding error. In these cases, we often manage to make judgments with a high degree of assurance precisely because the possibility of illegitimacy is explicitly considered. I'm happy to grant that this often occurs (though not as often as one might wish). But when it does, we're trying to *avoid* falling into error rather than reasoning about whether we've presently fallen into error. So what "extraordinarily careful" marks here is that we've spent more time and attention than usual before (finally) taking for granted that we're reasoning legitimately. My point is not that we can't be especially careful in our selection and weighing of evidence. Rather, the point is that to make a judgment we must eventually get on with our reasoning. To do that we must eventually take for granted that we've got the right evidence in front of us and that we're handling it in the right way. So echoing Hume's remark about the existence of body, the legitimacy of our reasoning "is a point, which we must take for granted in all our reasonings" (T 1.4.2.1; SBN 187).

[24] For now, I set aside cases where we're particularly worried about errors, e.g., when taking an exam. Under such circumstances, when we manage to make a judgment we tend to have little or no assurance for that judgment. But this is just another way of saying that the explicit consideration of the possibility that our present reasoning is illegitimate undermines our present reasoning. I touch on this in more detail in the final section.

A moment's reflection, specifically on past errors, shows that legitimacy is also a *relevant* presupposition of any present reasoning. When Hume says that even the best of us "must be conscious of many errors in the past," he is making the uncontroversial point that we have all made, detected, and can recall errors in reasoning (T 1.4.1.1; SBN 180). We've seen that errors in reasoning are not persistent insofar as their detection is sufficient for their correction. Because legitimacy is presupposed, the detection of an error in reasoning is also met with the discovery of a false presupposition of legitimacy. By exposing and overturning a false presupposition of legitimacy, the detection of an error in reasoning works to correct our mistaken judgments.

Because their detection exposes a false presupposition of legitimacy, recollected errors in reasoning supply positive evidence of the *illegitimacy* of any present reasoning. As such, our recollected errors afford direct evidence *against* any present presupposition of legitimacy. Since all of us have made and are able to recall errors in reasoning, direct evidence against a present presupposition of legitimacy is always available. So legitimacy is a relevant presupposition with respect to a Humean framework, which means direct evidence against a presupposition of any present reasoning is always available. It also means that indirect evidence that we've presently made the wrong judgment is always available. Thus, to accept any judgment solely on the basis of our present reasoning is to ignore relevant evidence that we've presently made the wrong judgment.

V. Inevitable Diminishment

From here we can show how recollected errors pave the way for Hume's skeptical arguments against reason and underwrite his account of inevitable diminishment. "Our reason,"

Hume says, "must be consider'd a kind of cause, of which truth is the natural effect" (T 1.4.1.1; SBN 180). However, past experience shows that reasoning is sometimes illegitimate, which means reason sometimes fails to produce its natural effect. When faced with "contrary" experiences of supposed causal relations, Hume claims we must "vary our reasoning" accordingly:

> [A]s 'tis frequently found, that one observation is contrary to another, and that causes and effects follow not in the same order, of which we have had experience, *we are oblig'd to vary our reasoning on account of this uncertainty, and take into consideration the contrariety of events*. (T 1.3.12.4; SBN 131, my emphasis)

This call to vary our reasoning in light of contrary past experience helps to explain the stage-setting for Hume's skeptical arguments against reason.

Normally, when we reason we presuppose the legitimacy of our reasoning. And normally this presupposition remains unconsidered. But Hume's skeptical arguments put us in abnormal circumstances by pressing us to examine the presuppositions of our reasoning. Reflecting on our contrary experiences of reason's effects must leave us uncertain as to whether any present judgment has been reached by legitimate reasoning. In the face of this uncertainty we must *vary our reasoning* and weigh the *contrariety of events* marked by recollected judgments from reason; thus:

> In every judgment, which we can form concerning probability, as well as concerning knowledge, we ought always to correct the first judgment, deriv'd from the nature of the object, by another judgment, deriv'd from the nature of the understanding. (T 1.4.1.5; SBN 181-2)

The "ought" is especially important here and highlights the normative force behind Hume's skeptical arguments.

It is not just that we're able to recall errors in reasoning and might hold ourselves to a higher epistemic or doxastic standard by weighing the evidence from recollected judgments. Rather, to accept or stand pat with respect to a present judgment is to persist in the unexamined presupposition that it has been reached by legitimate reasoning in spite of available evidence to the contrary. It follows that our initial judgments are *provisional* and that a second step of reasoning is needed to account for relevant evidence that is necessarily unaccounted for in an initial step, viz., evidence that bears directly on whether an initial presupposition of legitimacy is true.

I call this second step of reasoning *corrective*, since Hume says it works to "correct and regulate" our initial judgment and "fix its just standard and proportion" (T 1.4.1.5; SBN 181-2). But recognizing that correction is supposed to impact our initial assurance invites a mistaken assumption about how corrective reasoning works. A common interpretive strategy has it that in a corrective step we're reasoning *about* the appropriateness of our initial degree of assurance.[25] Understood in this way, we're asking whether the full assurance of demonstrative certainty is appropriate for a present demonstrative judgment or whether we have the appropriate degree of less than full assurance for a present probable judgment. However, we've shown that any worry about our assurance for judgments reduces to the worry that they've been reached by illegitimate reasoning. Recollected judgments afford the only relevant evidence for reasoning about the legitimacy of our initial reasoning. Hence, the only means for "correcting" an initial judgment is through the selection and balancing of the evidence afforded by recollected judgments.

[25] For instance, see Garrett (1997), Lynch (1996), and Karlsson (1990)

Indeed, Hume tells us that to marshal the evidence for corrective reasoning we must "enlarge our view to comprehend a kind of history of all the instances, wherein our understanding has deceiv'd us, compar'd with those, wherein its testimony was just and true" (T 1.4.1.1; SBN 180). In other words, recollected judgments from legitimate reasoning and recollected judgments from illegitimate reasoning supply the set of contrary evidence that is balanced in a corrective step. The former judgments are direct evidence that our initial reasoning is legitimate. Because legitimacy is presupposed, this evidence has been accounted for in our initial reasoning. On the other hand, the latter judgments are direct evidence that our initial reasoning is illegitimate. Because this possibility has been ignored, the evidence from recollected errors is unaccounted for in our initial reasoning. Consideration of this unaccounted-for evidence fixes a degree of less than full assurance for the relevant presupposition that our initial reasoning is legitimate, which entails less than full assurance that we've reached the right judgment and, thus, our initial assurance inevitably diminishes. Put differently, because legitimacy is presupposed as if we have full evidence in support, our initial assurance can only go down in a corrective step. Fortunately, Hume manages a more succinct description of this:

> [O]bserving from experience, that 'tis sometimes just and sometimes erroneous, I consider [reason] as regulated by contrary principles or causes…and in ballancing these contrary causes, I diminish by a new probability the assurance of my first decision. (T 1.4.1.9; SBN 184-5)[26]

More long-windedly, by establishing a degree of less than full assurance for a relevant presupposition of legitimacy, corrective reasoning yields a "new probability" that inevitably

[26] Here "probability" can be understood in either Hume's second or third sense. On the former reading, the claim is that consideration of another or "new" probability-as-a-superiority-of-evidence and it rival diminishes initial assurance. On the latter reading, the claim is that reasoning from conjecture diminishes initial assurance with a "new," i.e., a second step, that resolves contrariety in a set of contrary evidence.

diminishes our assurance for any judgment from reason.[27] In this way, Hume's skeptical arguments take indirect aim at our judgments from reason by directly targeting a presupposition of legitimacy required for making and accepting them.

From our discussion of Hume's "probability of causes" in chapter one, it's clear that corrective reasoning is a special case of that probable reasoning where we "take knowingly into consideration the contrariety of past events…and carefully weigh the experiments, which we have on each side" (T 1.3.12.7; SBN 133). What makes it a special case is that the contrary experiments are recollected judgments from reason. This is why corrective reasoning is said to yield a judgment "deriv'd from the nature of the understanding" (T 1.4.1.5; SBN 181-2).

In calling for a corrective step, Hume foreshadows something like Wright's claim that assurance for our judgments cannot exceed our assurance for any recognized presupposition of them. Because a corrective judgment concerns a relevant presupposition of any initial reasoning, it works to "correct and regulate" any initial judgment and "fix its just standard and proportion" (T 1.4.1.5; SBN 181-2). We can explain this by saying that a "just standard and proportion" for our judgments is fixed and corrected by establishing a "just standard and proportion" for something presupposed in making them (T 1.4.1.5; SBN 181-2). If corrective reasoning yields anything less than full assurance that our initial reasoning is legitimate—*which it must in light of past errors*—assurance for an initial judgment inevitably diminishes. Thus, Hume's claim of inevitable diminishment is vindicated.

[27] Readers familiar with this section of the *Treatise* will note that the quoted passage is part of Hume's explanation for why we continue to "believe, and think, and reason as usual" in spite of the fact that we "can find no error" in the skeptical arguments. For our purposes this first-person example regarding how diminishment *would go* is especially helpful in exposing how Hume understands inevitable diminishment and the skeptical arguments against reason. Unfortunately, an examination of Hume's explanation for why we carry on more or less as usual in spite of these arguments will have to wait for another time.

VI. Two Unpromising Alternatives

I've taken considerable time arguing that corrective reasoning inevitably diminishes our assurance for judgments because of what we presuppose when making them. Rather than vindicating Hume's claim it might be thought I've paved the way for rejecting it. On the interpretation I've developed it looks like diminishment is inevitable only because assessment of a relevant presupposition is postponed until after an initial judgment is made. Perhaps the lesson here is that we need an alternative procedure for dealing with the evidence from recollected judgments. But as far as I can tell, there are only two alternatives to Hume's procedure and both are unpromising.

The first unpromising alternative is a single-step procedure similar to something mentioned above. The suggestion here is that we should take the evidence from recollected judgments into consideration when making any initial judgment. In other words, we should weigh the evidence from recollected judgments together with our evidence regarding the company's finances. Following this procedure, all relevant evidence is accounted for in a single step, which means a subsequent corrective step is unnecessary.

The most obvious problem with single-step procedure is that recollected judgments are not directly relevant for making judgments about things like a company's financial state. Further, and to repeat what we said before, the inclusion of evidence that our present reasoning is illegitimate would undermine any present reasoning. Still, I don't mean to deny that we sometimes do something like what the single-step procedure suggests. For instance, when taking an exam, a worry about illegitimate reasoning looms large and, yet, we manage to make judgments. But in such cases our conclusions are attended by little or no assurance. That is, we have little or no assurance that we've made the right judgment. This is just another way of

saying that the inclusion of evidence that our present reasoning is illegitimate undermines that reasoning and any judgment reached by it. So if we suppose that the single-step procedure captures what we do when reasoning—or what we ought to do when reasoning—we're granting Hume's skeptical conclusions at the outset.

The second unpromising alternative is a two-step procedure that reverses Hume's proposal. The suggestion here is that any reasoning about things like a company's finances must be preceded by a step where the evidence from recollected judgments is weighed. With an initial step of what might be called "preemptive" corrective reasoning, we establish a "just standard and proportion" for the relevant presupposition that our reasoning is legitimate (T 1.4.1.5; SBN 181-2). Once this evidence has been weighed we can proceed to subsequent steps of reasoning without any need for further corrective reasoning. So it appears that to reverse Hume's procedure is to reject Hume's claim that diminishment is inevitable.

Showing why the reverse procedure is unpromising requires looking more closely at Hume's skeptical arguments against reason.[28] What I'll call the Degeneration Argument targets judgments from demonstrative reasoning and is supposed to show how "all knowledge degenerates into probability" (T 1.4.1.1; SBN 180).[29] We've put enough pieces in place to sketch how this would work on my interpretation. Ideally, demonstrative judgments are made with the full assurance of demonstrative certainty. Because legitimacy is presupposed in any step of reasoning, and because all of us can recall demonstrative errors, assurance for any

[28] It's important to note that what follows is only a sketch of how Hume's arguments unfold. A host of familiar interpretive challenges, including the status of intuitive knowledge, what Hume means by "extinction," and why we continue to reason even though we can find "no error" in the skeptical arguments, would need to be addressed to give a complete account (T 1.4.1.8; SBN 183-4). Nevertheless, if my reading of inevitable diminishment is sustainable, it takes a step toward a complete account by clarifying both the target of Hume's skeptical arguments and the threat they pose to judgments from reason.

[29] I take it we should read this in Hume's third sense of "probability," which gives us the following: any judgment grounded on a comparison of ideas (i.e., all knowledge) degenerates into a judgment reached by resolving the contrariety in a set of on contrary evidence (i.e., probability as reasoning from conjecture).

demonstrative judgment inevitably diminishes in a necessary step of corrective reasoning. So when all of the relevant evidence has been weighed, all demonstrative judgments fall short of certainty. Thus, all demonstrative certainty degenerates into the less than full assurance of a probable judgment.[30]

The ironic victory to be claimed by the reverse-procedure is that it promises to deliver Hume's first skeptical conclusion in one fewer step. Suppose that all reasoning must be preceded by a step of preemptive corrective reasoning. In light of past errors, a step of preemptive corrective reasoning must establish a degree of less than full assurance that our reasoning is legitimate. Less than full assurance that our reasoning is legitimate means that any judgment reached by reasoning must be less than fully certain. In that case, all judgments are merely probable and nothing is certain. So on the reverse-procedure, "all knowledge degenerates into probability" from a single step of preemptive corrective reasoning (T 1.4.1.1; SBN 180).[31]

Satisfied that he has shown how all demonstrative knowledge is subject to degeneration, Hume takes aim at probable judgments (T 1.4.1.4; SBN 181). Here the skeptical argument unfolds in two stages that are clearest when understood as two arguments. The first, which I'll call the Diminishment Argument, makes the case that any judgment from probable reasoning is also subject to correction and diminishment. From there, what I'll call the Extinction Argument aims to show how we're forced to successive steps of correction and diminishment that threaten the extinction of belief (T 1.4.1.6; SBN 183). We'll consider each of these in turn.

[30] I flag "demonstrative certainty" since, at this point, it isn't obvious whether or how what I've said here extends to intuitive certainty, which is secured "without any enquiry or reasoning" (T 1.3.1.2; SBN 70).

[31] Here too I'm happy to admit that we may sometimes do this. In fact, Hume suggests something like this with his remark about mathematicians: "There is no algebraist nor mathematician so expert in his science, as to place entire confidence in any truth immediately upon his discovery of it, or regard it as any thing, but a mere probability" (T 1.4.1.2; SBN 180-1). But notice the point being made here, viz., that taking stock of past errors before or while making a judgment undermines one's assurance for that judgment.

Again, what we've set out above is enough to sketch a fair picture of how the Diminishment Argument would work on my interpretation. Even in the best of circumstances, the balancing of contrary evidence fixes a degree of less than full assurance for any probable judgment (T 1.3.12.7; SBN 133).[32] Because legitimacy is presupposed in any step of probable reasoning, and because all of us can recall errors in probable reasoning, all probable judgments are subject to correction. When we balance a set of contrary evidence in a corrective step, assurance for any probable judgment inevitably diminishes. Thus, all probable judgments are subject to correction and diminishment.

For reasons analogous to what we saw with the Degeneration Argument, the reverse procedure delivers the Diminishment Argument's conclusion in a single step. A preemptive step of corrective reasoning yields less than full assurance that our reasoning is legitimate. As a result, any subsequent probable judgment will be made with something less than its usual degree of less than full assurance. So rather than blocking the skeptical threat, the reverse-procedure concedes the conclusion of the Diminishment Argument at the outset.

Nevertheless, the failure of the reverse procedure to fend off the skeptical challenge provides a key insight into how the Extinction Argument is supposed to work. The reverse-procedure aims to preemptively discharge the evidence that forces a subsequent corrective step. But this is a trick we can't pull off. Corrective reasoning is a special case of probable reasoning. To make and accept any judgment on the basis of probable reasoning requires presupposing the legitimacy of our reasoning. So making and accepting any judgment on the basis of corrective reasoning—preemptive or otherwise—also requires a presupposition of legitimacy. In that case,

[32] For the sake of simplicity I focus only on Hume's probability of causes (T 1.3.12; SBN 129). Though I haven't discussed causal reasoning, i.e., reasoning from uniform past experience, or Hume's account of the probability of chances, what is set out above applies to them for precisely the same reasons (T 1.3.11; SBN 124).

to accept a judgment solely on the basis of our corrective reasoning is to persist in the presupposition that it has been reached by legitimate reasoning. But recollected errors in reasoning are direct evidence against this presupposition. Thus, to accept or stand pat with respect to a judgment reached by corrective reasoning is to ignore relevant evidence.

This realization sparks the Extinction Argument and launches us into *successive* steps of correction and diminishment (T 1.4.1.6; SBN 182-3). If we're to account for all relevant evidence, any step of corrective reasoning—preemptive or otherwise—must be followed by another corrective step. So in addition to diminishing our initial assurance, each step of corrective reasoning prompts a further step of corrective reasoning. As a result, we're forced to successive steps of correction and diminishment that threaten "a total extinction of belief and evidence" (T 1.4.1.6; SBN 182-3).

The upshot is that whether we adopt Hume's procedure or its reverse, we face the same skeptical challenges.[33] I take it Hume adopts the procedure that he does because it reflects the way we normally reason. Normally, we take the legitimacy of our reasoning for granted, and normally this presupposition goes unnoticed. We reason, we accept our conclusions solely on the basis of our reasoning, and then we get on with our lives. But Hume's "Of scepticism with regard to reason" draws out a relevant presupposition of legitimacy by reminding us that past experience includes evidence against it. Once we marshal the evidence from recollected judgments, we're no longer taking legitimacy for granted. Instead, from balancing a set of contrary evidence that bears directly on its truth or falsity, we establish a degree of less than full

[33] Contrasting Hume's procedure with the reverse-procedure calls to mind the distinction Hume makes in the *Enquiry* between "antecedent" and "consequent" skepticism (EHU 12.1-23; SBN 149-59). There are telling similarities between Hume's discussion of consequent skepticism and the skeptical arguments against reason. However, since an exploration of this is beyond the scope of the present paper I merely pause here to bring it to the reader's attention.

assurance for the presupposition that our present reasoning is legitimate. As a result, our assurance for any judgment reached by that reasoning inevitably diminishes.

VII. Answering Two Long-Standing Objections

Though we'll say more about this in the final chapter, seeing how inevitable diminishment is supposed to work helps to answer two long-standing objections to Hume's skeptical arguments against reason. The first tells us that Hume is simply confused in thinking that corrective reasoning might have any impact on our initial judgments. One way to develop this charge is to spotlight correction as a distinct and unrelated step of reasoning. An initial judgment and our assurance for it are secured by reasoning with respect to the evidence we explicitly consider, e.g., a company's financial data. Correction is a distinct step of reasoning where an entirely different set of evidence is weighed, viz., recollected judgments from reason.[34] Because a corrective step has no impact on the initial evidence or our initial reasoning, it stands to reason that it has no bearing on our initial judgment. Robert Fogelin (1985) makes this point by saying that initial judgments cannot be affected by "higher order probability assignments concerning the correctness" of our initial reasoning. (18)[35] Thus, because a second-order step of corrective reasoning has no *bearing* on our first-order initial reasoning, it cannot impact our initial judgment in the way Hume supposes.

[34] For a version of this objection that is handled by my interpretation but not explicitly discussed, see Loeb (2002), pp. 228-29.

[35] In an extended discussion of this objection Fogelin frames the problem in terms of probability assignments and supposes that corrective reasoning aims at delivering judgments about whether an initial judgment or probability has been judged correctly (17-18). Morris (1989) offers what I take to be the standard reply to Fogelin here, viz., that this objection misses Hume's target by misreading "probability" as objective rather than subjective (see pp. 51-52). What I outline above is a general reply to any objection falling under this general heading.

This objection emerges from the familiar interpretive strategy discussed in the last chapter. There we saw that it's common to frame the skeptical arguments as a call to reflect on the fallibility of our faculties.[36] If that's right, then the object of corrective reasoning is not an initial judgment, which is one of reason's effects, but reason itself, i.e., *reason insofar as it's a cause*. To see how this lays the groundwork for the present objection, recall what Hume says about probable reasoning generally:

> 'Tis…necessary, that in all probable reasonings there be something present to the mind, either seen or remember'd; and that from this we infer something connected with it, which is not seen nor remember'd. (T 1.3.6.7; SBN 89-90)

On the suggested reading of correction, what is inferred but "not seen nor remember'd" is *about* reasoning generally, i.e., a judgment about its usual effect. But it's unclear whether or how a judgment about reasoning in general, e.g., *reasoning is usually reliable*, is supposed to "correct" my judgment that, e.g., *the company is in the red*. After all, these are two independent judgments arrived at by reasoning about entirely unrelated questions.

What's more, it would be a mistake to adjust our initial assurance in accordance with a judgment about reasoning in general. Some of our judgments from reason are more resembling than others because some instances of reasoning are simple while others are more complex. For instance, our complex reasonings in calculus only distantly resemble our simplest reasonings in arithmetic. But in making a judgment about reasoning generally, our selection of evidence isn't informed by our initial reasoning or judgment. As a result, the selected evidence isn't restricted to just those recollected judgments that are relevantly similar to an initial judgment. Then to

[36] For interpreters who cast what I've called corrective reasoning as targeting the reliability or fallibility of reason rather than an initial judgment see: Lynch (1996, p. 91), Morris (1989, p. 47), Meeker (2000, p. 224), Fogelin (1985, p. 16), Garrett (1997, p. 228), and Owen (1999, p. 180).

"correct and regulate" initial assurance in accordance with a judgment about reasoning generally would be to proportion an initial judgment to *partially irrelevant* evidence (T 1.4.1.5; SBN 181-82). So where the object of corrective reasoning is taken to be reason insofar as it's a cause, a corrective step cannot—and should not—play any corrective role.

But as Hume describes it, in a corrective step we're reasoning about an *effect* rather than a *cause*. More precisely, the object of our corrective reasoning is not reason itself, but an initial judgment, i.e., one of reason's effects. This is why Hume says that correction is "a new species of probability" where "the nature of our understanding, and *our reasoning from the first probability become our objects*" (T 1.4.1.5; SBN 181-2, my emphasis).[37] That our initial reasoning is the object of corrective reasoning marks an initial judgment as what is "present to mind" in a corrective step. As such, an initial judgment is the *foundation* of our corrective reasoning that informs our selection of evidence and supplies the preliminary assurance for our reasoning. Understood in this way, a corrective step is the *continuation* of our initial reasoning where relevant but as yet unaccounted for evidence is weighed.

Because an initial judgment is the object of our reasoning, the evidence for a corrective step is restricted to a *subset* of recollected judgments that are relevantly *similar* to an initial judgment.[38] Given relevant similarities, the recollected judgments weighed in a corrective step bear directly on the truth of an initial presupposition of legitimacy and, thus, indirectly on whether an initial judgment is right or wrong. Consequently, what is inferred but "not seen nor

[37] I take it that by "new species" Hume means "new source of uncertainty," viz., Hume's first sense of "probability." We've examined this sense of probability regarding chances and causes. Here Hume marks judgments as a source of contrary evidence regarding one particular cause, viz., reason.

[38] Notice that this aligns with the definition of "relevant evidence" given in the second chapter. There we said that relevant evidence is determined by our present aims and circumstances. Given the particular aim of corrective reasoning, only those recollected judgments arrived at in similar circumstances informed by similar aims are relevant in this sense.

remember'd" in a corrective step is *about* an initial judgment rather than reasoning in general. This is why correction is said to fix a degree of assurance that is "greater or less, according to our experience of the veracity or deceitfulness of our understanding, and *according to the simplicity or intricacy of the question*" addressed in our initial reasoning (T 1.4.1.1; SBN 180). So while Hume appeals to distinct steps of reasoning, these steps are nevertheless related. Hence, there is no mystery as to why a step of corrective reasoning has some impact on our initial judgments: *the evidence weighed in a corrective step is relevant with respect to our initial reasoning and any judgment reached by it*.

What the impact of correction is or *must* be is the question raised by the second long-standing objection. D. G. C. MacNabb (1951) clearly states the challenge here by drawing precisely the opposite conclusion from Hume:

> [I]t seems evident to commonsense that the second-order judgement that I am very likely, though not certain, to be correct in some first-order judgement increases rather than diminishes the authority of that first-order judgement. (101)[39]

The idea here is fairly straightforward. Our judgments are right more often than not. Reflecting on this fact would seem to increase confidence in our judgments rather than diminish it. So in cases where the overwhelming majority of the evidence is that our initial reasoning is legitimate, correction would seem to increase our initial assurance or, at the very least, leave it undiminished. If that's right, then Hume is wrong to suppose that diminishment is inevitable.

Don Garrett (1997) develops a response to this objection by reframing Hume's question. The suggestion is that in a corrective step we're asking whether our initial assurance might be

[39] Bennett (2001) puts the worry for Hume rhetorically: "Why should a stage 2 consideration of stage 1 lead to a lowering of the initial probability [i.e., assurance], rather than a raising of it?" (315). For other versions of this objection see: Foeglin (2009) pp. 46-48, Karlsson (1990) pp. 124-27, Lynch (1996) pp. 92-93, and Owen (1999) p. 184.

unwarrantedly high (225). Though we've already shown that framing corrective reasoning as an evaluation of our initial assurance gets Hume wrong, there is another problem with Garrett's line of reply. For the sake of argument, suppose that in a corrective step we're considering the possibility that our initial assurance is too high. Granting that this may well be the case, our initial assurance would plausibly diminish in a corrective step.[40]

While this is one way to explain how assurance *might* be diminished, it does so only on the condition that we ask the right question. As a result, it leaves open the possibility of increasing our initial assurance by asking a different question, e.g., *whether our initial assurance might be too low*. Indeed, Garrett grants that changing the question in this way would seem to result in an increase of our initial assurance. However, he goes on to say that the availability of an increase-procedure doesn't rule out the diminishment-procedure he attributes to Hume:

> [T]hat a second way of reflecting on the fallibility of our faculties would increase (or at least not lessen) our degree of belief in a judgment…does not entail that reason would not lessen our degree of belief when *operating in the way Hume describes*. (228, Garrett's emphasis)

Then supposing correction is a matter of evaluating our initial assurance as Garrett suggests, our initial assurance diminishes only under special conditions. In that case, Hume is mistaken to claim that diminishment is inevitable.

Fortunately, by showing why only evidence against a presupposition of our reasoning makes a difference to our judgments we've shown where the objection and Garrett's reply go wrong. Recollected judgments from legitimate reasoning supply direct evidence that a relevant

[40] For a similar but slightly clearer and more detailed account see Garrett (2006), pp. 161-3. As I said in the last chapter, I think it's a mistake to say assurance for a probable judgment might be unwarrantedly high or low since assurance for probable judgments is fixed mechanistically by the evidence considered. In that case, any issue with the assurance for a judgment stems from an issue with one's selection of evidence.

presupposition of our initial reasoning is true. While this evidence hasn't been explicitly considered, it is taken for granted and, thus, accounted for in any initial reasoning. But in taking legitimacy for granted, the evidence supplied by recollected errors is ignored. Consequently, evidence that a presupposition of legitimacy is false is unaccounted for in any initial reasoning. Thus, because only evidence against a presupposition of legitimacy makes a difference to our judgments, our initial assurance inevitably diminishes in a corrective step.

Working through two final cases helps to reinforce this conclusion by clarifying the nature of the evidence balanced in a corrective step. First, suppose the evidence for corrective reasoning is uniform, including only recollected judgments reached by legitimate reasoning. Though Hume claims such a case is ruled out in practice, it teaches an important lesson. Where the evidence is uniform, corrective reasoning is a special case of *causal reasoning*. In particular, this is a case where we have a proof that our initial reasoning is legitimate, which means we have a proof that we've reached the right judgment. Since there are no contrary possibilities to cancel, preliminary assurance from an initial judgment survives undiminished through a corrective step. So at least in our idealized case, a corrective step leaves our initial assurance intact.

But while initial assurance doesn't diminish in an idealized case, it also cannot *increase*. Any evidence that our initial presupposition of legitimacy is true is evidence that we've reached the right judgment. The "right judgment" is fully proportioned to the relevant evidence with respect to both its content and degree of assurance. So any evidence that a presupposition of legitimacy is true is evidence that an initial judgment is as it should be. Consequently, to have a proof of legitimacy is to have a proof that our initial judgment *should not* be altered in any way. But this is just another way of explaining what we've already shown—*any evidence that a*

presupposition of our reasoning is true must be neutral with respect to any judgment reached by that reasoning.

With our second case, we're granting what Hume claims is always the case, viz., that the evidence for corrective reasoning includes at least one recollected error. Recollected errors in reasoning are evidence that our initial presupposition of legitimacy is false and that we've reached the wrong judgment. In short, they are evidence that we *should have* made a different judgment. Faced with evidence that we should have made a different judgment, assurance for our initial judgment can only go down. Consequently, where the falsity of an initial presupposition of legitimacy is a live possibility, corrective reasoning can only diminish our initial assurance. Because all of us are able to recall past errors in all types of reasoning, the falsity of any presupposition of legitimacy is a live possibility. So, in practice, diminishment is the inevitable result of corrective reasoning and there is no alternative procedure that might work to restore or increase our assurance. That, as Hume goes on to say, must be left to nature (T 1.4.1.12; SBN 186-87).

VIII. Conclusion

The success of Hume's skeptical arguments rests on the claim that assurance for any judgment reached by reasoning inevitably diminishes from the recollection of errors in reasoning. The key to inevitable diminishment is that recollected errors in reasoning are direct evidence against the relevant presupposition that our present reasoning is legitimate. Since only evidence against a presupposition makes a difference to our judgments, assurance for any judgment inevitably diminishes in a corrective step when we "enlarge our view to comprehend a

kind of history of all the instances, wherein our understanding has deceiv'd us, compar'd with those, wherein its testimony was just and true" (T 1.4.1.1; SBN 180).

With the framework we've put in place, we're finally prepared to confront Hume's skeptical arguments against reason. In the next chapter we make a careful examination of the Degeneration Argument, which is supposed to show how "all knowledge degenerates into probability" (T 1.4.1.1; SBN 180). We've seen a sketch of how this conclusion is secured on my interpretation. But in saying that *all* knowledge degenerates Hume seems to endorse an unrestricted conclusion, which means intuitive knowledge must also be a target. While there is general agreement that Hume intends the Degeneration Argument's conclusion to be unrestricted, interpreters are divided over whether the argument successfully extends to intuitions.

Because intuitive judgments are secured without any "enquiry or reasoning," nothing we've said about demonstrative judgments provides any grounds for thinking intuitions might be mistaken in similar ways or for similar reasons (T 1.3.1.2; SBN 70). In that case, what we've said about diminishment facilitated by recollected errors in reasoning doesn't apply to intuitions. But by distinguishing between two types of intuitions, we can show why one type is a victim of degeneration while the other survives. So it turns out that both sides in the disagreement over the fate of intuitive knowledge are at least partially right.

Though the survival of some knowledge looks like an objection to Hume's argument, it actually reveals that the assumption about the argument's unrestricted scope is mistaken. Hume's aim with the Degeneration Argument is not to reveal that everything is uncertain. Rather, the argument purports to show that when we *apply* what we know, the full assurance of knowledge degenerates into the less than full assurance of a probable judgment. So while

intuitions of a certain type survive degeneration, this is no objection to the Degeneration Argument.[41]

[41] I would like to thank Wade Robison for helpful comments on an earlier draft of this chapter.

Chapter 4

The Degeneration of Knowledge in Practice

I. Introduction

Hume's "Of scepticism with regard to reason" opens with what I'll call the "Degeneration Argument," which is supposed to show that "all knowledge degenerates into probability" (T 1.4.1.1; SBN 180).[1] The degeneration of knowledge is claimed to follow from our ability to recall errors. The basic idea here is that recollected errors give us some reason to worry that any present judgment may be mistaken in similar ways and for similar reasons. As such, recollected errors seem to ensure a degree of uncertainty for anything we might claim to know so that all knowledge is vulnerable to degeneration (T 1.4.1.1; SBN 180). However, getting the Degeneration Argument right requires moving beyond its basic idea. In this chapter we'll see *why* a step of corrective reasoning is needed and *how* this step entails the degeneration of knowledge *in practice*.

We've seen that making and accepting any judgment on the basis of reasoning requires presupposing the legitimacy of that reasoning. For any present demonstrative reasoning, most of us will admit that recalling things like rule-application errors (e.g., miscalculations) undermines this presupposition along with our assurance for a present demonstrative judgment. So at least

[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number. As I mentioned in the last chapter, in this context "probability" should be read in Hume's third sense, which gives us the following: any judgment grounded on a comparison of ideas (i.e., *all knowledge*) degenerates into a judgment reached by resolving the contrariety in a set of on contrary evidence (i.e., *probability as reasoning from conjecture*).

with respect to demonstrative knowledge, the Degeneration Argument is compelling (T 1.3.1.5; SBN 71).[2]

However, this admission isn't enough to establish Hume's conclusion. After all, intuitive knowledge doesn't depend on any "enquiry or reasoning" (T 1.3.1.2; SBN 70). So recollected errors in demonstrative reasoning don't give us any reason to worry that a present intuition might be mistaken in similar ways or for similar reasons. But if the errors offered as evidence against demonstrative knowledge fail to motivate doubts about intuitive knowledge, then Hume has overreached in claiming that *all* knowledge is subject to degeneration.

This is a familiar objection to Hume's argument, and it divides interpreters into two camps. On one side are those that find the case against demonstrative knowledge sufficient for motivating doubts about intuitive knowledge. For instance, David Owen (1999) claims that, "once it is admitted that 'none will maintain, that our assurance in a long numeration exceeds probability', the argument gets a foothold, and then Hume can extend it to simpler demonstrations and intuitions" (180).[3] On the other side are philosophers that doubt whether the argument plausibly extends to intuitive knowledge. As Robert Fogelin (1985) puts it, "our grasp of a 'simple proposition concerning numbers' may not involve any calculation at all but, instead,

[2] When I talk of demonstration, demonstrative judgments, and demonstrative knowledge I mean "demonstrations" in the restricted sense Hume employs. Recall that Hume confines the demonstrative sciences to algebra and arithmetic so that, strictly speaking, all demonstrative judgments are mathematical judgments. However, what I say about Hume's restricted class of demonstrative sciences easily extends to any formal system, such as classical logic, where truth-preserving rules of structure and application are deployed. In what follows I note relevant points where what is said regarding Hume's restricted sense extends to a more general conception of demonstration.

[3] See also: Francis W. Dauer, "Hume's Skepticism with Regard to Reason: A Reconsideration," *Hume Studies*, 22 (1996): 211-30, 212-13. Kevin Meeker, *Hume's Radical Scepticism and the Fate of Naturalized Epistemology*, (New York: Palgrave Macmillan, 2013), 31-2. William Edward Morris, "Hume's Scepticism about Reason," *Hume Studies*, 15 (1989): 39-60, 44-5.

an immediate insight…[so,] the fallibility that infects our calculations (and demonstrations) need not touch our intuitive understanding" (15).[4]

In what follows I argue that each side of this disagreement is partly right because both sides mistakenly treat intuitions as a uniform class. By distinguishing what I call (i) "intuitions of ideas" from (ii) "intuitions of objects" we can see why only the latter are subject to degeneration. Intuitions of objects follow from a direct comparison of ideas insofar as they are representations of objects (T 1.2.2.1; SBN 29). All of us can recall mistaken intuitions of objects where, for instance, we judged that two objects resembled with respect to their color and later discovered that they did not. Recalling these errors gives us some reason to worry that any intuition of objects may be mistaken in similar ways and for similar reasons. So intuitions of objects must be less than certain, and thus, are subject to degeneration.

In contrast, intuitions of ideas follow from a comparison of ideas "consider'd as such" (T 1.3.6.6, 2.3.10.2; SBN 89, 448-449). While mistaken intuitions of objects show that our ideas are not always "adequate representations of objects," our ideas are always adequate representations of themselves (T 1.2.2.1; SBN 29).[5] So our mistaken intuitions of objects give us no reason to worry that our intuitions of ideas might be mistaken in similar ways or for similar reasons. Because we can neither discover nor recall a mistaken intuition of ideas, they are immune to degeneration.

[4] See also: Robert J. Fogelin, *Hume's Skeptical Crisis*, (New York: Oxford University Press, 2009), 160-1 fn. 2. Mikael Karlsson, "Epistemic Leaks and Epistemic Meltdowns: A Response to William Morris on Scepticism with Regard to Reason," *Hume Studies*, 26 (1990): 121-30, 124-5.

[5] This is why Hume says ideas that adequately represent objects are the foundation of knowledge: "Wherever ideas are adequate representations of objects, the relations, contradictions and agreements of the ideas are all applicable to the objects; and this we may in general observe to be the foundation of all human knowledge" (T 1.2.2.1; SBN 29). For especially clear expressions of this point see T 1.4.2.7; SBN 190, and T 2.2.6.2; SBN 366-7.

On the interpretation developed here, it is not the case that *all* knowledge degenerates to probability since intuitions of ideas survive. However, this is not an objection to Hume's argument but a clue to explaining why it's run in the first place. Demonstrative knowledge is possible *in principle* because intuitions of ideas are certain. Granting this much, the Degeneration Argument calls on recollected errors to show how, *in practice*, all of our judgments fall short of certainty. The key is that in the Degeneration Argument Hume is concerned with *applications* of knowledge, as the opening line makes clear: "In all demonstrative sciences the rules are certain and infallible; but when we *apply* them, our fallible and uncertain faculties are very apt to depart from them, and fall into error" (T 1.4.1.1; SBN 180, my emphasis).

II. Possible Objects of Knowledge

"By knowledge," Hume says, "I mean the assurance arising from the comparison of ideas" (T 1.3.11.2; SBN 124). The assurance characteristic of knowledge is *certainty*. For Hume, if something is certain then its falsity is inconceivable (T 1.3.7.3; SBN 95). This type of certainty is possible because the objects of knowledge are ideas that stand in constant relations, i.e., relations that change only if the ideas being compared are changed. So in general, knowledge is certainty, and "[a]ll certainty arises from the comparison of ideas, and from the discovery of such relations as are unalterable, so long as the ideas continue the same" (T 1.3.3.2; SBN 79).

In particular, Hume singles out judgments regarding four constant relations which "depending solely upon ideas, can be the objects of knowledge and certainty" (T 1.3.1.2; SBN 70). These are the constant relations of resemblance, contrariety, degrees in quality, and proportions in quantity or number (T 1.3.1.2; SBN 70). Because the first three of these are

"discoverable at first sight," judgments concerning them "fall more properly under the province of intuition than demonstration" (T 1.3.1.2; SBN 70). For sufficiently simple cases, proportions of quantity or number might also be judged intuitively where, e.g., "at one view [we] observe a superiority or inferiority betwixt any numbers, or figures" (T 1.3.1.3; SBN 70). Then provided cases of the simplest sort, all four constant relations may be judged intuitively or, as Hume puts it, "at first sight, without any enquiry or reasoning" (T 1.3.1.2; SBN 70).

Where proportions of quantity and number cannot be "comprehended in an instant," Hume claims "we must settle the proportions with some liberty, or proceed in a more *artificial* manner" (T 1.3.1.3; SBN 70, Hume's emphasis). If our aim is to secure knowledge, settling the proportions with some liberty (by estimating or guessing) is not an option. Alternatively, to proceed in an "artificial manner" is to engage in demonstrative reasoning.

Hume provides frustratingly little detail or description of how he understands demonstrative reasoning. In what is offered he talks of applying "rules" while invoking commonplace examples of mathematicians and accountants going about their work (T 1.4.1.1-3; SBN 180-1). These clues suggest that Hume is concerned to capture the ways in which we actually perform calculations when complexity precludes intuitive judging.[6] To that end, the methods of calculation and rule-application we're taught in arithmetic and algebra courses suffices.

[6] Interpreters like David Owen and Don Garrett have claimed that Humean demonstrations are best understood as chains of intuitions. See: David Owen, *Hume's Reason* (New York: Oxford University Press, 1999), 100-101, and Don Garrett, *Cognition and Commitment in Hume's Philosophy*, (New York: Oxford University Press, 1997), 223. For my part, I see no compelling textual evidence in favor of this reading. As I suggest above, the scant descriptions Hume provides seem to count against it. Though I can't fully argue the point here, a compelling reason against the chains-of-intuitions reading is its practical implausibility. It would take an accountant ages to work through even a relatively simple addition, e.g., 893 + 3,475, by constructing a chain of intuitive links along the lines suggested by Owen. What's more, this procedure would be entirely unfamiliar to an accountant and fails to reflect how a person would actually carry out the work. All of this counts against reading Humean demonstration in the way Owen and Garrett suggest. At any rate, it is perhaps enough for our purposes to note that the question of how we ought to understand Humean demonstrations is at least an open one.

While this description of Humean demonstrative reasoning is admittedly broad and largely suggestive, it offers a starting point for further discussion. As I read Hume, what is "artificial" about the "manner" of demonstrations is twofold. First, all knowledge and certainty arises from a comparison of ideas. But in contrast to intuitions where the target ideas are *directly* compared, the target ideas of a demonstration must be compared *indirectly* through "the interposition of *other* ideas" (T 1.3.7.3; SBN 95, my emphasis). Second, to achieve this indirect comparison of target ideas, demonstrations must be set-up and worked through either in our heads or on paper. More precisely, with demonstrations we follow *rules* for employing intermediary ideas or objects to indirectly demonstrate what we can't directly intuit.

To illustrate, suppose I'm faced with a sufficiently complex addition. Whether I do the calculation in my head or on paper I employ and follow rules of addition. For instance, I start by placing one number over the other so that they are aligned with respect to their units position. From there I add individual columns of numbers from right to left and, unless I'm at the leftmost column, when a result exceeds 10 I carry the value in the tens position over to the next leftmost column.[7]

Hume gestures at this feature of demonstrations with his example of an accountant whose reasoning is aided by "the artificial structure of the accompts" (T 1.4.1.3; SBN 181). The utilization of an artificial structure, whether in the mind or in the external world, allows for tracking applications of demonstrative rules while displaying a process of reasoning to oneself

[7] Obviously one might adopt an alternative procedure. The point here is only that one must adopt *some* proven procedure for carrying out the calculation.

and others (T 1.4.1.1: SBN 180).[8] Given these identifying characteristics of demonstrative reasoning, all demonstrative judgments are what I call "artifice-dependent":

Artifice-Dependent: Indirect determinations of proportions in quantity or number made in accordance with rules for employing and manipulating either intermediary ideas in the mind or intermediary objects in the external world

Then to "settle the proportions" in an "artificial manner" is to secure artifice-dependent judgments by engaging in demonstrative reasoning.

The artificial manner of demonstration is similar to the "oblique manner" in which judgments from probable reasoning are secured on the basis of past experience:

> In [probable] reasoning we commonly take knowingly into consideration the contrariety of past events; we compare the different sides of the contrariety, and carefully weigh the experiments, which we have on each side: Whence we may conclude, that our reasonings of this kind arise not *directly* from the habit, but in an *oblique* manner. (T 1.3.12.7; SBN 133, Hume's emphasis)[9]

Just as the certainty of knowledge may arise directly and immediately from intuition, the less than full assurance of a probable judgment may arise directly from custom and habit: "As the custom depends not upon any deliberation, it operates immediately, without allowing any time for reflection" (T 1.3.12.7; SBN 133).[10] And just as demonstrative judgments follow from an indirect comparison of the target ideas, judgments from probable reasoning follow indirectly

[8] While we are concerned with Hume's restricted use of demonstrative reasoning, this point extends to any formal system, e.g., classical logic, where truth-preserving rules of structure and application are deployed in working through problems or proofs.

[9] Recall that Hume makes a similar remark about matter of fact reasoning in general, and causal reasoning in particular: "Nay we find in some cases, that the reflection produces the belief without the custom; or more properly speaking, that the reflection produces the custom in an *oblique* and *artificial* manner" (T 1.3.8.14; SBN 104-5).

[10] This is what we called "direct reasoning" in the first chapter.

from habit when we knowingly select and balance contrary evidence from past experience (T 1.3.11.2, 1.3.12.7, 1.3.12.19; SBN 124, 133, 137-8).[11] Hence, the mark of a judgment reached by reasoning as opposed to intuition or habit is that it follows from an indirect "*comparison*, and a discovery of those relations, either constant or inconstant, which two or more objects bear to each other" (T 1.3.2.2; SBN 73-4, Hume's emphasis).[12]

So far we have it that the assurance of knowledge is certainty arising "either immediately" from intuition or indirectly "by the interposition of other ideas" as a result of demonstration (T 1.3.7.3; SBN 95). We've also seen that, for Hume, intuitions may target any of the four constant relations while demonstrations target just those proportions of quantity and number that preclude intuitive judging (T 1.3.1.2-3; SBN 70). But there's room for a further distinction.

Hume identifies the "foundation of all human knowledge" as ideas that are "adequate representations of objects" (T 1.2.2.1; SBN 29). When ideas adequately represent objects, "the relations, contradictions and agreements of the ideas are all applicable to the objects" (T 1.2.2.1; SBN 29). Then supposing a comparison of ideas yields knowledge, where the ideas are adequate representations of objects we gain knowledge of the objects as well. This allows for the possibility of securing knowledge either (i) from a comparison of the "ideas, consider'd as such," i.e., the ideas insofar as they are ideas, or (ii) from a comparison of the ideas considered as representations, i.e., the ideas insofar as they are representations of objects.[13] Because the targets of our judgments matter, we need to be clear as to whether we're talking about ideas considered

[11] This is what we called "indirect reasoning" in the first chapter.
[12] I take it this shows that Hume's concern with reasoning in general is with active, indirect reasoning where we consciously and knowingly reason with respect to selected evidence.
[13] See T 1.3.6.6; SBN 89 and T 2.3.10.2; SBN 448-449 for passages where Hume appeals to this distinction.

as such or ideas considered as representations of objects. So we need to distinguish intuitions and demonstrations that concern only ideas from those that concern objects.

Taking intuitive judgments first, those that target ideas considered as such are what I call "intuitions of ideas":

> **Intuition of Ideas**: A direct comparison of target ideas, which yields an immediate judgment that the ideas stand in a constant relation[14]

Suppose I call to mind two ideas of red fire engines. The comparison of these mental objects yields intuitions of ideas such as the following: *the ideas resemble with respect to their color*, *the number of ideas is equal to 2*, and *1 + 1 = 2*. These are intuitions because they are judgments about constant relations that don't require any reasoning. What makes them intuitions of *ideas* is that they rely on and pertain to ideas considered as such, without any application to objects.

By contrast, intuitive judgments that target ideas considered as representations of objects are what I call "intuitions of objects":

> **Intuition of Objects**: A direct comparison of target representations, which yields an immediate judgment that the objects stand in a constant relation[15]

Ideas that are representations of objects are the *lively* ideas produced by present sensation or called to mind by memory.[16] As such, intuitions of objects are of three types depending upon

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[14] I've left what is meant by an *idea considered as such* intentionally broad. While impressions are the lively ideas that are often representations of sensible objects, if we make a judgment about appearances from a comparison of the lively ideas *considered as such*—without application to any object—it is an intuition of ideas. So the present definition is also meant to distinguish *lively ideas (appearances) considered as such* from *lively ideas (impressions) as representations of objects*. For the sake of simplicity, I set these considerations aside in what follows.

[15] Here too I've left what is meant by a *lively idea insofar as it is a representation of an object* intentionally broad. While my examples focus exclusively on sensible objects like fire engines, "object" is meant to include anything an idea might represent. For instance, from a comparison of lively ideas I might immediately judge that *today and last Thursday resemble with respect to temperature*. Even though days are not sensible objects like fire engines, this is an example of an intuition of objects because it is a comparison of ideas insofar as they are representations. For the sake of simplicity I leave these considerations aside in what follows.

[16] See for instance, T 1.1.1.1, 1.1.3.1, 1.3.4.1, 1.3.4.2, 1.3.5.1, 1.3.5.3, 1.3.9.7, 1.3.10.9, 1.3.13.19; SBN 1-2, 8-9, 82-83, 84, 110, 123, 153-4. I avoid using "impressions" here for the reasons cited in footnote 14. The present

whether the lively ideas are produced by present sensation, memory, or some combination of both.

When both objects are present to the senses, intuitions of objects are judgments literally made "at first sight." For instance, when I look across the street and see two red fire engines, I immediately judge that *those fire engines resemble with respect to their color* or that *the number of fire engines is equal to 2*. These are the sorts of intuitions Hume has in mind by saying that "when any objects *resemble* each other, the resemblance will at first strike the eye, or rather the mind" (T 1.3.1.2; SBN 70, Hume's emphasis). When only one of the objects is present to the senses the other is supplied by memory. For instance, if I see a single red fire engine across the street and compare this with a memory of my first car, I immediately judge that *the fire engine and my first car resemble with respect their color*. Finally, when neither object is present to the senses both are supplied by memory. For instance, if I compare a memory of my first car with a memory of my first bike, I immediately judge that *my first car and my first bike resemble with respect to their color*. All of these are examples of intuitions because they are judgments about constant relations that don't require any reasoning. What makes them intuitions of objects is that they concern lively ideas that are representations of either present or remembered objects.

At this point it might be thought that the foregoing distinction extends without alteration to demonstrations as well. After all, some demonstrations concern only ideas whereas others are about objects such as account-balances. But all demonstrations are artifice-dependent. So strictly speaking, no demonstrative judgment follows from a *direct* comparison of the target ideas or the target objects.

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definition is meant to capture judgments regarding external objects (in the broad sense outlined in the previous note) or external existences. While our lively ideas of such objects are impressions, not all impressions are lively ideas of external objects. So to avoid confusion I talk only of lively ideas, representations, and objects.

To preserve the contrast with intuitions of ideas, I'll call demonstrations that target ideas considered as such "pure demonstrations":

> **Pure Demonstration**: An indirect comparison of target ideas through the interposition of intermediary ideas, which yields a mediate (artifice-dependent) judgment that the target ideas stand in a constant relation

Suppose I'm wondering about the sum of 893 and 3,475. To rely on ideas considered as such means following rules for setting-up and working through the calculation in my head. In doing so I employ *intermediary ideas* to indirectly demonstrate that *the target ideas* stand in a constant relation of equality, viz., that *893 + 3,475 is equal to 4,368*. This is an example of a demonstration because it is a judgment of proportion in numbers that requires reasoning. What makes it a *pure* demonstration is that it is an artifice-dependent judgment which relies on and pertains to ideas considered as such, without appeal or application to objects.

To preserve the contrast with intuitions of objects, demonstrations that target or make use of ideas considered as representations of objects are what I call "mixed demonstrations":

> **Mixed Demonstration**: An indirect comparison of target representations through the interposition of either (i) intermediary ideas or (ii) intermediary objects, which yields a mediate (artifice-dependent) judgment that the target objects stand in a constant relation

The distinguishing feature of mixed demonstrative reasoning is that it makes use of or applies to objects.[17] For instance, suppose I see "893 + 3,475" on my tax-form. Recording the sum in the appropriate box requires working through the calculation either in my head or on paper. If I do the calculation in my head, I use *intermediary ideas* to indirectly demonstrate that the *target*

[17] To spell this out a bit more clearly, the definition implies that to rely on intermediary objects just is to indirectly demonstrate something about target objects; hence the "target representations" of the first line in the definition. The reason for this is that if we work through a calculation on paper, even where we start from an idea considered as such, we end up with an indirect comparison of target objects facilitated by intermediary objects.

objects "893 + 3,475" and "4,368" stand in a constant relation of equality i.e., " = ". Alternatively, if I work through the calculation on paper, I use *intermediary objects*, such as marks on a page, to indirectly demonstrate that the *target objects* stand in a constant relation. In either case, these are examples of demonstrations because they are judgments of proportion in numbers that require reasoning. What makes them *mixed demonstrations* is that they are artifice-dependent judgments that make use of or apply to objects.[18]

Thus, there are four distinct types of judgments that, insofar as they concern constant relations, are possible objects of knowledge: (1) intuitions of ideas, (2) intuitions of objects, (3) pure demonstrations, and (4) mixed demonstrations. These distinctions help to clarify the scope of the Degeneration Argument by allowing us to isolate the probabilistic elements that render all demonstrations and all intuitions *of a certain type* susceptible to degeneration.

By "probabilistic element" I mean something required to engage in a type of reasoning or judging that is associated with past errors such that conclusions from that type of reasoning or judging are merely probable by the lights of past experience. More simply, a probabilistic element is a source of uncertainty that is confirmed as such by past errors. For instance, memory and perception are often aids in our making the right judgment. But all of us have made erroneous judgments due to misperception and misremembering. Given our contrary experience, any judgment that depends on perception or memory is merely probable since it may have been reached in error. Insofar as it is a source of contrary evidence in past experience, any type of reasoning or judging that relies on perception or memory is a source of uncertainty. Thus, a

[18] It's important to keep in mind that mixed demonstrations might be about any objects, i.e., lively ideas either seen or remembered. For instance, I might be trying to calculate the total number of fire engines for two different states or the total number of people attending two events, or the number of sick days used by Bill and Ted etc. What matters here is that we're faced with proportions of quantity or number that must be settled by reasoning and that make use of or apply to objects.

probabilistic element marks a type of reasoning or judging as a "probability" in Hume's first sense and, in particular, a *philosophical probability*.[19]

The next section shows how probabilistic elements associated with past errors drive the degeneration of knowledge *in practice*. Where probabilistic elements have some bearing on our demonstrative reasoning, its legitimacy is merely probable. Where probabilistic elements have some bearing on our intuiting, what I'll call its "adequacy" is merely probable. And where adequacy and legitimacy are merely probable, intuitive and demonstrative judgments do not depend "solely upon ideas," and thus, cannot be "the objects of knowledge and certainty" (T 1.3.1.2; SBN 70).

III. Uncertainty in Practice

Taking demonstrations first, to secure the assurance of demonstrative certainty we need to be sure that we haven't made an error in reasoning. In other words, we need to be sure our demonstrative reasoning is *legitimate* such that we've reasoned from the right evidence and in the right way (T 1.3.11.2; SBN 124). In explaining how the Degeneration Argument reaches its conclusion, Hume provides an example of mixed demonstrative reasoning that spotlights four probabilistic elements on which its legitimacy partially depends, viz., perception, artifice, experience, and complexity:

> In accompts of any length or importance, merchants seldom trust to the infallible certainty of numbers for their security; but by *the artificial structure* of the accompts, produce a probability beyond what is deriv'd from *the skill and experience* of the accomptant. For

[19] Recall that a "probability" in Hume's first sense refers to a source of uncertainty. We said a probability is a *philosophical source of uncertainty* just in case the uncertainty is attributable to nature of the evidence such that a judgment proportioned to it reflect its contrary nature.

> that is plainly of itself some degree of probability; tho' uncertain and variable according to *the degrees of his experience* and *length of the accompt*. (T 1.4.1.3; SBN 181, my emphasis)[20]

Because mixed demonstrative reasoning depends on objects, its legitimacy partially depends on the accurate perception of things like marks on a page or account information. And because all demonstrations are artifice-dependent, the legitimacy of all demonstrative reasoning partially depends on facts about:

(1) The use of *artifice*, i.e., "the artificial structure" employed in one's head or on paper

(2) The reasoner's competence, i.e., "the degrees of his experience"

(3) The complexity and difficulty of the problem, i.e., "the length of the accompt"

Past experience confirms demonstrative errors associated with each of these elements. From misperception we have overlooked minus-signs. From slips of the pen we have mistakenly transcribed characters and symbols. From confusion we have selected the wrong evidence and have misapplied demonstrative rules both in our heads and on paper. In short, these particular probabilistic elements are associated with each type of demonstrative error.

Reflection on demonstrative errors exposes three general sources of uncertainty that render all demonstrative judgments susceptible to degeneration *in practice*. Demonstrative reasoning is legitimate only if demonstrative rules are properly applied with respect to the right evidence.[21] The legitimacy of mixed demonstrative reasoning also depends upon the accurate perception of the relevant objects. But for any present case of demonstrative reasoning,

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[20] When Hume says we *produce* a "probability," he is using the term in his second sense, viz., *probability as a superiority of evidence*. The claim is that an artificial structure *plus* an accountant's experience yields a superiority of evidence favoring legitimate reasoning that is greater than that of an accountant's experience alone. Likewise, the accountant's skill and experience provides a variable superiority of evidence favoring legitimate reasoning depending upon the nature of that experience and the complexity of the calculations.

[21] Recall that what "the right evidence" is depends upon our present aims and actual circumstances.

recollected errors confirm that it's merely probable whether (i) the right evidence is selected, (ii) the rules are properly applied, and (iii) the objects are accurately perceived.[22] So by the lights of past experience, the legitimacy of all demonstrative reasoning is merely probable. And this is why Hume says that "demonstration is subject to the controul of probability" (T 1.4.1.5; SBN 181-2).

A type of reasoning or judging is *subject to the control of probability* if, due to a "contrariety of events" in the past, its conclusions prompt us to "vary our reasoning" with a corrective step:

> [A]s 'tis frequently found, that one observation is contrary to another, and that causes and effects follow not in the same order, of which we have had experience, we are oblig'd to vary our reasoning on account of this uncertainty, and take into consideration the contrariety of events. (T 1.3.12.4; SBN 131)

For the purposes of the Degeneration Argument, the crucial point is that past experience shows that our demonstrative reasoning is sometimes legitimate and sometimes not. Fittingly, Hume refers to the contrary evidence given by reflecting on past judgments as "a new species of probability" (T 1.4.1.5; SBN 181-82). Insofar as it's a source of contrary evidence, demonstrative reasoning is a "new"—that is, an as yet unconsidered—*philosophical probability*. As such, any demonstrative conclusion is subject to the control of probable reasoning, which is a procedure for resolving the contrariety in the evidence and Hume's third sense of "probability."

As we've seen, the type of probable reasoning demonstration is subject to the control of is corrective reasoning. Since "[o]ur reason must be consider'd as a kind of cause," recollected

[22] With relatively few adjustments the foregoing points apply equally to a general view of demonstrations that includes formal logic. For instance, to get things "right," proofs must be appropriately set-up, inference rules must be properly applied, and symbols must be accurately perceived. But in light of past errors, whether we've successfully done all of this is merely probable.

demonstrative errors are evidence that any present demonstration may be similarly mistaken (T 1.4.1.1; SBN 180). Then to stand pat with respect to any initial demonstrative judgment is to ignore relevant evidence that it's wrong. Instead, to account for relevant but as yet unconsidered evidence, Hume says "[we] must enlarge our view to comprehend a kind of history of all the instances, wherein our understanding has deceiv'd us, compar'd with those, wherein its testimony was just and true" (T 1.4.1.1; SBN 180). In other words, any initial demonstrative reasoning must continue with a step of corrective reasoning. Once we "vary our reasoning" in this way and "take into consideration the contrariety of events," the assurance of demonstrative certainty degenerates to the less than full assurance of a probable judgment (T 1.3.12.7; SBN 133).

In discharging my duties as an accountant, I secure the assurance of demonstrative certainty that *the company is in the red,* only if I presuppose that I've reasoned legitimately. So long as this presupposition remains unexamined, I retain the full assurance of demonstrative certainty. But when I consider my initial judgment, I recall that I've been mistaken about similar judgments in the past. This reflection confirms that my present presupposition of legitimacy might be false, which means my initial judgment might be wrong. Accounting for this live possibility requires continuing my initial reasoning with a corrective step where my initial judgment informs my selection of contrary evidence and supplies the preliminary assurance for my reasoning. In resolving the contrariety in the evidence, some portion of the preliminary assurance is canceled. This fixes a degree of less than full assurance for the presupposition that my initial demonstrative reasoning is legitimate and, thus, diminishes my assurance that *the company is in the red*.

In this way, *degeneration* is a consequence of presupposing the legitimacy of our reasoning, for we secure the assurance of demonstrative certainty only if we presuppose that our demonstrative reasoning is legitimate. This is why Hume says a corrective step works "to correct and regulate" an initial judgment and "fix its just standard and proportion" (T 1.4.1.5; SBN 181-82). Since we're able to recall errors with respect to both types of demonstrative reasoning, all demonstration is a source of contrary evidence. As such, all demonstration is subject to the control of a *corrective step* whereby all demonstrative knowledge degenerates to probable belief (T 1.4.1.1; SBN 180).

A moment's reflection shows that intuitions of objects are subject to degeneration for analogous reasons. In general, to secure the assurance of intuitive certainty we need to be sure our intuiting is *adequate*, i.e., error-free. In particular, our intuiting of objects is adequate only if the target objects are accurately perceived or remembered, i.e., only if our lively ideas adequately represent the target objects. But reflection on past experience affords countless examples where our intuiting of objects has been mistaken. Objects sometimes *appear* to resemble with respect to their color when they don't actually resemble with respect to their color. Sometimes a single object appears to be two distinct objects because of a reflection in a mirror or window. Likewise, all of us can recall intuitions of objects where misremembering or misperception led to mistaken judgments about even "the most simple question" regarding proportions in number (T 1.4.1.3; SBN 181). For instance, I recently saw the question *1 + 1 = ?* on my nephew's homework and immediately concluded that *1 + 1 = 2*. But when a second glance revealed that the actual question was *-1 + 1 = ?*, I discovered that my intuition was mistaken.

That we can detect and recall these errors gives us reason to worry that any present intuition of objects may be similarly mistaken. Then to stand pat with respect to a present

intuition of objects is to ignore relevant evidence that it is wrong. But the key point for the Degeneration Argument is that, by the lights of past experience, our intuiting of objects is sometimes adequate and sometimes not. Insofar as it's a source of contrary evidence, the intuiting of objects is a philosophical probability. So like the legitimacy of demonstrative reasoning, the adequacy of our intuiting of objects is merely probable. And like all demonstrations, all intuitions of objects are subject to the control of corrective reasoning.

For instance, I secure the assurance of intuitive certainty that *those fire engines resemble with respect to their color* only if I presuppose the adequacy of my intuiting, e.g., that there are two engines and that they are as they appear. But when I reflect on past intuitions of objects, I realize this presupposition might be false and that my present intuition may be mistaken. This realization prompts a corrective step, where my initial intuition informs the selection of contrary evidence and supplies the preliminary assurance for my reasoning.

Resolving the contrariety in the evidence entails that some portion of the preliminary assurance is canceled. This establishes a degree of less than full assurance for the presupposition that my initial intuiting is adequate and diminishes my assurance that *those fire engines resemble with respect to their color*. So while intuitions themselves don't require any reasoning, any intuiting of objects should be followed by a corrective step. Once we "take into consideration the contrariety of events," the assurance of intuitive certainty degenerates to the less than full assurance of a probable judgment (T 1.3.12.7; SBN 133). Since all of us are able to recall a range of mistaken intuitions of objects, the intuiting of objects is a source of contrary evidence. As such, all intuitions of objects are subject to the control of a *corrective step* whereby all intuitive knowledge of objects "degenerates into probability" (T 1.4.1.1; SBN 180).

This is why I've said that interpreters who claim intuitions are subject to degeneration are at least partly right. The Degeneration Argument exploits a dependence on probabilistic elements to show how judgments that are possibly certain are actually merely probable. The legitimacy of all demonstrative reasoning depends upon the probabilistic elements of evidence-selection and rule-application. Similarly, the adequacy of all intuiting of objects depends upon the probabilistic elements of perception and memory. Past errors confirm that demonstrative reasoning and the intuiting of objects are philosophical sources of uncertainty. Accordingly, judgments issuing from them are certain *in principle* but merely probable *in practice*. Thus, because demonstrations and intuitions of objects do not depend "*solely* upon ideas," they cannot be "the objects of knowledge and certainty" (T 1.3.1.2; SBN 70, my emphasis).

However, it's a mistake to think that this paves the way for extending the argument to intuitions of ideas. Intuitions of ideas follow from a direct comparison of ideas considered as such. Our intuiting of ideas is adequate just in case the target ideas are adequate representations of *themselves*, i.e., just in case the ideas are as they appear. Hume marks ideas that are "adequate representations of objects" as the foundation of knowledge precisely because there is no question as to whether ideas are as they appear (T 1.2.2.1; SBN 29).[23] When we call the target ideas to mind we immediately perceive—and can't help but perceive—that they stand or fail to stand in particular constant relations.[24] Because there is no room to detect or even conceive of an error,

[23]Hume echoes this point in the following passage: "[E]very impression, internal and external…whatever other differences we may observe among them, they appear, all of them, in their true colors, as impressions or perceptions…since all actions and sensations of the mind are known to us by consciousness, they must necessarily appear in every particular what they are, and be what they appear. Every thing that enters the mind, being in *reality* a perception, 'tis impossible any thing shou'd to *feeling* appear different. This were to suppose, that even where we are most intimately conscious, we might be mistaken" (T 1.4.2.7; SBN 190, Hume's emphasis).

[24] While ideas may be more or less clear or obscure, their clarity or obscurity is immediately apparent to us: "If its weakness render it obscure, 'tis our business to remedy that defect, as much as possible, by keeping the idea steady and precise; and till we have done so, 'tis in vain to pretend to reasoning and philosophy" (T 1.3.1.7; SBN 72-3). In the simplest cases where the ideas are clear and precise, intuitions of ideas are beyond doubt.

there are no probabilistic elements to drive degeneration. Consequently, our recollected errors *in practice* give us no reason to worry that our intuitions of ideas might be similarly mistaken.

Consider the example of my nephew's homework. Recalling my mistaken intuition of objects gives me no reason to worry that, from misperception, my intuition of ideas that *1 + 1 = 2* is wrong.[25] Likewise, when I mistakenly judge that *those fire engines resemble with respect to their color*, this provides no reason for thinking I'm similarly mistaken in judging that *these two ideas of fire engines resemble with respect to their color.*[26] Experience proves that our ideas are not always adequate representations of objects, but our ideas are *always* adequate representations of *themselves.*[27]

While it's true that we take for granted the adequacy of our intuiting of ideas, past experience doesn't afford any evidence against this presupposition. In that case, it is not a *relevant* presupposition with respect to a Humean framework, which means the adequacy of our intuiting of ideas is rightly taken for granted. Consequently, intuitions of ideas are not subject to the control of a corrective step and, thus, are immune to degeneration. This is why I've said that interpreters who claim intuitions survive degeneration are also partly right. But as we'll see in the next section, the survival of intuitions of ideas is no objection to Hume's argument.

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[25] Fogelin gestures at something similar with his explanation of an error with a simple addition: "We can make errors in adding a long column of numbers without at some point mistakenly believing that, say, 2 + 3 = 7. We know that 2 + 3 = 5 but, distracted, write down the wrong number, or read a number incorrectly." See Fogelin, *Hume's Skeptical Crisis*, 161 fn. 2. We can now make Fogelin's point by saying that recalling mistaken intuitions of objects provides no reason for thinking we might be similarly mistaken about intuitions of ideas.

[26] That is, to conceive of two ideas of red fire engines is to immediately perceive that they are two, i.e., 1 +1 = 2, and that they resemble with respect to their color. What's more, had the ideas been adequate representations of objects such that the fire engines and the question on my nephew's homework had been as they appeared, then my intuitions of objects would have been correct.

[27] This point is made especially clearly in Book II: "The essence and composition of external bodies are so obscure, that we must necessarily, in our reasonings, or rather conjectures concerning them, involve ourselves in contradictions and absurdities. But as the perceptions of the mind *are perfectly known*, and I have us'd all imaginable caution in forming conclusions concerning them, I have always hop'd to keep clear of those contradictions, which have attended every other system" (T 2.2.6.2; SBN 366-7, my emphasis).

IV. The Degeneration of Knowledge in Practice

The survival of intuitions of ideas is an objection to the Degeneration Argument only if we assume that the argument is meant to reduce everything to uncertainty. But in the opening line, Hume shows this assumption is mistaken by granting that demonstrative rules "are *certain and infallible*" and admitting the "*infallible certainty* of numbers" (T 1.4.1.1, 1.4.1.3; SBN 180-1, my emphasis). Intuitions of ideas account for our certainty about the infallibility of numbers and underwrite the "precise standard" that grounds the possibility of demonstrative knowledge:

> [A]lgebra and arithmetic [are] the only sciences, in which we can carry on *a chain of reasoning* to any degree of intricacy, and yet *preserve a perfect exactness and certainty*. We are possest of a *precise standard*, by which we can judge of the equality and proportion of numbers…When two numbers are so combin'd, as that the one has always an unite answering to every unite of the other, we pronounce them equal. (T 1.3.1.5; SBN 71, my emphasis)

From intuitions of ideas such as *1 + 1 = 2*, we *know* that when numbers can be put into one-to-one correspondence they are equal, "and according as [the proportions] correspond or not to that standard, we determine their relations, *without the possibility of error*" (T 1.3.1.5; SBN 71, my emphasis).[28] This is why *legitimate* demonstrations, guided by "certain and infallible" rules, work to "preserve a perfect exactness and certainty" and yield artifice-dependent judgments that conform to a precise standard (T 1.4.1.1, 1.1.3.5; SBN 180, 71).

[28] Again, a similar point holds for other formal systems that might be included in a general description of the demonstrative sciences where the foundations of a precise standard remain beyond doubt, e.g., excluded middle and non-contradiction, while judgments supposedly made in accordance with that standard are less than certain.

But if intuitions of ideas were uncertain, there would be no precise standard, no "exactness and certainty" to *preserve,* and thus, no possibility of demonstrative knowledge. In that case the Degeneration Argument—which calls on recollected *errors* to undermine certainty—would be superfluous. Hume could straightforwardly rule out demonstrative knowledge by denying the existence of "a precise standard" for judging "the equality and proportion of numbers" (T 1.3.1.5; SBN 71). What's more, this line of argument was already pursued when Hume declared that "'tis for want of such a [precise] standard of equality in *extension*, that geometry can scarce be esteem'd a perfect and infallible science" (T 1.3.1.5; SBN 71, my emphasis).

But this is not the line Hume pursues with respect to the demonstrative sciences. Intuitions of ideas not only ground the possibility of demonstrative knowledge *in principle,* they also supply a background against which demonstrative errors are detectable *in practice*.[29] By accepting a restricted class of known propositions in the opening line of the argument, Hume grants the possibility of demonstrative knowledge in principle. Calling on recollected errors, the aim of the Degeneration Argument is to show that, in practice, we never secure certainty from *applying* what we know. This is made clear when Hume contrasts the infallibility of demonstrative rules with our fallible applications of them:

> In all demonstrative sciences the rules are certain and infallible; but when we *apply* them, our fallible and uncertain faculties are very apt to depart from them, and fall into error. (T 1.4.1.1; SBN 180, my emphasis)

The claim is not that *every* proposition falls short of certainty, but rather that we sometimes make errors in spite of what we know. That we are able to detect and recall these errors gives us

[29] After all, if I wasn't certain that 1 + 1 = 2, I couldn't be sure I'd made an error on my nephew's homework or the company's accounts.

reason to worry that relevantly similar judgments may be mistaken in similar ways and for similar reasons. So while intuitions of ideas are certain, all demonstrations and intuitions of objects are uncertain by the lights of past experience. Thus, with a slight emendation the Degeneration Argument shows how, *in practice*, "all knowledge degenerates into probability" (T 1.4.1.1; SBN 180).

Understood in this way, the Degeneration Argument echoes Hume's conclusion about geometry. While geometry is excluded from the demonstrative sciences, this is not because everything in geometry is necessarily uncertain. In fact, just before reminding us that geometry "can scarce be esteem'd a perfect and infallible science," Hume cites examples of possibly certain intuitions about "figures" and "very limited portions of extension; which are comprehended in an instant" (T 1.3.1.5, 1.3.1.3; SBN 71, 70). These remarks suggest that, with the appropriate qualifications, judgments in geometry are at least *possibly* certain.

We can make sense of this in light of Hume's appeal to an imprecise standard for judgments in geometry that, while "deriv'd from a comparison of objects, upon their general appearance," is nevertheless secured by "first principles…[that are] certain and infallible" (T 1.2.4.31; SBN 638).[30] As with the opening line of the Degeneration Argument, I take it when Hume refers to "first principles" he is appealing to intuitions of ideas. Intuitions of ideas in geometry are beyond doubt for the same reason that all intuitions of ideas are beyond doubt, viz., the target ideas are as they appear. Supposing a comparison of ideas yields knowledge, if the ideas are adequate representations of objects we gain knowledge of the objects as well:

[30] For a helpful discussion of Hume's "precise" and "imprecise" standards with respect to geometry see Emil Badici, "On the Compatibility between Euclidean Geometry and Hume's Denial of Infinite Divisibility," *Hume Studies* 34 (2008): 231-244, especially 235-39. While Badici is willing to draw more far reaching conclusions on the basis of Hume's imprecise standard than I am, the discussion convincingly makes the point argued for above, i.e., that judgments in geometry are not *necessarily* uncertain.

> [T]he eye, or rather *the mind is often able at one view* to determine the proportions of bodies, and pronounce them equal to, or greater or less than each other, without examining or comparing the numbers of their minute parts. Such judgments are not only common, but in many cases *certain and infallible*. When the measure of a yard and that of a foot are presented, *the mind can no more question*, that the first is longer than the second, than it can doubt of those principles, which are the most clear and self-evident. (T 1.2.4.22; SBN 637, my emphasis)

Then within certain bounds, i.e., when they conform to a standard secured by general appearances, our intuitions of objects are certain even in geometry.

But as we've seen, intuitions of objects are sometimes mistaken, which means we can never be certain that they conform to even an imprecise standard. Past experience shows that, even in the simplest of cases, our lively ideas are not always adequate representations of objects. For our judgments in geometry, Hume makes this point especially clear by describing how we often discover and attempt to "correct" our mistaken intuitions of objects:

> '[T]ho…decisions concerning these proportions be sometimes infallible, they are not always so; nor are our judgments of this kind more exempt from doubt and error, than those on any other subject. We frequently correct our first opinion by a review and reflection; and pronounce *those objects to be equal*, which at first we esteem'd unequal…Nor is this the only correction, which *these judgments of the senses* undergo; but we often discover our error by a juxta-position of the objects…[or] by the use of some common and invariable measure. (T 1.2.4.23; SBN 47, my emphasis)

This passage calls to mind the reasoning of the Degeneration Argument. In practice, we have made, detected, and are able to recall mistaken intuitions of objects. So by the lights of past

experience, the adequacy of our intuiting of objects for the purposes of geometry is uncertain. Thus, *in practice*, all judgments in geometry fall short of certainty.

But the uncertainty of our judgments is not the reason Hume cites for excluding geometry from the demonstrative sciences. Hume restricts the demonstrative sciences to those fields where we can "carry on a chain of reasoning…and yet preserve a perfect exactness and certainty" (T 1.3.1.5; SBN 71). Chains of reasoning that *preserve* certainty are possible because we are "possest of a *precise* standard of equality, by which we can judge of the equality and proportion of numbers" (T 1.3.1.5; SBN 71, my emphasis).

While we know that "lines or surfaces are equal, when the numbers of points in each are equal," we can neither perceive nor count the points of a line (T 1.2.4.19; SBN 45). Then even though we cannot doubt intuitions of ideas based on general appearances, e.g., *these ideas of lines are equal with respect to their length*, we can never know whether two lines are equal with respect to the number of their points.[31] It is in this sense that a precise standard of equality in extension "tho'… *just*, as well as obvious…is entirely useless" (T 1.2.4.19; SBN 45).[32] However, Hume is not suggesting that all judgments in geometry are *in principle* uncertain. It is just that the intricate chains of reasoning needed to secure the "subtile inferences" claimed by geometers requires a precise standard that is useless in practice (T 1.2.4.31; SBN 638). Thus, "'tis for want of such a [precise] standard of equality in extension, that geometry can scarce be esteem'd a perfect and infallible science. (T 1.3.1.5; SBN 71)

[31] Hume's discussion of abstract ideas is instructive on this point where length is treated as a quality rather than a quantity: "'tis evident *at first sight*, that the precise length of a line is not different nor distinguishable from the line itself; nor the precise degree of *any quality* from the quality" (T 1.1.7.3; SBN 18-19, my emphasis).

[32] "For as the points, which enter into the composition of any line or surface, whether perceiv'd by the sight or touch, are so minute and so confounded with each other, that 'tis utterly impossible for the mind to compute their number, such a computation will never afford us a standard, by which we may judge of proportions. No one will ever be able to determine by an exact numeration, that an inch has fewer points than a foot" (T 1.2.4.19; SBN 45).

Unlike extensions, the objects of the demonstrative sciences do not preclude the possibility of judging in conformity with a precise standard. This is why Hume is unable to claim that judgments in algebra and arithmetic are uncertain in principle. It's also why Hume calls on past errors in reasoning to show that, in practice, demonstrative judgments must be less than certain. Reflecting on past errors undermines any present presupposition of legitimacy so that we can never be sure that our demonstrative judgments conform to a precise standard. In that case, all demonstrative judgments fall short of certainty. Hence, while reached by a different route, the Degeneration Argument echoes Hume's conclusion about geometry by showing that a precise standard for judging the equality and proportion of numbers is *useless in practice* for securing knowledge.

V. "Simple Additions" and the Degeneration of "All" Knowledge

I've argued that the scope of the Degeneration Argument is not actually unrestricted and that Hume does not intend it to be so. By granting a restricted class of known proposition at the outset, Hume signals that at least some knowledge is safe from degeneration. But regardless of where they stand on the question of intuitions, this conclusion is not likely to sit well with interpreters. While there is disagreement over the Degeneration Argument's actual scope, there is widespread agreement that Hume intended it to be unrestricted and that intuitions are a target.

The evidence usually put forward to show that intuitions are supposed to be subject to degeneration comes from Hume's remarks about the "addition of two single numbers":

> Now as none will maintain, that our assurance in a long numeration exceeds probability, I may safely affirm, that there scarce is any proposition concerning numbers, of which we can have fuller security. For 'tis easily possible, by gradually diminishing the numbers, to

> reduce the longest series of addition to the most simple question, which can be form'd, to an addition of two single numbers…[but] if any single addition were certain, every one wou'd be so, and consequently the whole or total sum. (T 1.4.1.3; SBN 181)

What Hume means by "diminishing the numbers" and "the most simple question" is open to interpretation. However, what is most significant for our purposes is that Hume appeals to the activity of *adding* "two single numbers." This speaks against reading the passage as an attempt to extend the Degeneration Argument to intuitive judgments. After all, intuitive judgments are made "at first sight, without any enquiry or reasoning" (T 1.3.1.2; SBN 70). On a more natural reading of the passage, Hume is simply pointing out that even the simplest *demonstrations* fall short of certainty.

Nevertheless, Hume twice describes the conclusion of the Degeneration Argument as extending to "all knowledge" (T 1.4.1.1, 1.4.1.4; SBN 180, 181). On its face, this looks like an endorsement of the unrestricted reading. But we need to keep in mind that the Degeneration Argument appears in "Of scepticism with regard to reason." The arguments Hume presents in this section of the *Treatise* take explicit aim at the products of *reason*. Given this context, "all" should be read with restricted quantification. So when Hume says "all knowledge degenerates" he is referring only to knowledge reached by *demonstrative reasoning*. Significantly, before turning to the argument against probable reason Hume appears to endorse this reading when he claims to have shown only that "*demonstration* is subject to the controul of probability" (T 1.4.1.5; SBN 181-2, my emphasis).

In light of the above considerations, we have good reason for thinking that the scope of the Degeneration Argument is restricted and that intuitions are not a target. But even if I'm right about all of this, given how the Degeneration Argument works the status of intuitions is an open

question that interpreters are right to try to answer. I've shown that intuitions of objects are subject to degeneration for reasons analogous to those provided against demonstrative knowledge. When interpreters attempt to show that the argument extends to intuitions generally, their examples focus on intuitions of this type. For instance, Don Garrett (1997) says that, for Hume, "failures of memory or retention *are* failures in adding two single numbers (224, Garrett's emphasis)." Similarly, William Morris (1989) invokes an imbalanced checkbook as evidence that intuitions in general are sometimes mistaken (44-45).

While I think it's a mistake to understand simple additions as intuitions, I'll set this aside for the sake of argument. Even so, any error regarding simple additions is an error *in practice*. Then insofar as the cases offered by Garrett and Morris concern intuitions at all, they concern only intuitions of objects.[33] At best they are examples which show that, even for "the most simple question" of proportion in number, our intuitions of objects might be mistaken (T 1.4.1.3; SBN 181). More precisely, they offer further confirmation that, in practice, when engaged in activities like balancing checkbooks (if such a thing is done anymore) we sometimes *misapply* what we know.[34] But these errors in practice give us no reason to doubt our intuitions of ideas. So even if we grant that "simple additions" might be read as "intuitions," this fails to show that the Degeneration Argument extends to intuitions generally.

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[33] Actually, I don't think Garrett's example plausibly captures a Humean intuition in any sense. Garrett supposes that we might make an error with respect to the intuitive steps that make up a demonstration (see: *Cognition and Commitment in Hume's Philosophy*, 223). I've given some reasons against interpreting Humean demonstrations as chains of intuitions. But suppose one finds my suggestion unconvincing and favors something like Garrett's approach. Nevertheless, an intuition *considered as such* isn't necessarily mistaken even when the intuition *insofar as it is a step in a demonstration* constitutes a demonstrative error. For instance, applying the intuitive judgment that *2 + 2 = 4* when what is required for that particular step is *2 + 1 = 3*. Here the intuition is correct but produces an error in demonstrative reasoning when applied at an inappropriate step in that reasoning. In any case, examples like those given by Garrett and Morris provide no grounds for thinking we sometimes get intuitions of ideas wrong even if we're able to understand them as examples of erroneous intuitions of objects.

[34] Put differently, we sometimes apply our knowledge that *1 + 1 = 2* in contexts where we're actually faced with *-1 + 1 = ?*.

This last remark is related to a salient interpretive issue that, as far as I know, has yet to be addressed. For the sake of illustration, suppose that we might be mistaken about intuitions of *ideas* regarding the simplest proportions in number. The dispute over the scope of the Degeneration Argument suggests that this would settle the matter: if such intuitions are uncertain, then *nothing* is certain. But this is a mistake. Even if we admit that all intuitions regarding proportions of number might be uncertain, this wouldn't provide any reason for questioning our intuitions of ideas about the other *three* constant relations, viz., resemblance, contrariety, and degrees in quality (T 1.3.1.2; SBN 70). In other words, to show that knowledge unrestrictedly degenerates into probability, we need an argument that shows intuitions of ideas regarding *all four constant relations* are uncertain. That Hume fails to present such an argument is further evidence that the Degeneration Argument targets only those judgments reached by demonstrative reasoning.

VI. Conclusion

Hume grants that knowledge is possible from both intuition and demonstration. What's more, until he reaches "Of scepticisim with regard to reason," he allows for the possibility of securing intuitive knowledge about objects from comparisons of ideas that are adequate representations of them. But with the Degeneration Argument, Hume appears to deny that we can ever be certain of anything since "all knowledge degenerates into probability" (T 1.4.1.1; SBN 180). While interpreters have remained divided over whether the Degeneration Argument extends to intuitions, we've shown that both sides are partly right because both sides mistakenly treat intuitions as a uniform class.

By distinguishing intuitions of ideas from intuitions of objects we're able to show why only the latter are subject to degeneration. The Degeneration Argument calls on recollected errors to show how judgments that are certain in principle are merely probable in practice. We're able to detect and recall mistaken intuitions of objects because our ideas are not always adequate representations of objects. Reflecting on past errors gives us reason to worry that any present intuition of objects might be mistaken in similar ways and for similar reasons. But we could never detect or recall a mistaken intuition of ideas because our ideas are always adequate representations of themselves. Consequently, only intuitions of objects are subject to degeneration.

But this is no objection to Hume's argument since he grants this exception to degeneration at the outset by admitting a restricted class of known propositions in the opening line. Intuitions of ideas ground the possibility of demonstrative knowledge. And it is because intuitions of ideas are beyond doubt that Hume relies on recollected errors to run the Degeneration Argument. Past errors confirm that, like chances and causes, demonstrations and intuitions of objects are philosophical sources of uncertainty, i.e., they are "probabilities" in Hume's first sense. As such, they are subject to the control of a corrective step that inevitably diminishes our assurance for any conclusion reached by them. Thus, in appealing to recollected errors, the Degeneration Argument shows that, in practice, all of our judgments fall short of certainty in spite of what we know.

While accepting a restricted class of known propositions may seem a bit of a watering-down of Hume's skeptical conclusion, the concession is a minor one. Supposing the interpretation developed in this chapter is right, Hume grants that we have knowledge only from intuitions of ideas and only until we try to do something with it. While we cannot doubt that two

ideas resemble with respect to their color or that *1 + 1 = 2*, in light of past errors we can never be *certain* that, e.g., two objects resemble with respect to their color. The appearances of our ideas is something we cannot question, but whether they are "adequate representations of objects" is something we can never know (T 1.2.2.1; SBN 29).

With the argument against demonstrative reasoning in hand, we're ready to face the complicated and controversial argument against probable reasoning. In the next chapter we'll see how this argument unfolds in two stages. The first stage purports to show that all probable judgments are also subject to correction and diminishment. From there, the second stage claims to show that accounting for *all* relevant evidence requires *successive* steps of correction and diminishment. Taken together, these two stages are supposed to usher in Hume's infamous conclusion of a "total extinction of belief and evidence" (T 1.4.1.6; SBN 182-83). Ultimately, we'll see how Hume's skeptical arguments expose *reasoning in general* as a philosophical source of uncertainty. This paves the way for the extinction of knowledge and belief by showing that any judgment reached by reasoning is subject to the control of correction and diminishment.[35]

[35] I'm grateful to Aaron Garret and Maité Cruz Tleugabulova for helpful discussions of an earlier draft of this chapter. I presented a very condensed and very early draft of this chapter at the 43rd International Hume Conference and I would like to thank all those who participated for their helpful discussion, especially David Owen who provided an excellent and thoughtful commentary on the paper.

Chapter 5

The Diminishment of Belief and the Extinction of Evidence

I. Introduction

All things considered, the Degeneration Argument has fared pretty well. This is partly because philosophers are familiar with the charge that we might not know much of anything or, indeed, anything at all. But the main reason for the Degeneration Argument's warm reception has to do with what comes after it. Turning to an examination of the merely probable, Hume proceeds to argue that reasoning as we should ushers in "a total extinction of belief and evidence" (T 1.4.1.6; SBN 183).[1] The argument for this striking conclusion has earned most of the attention paid to "Of scepticism with regard to reason." But in spite of this attention, the procedure of corrective reasoning that drives both degeneration and extinction hasn't been fully understood. As a result, why Hume thinks the extinction of belief and evidence follows from reasoning as we should has remained mysterious.

The aim of the present chapter is to show how Hume reaches this infamous conclusion in two distinct stages. For the sake of clarity, I treat these two stages as two distinct arguments. The first is what I'll call the Diminishment Argument, which targets familiar judgments reached by probable reasoning. We've seen how explicit consideration of the possibility that our present reasoning is illegitimate would undermine our reasoning and keep us from making any judgment.

[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number.

So to make and accept a judgment solely on the basis of probable reasoning, we must presuppose the legitimacy of our reasoning. However, reflection on past experience confirms that our probable reasoning is sometimes legitimate and sometimes not. In light of this contrary evidence, the legitimacy of *all* probable reasoning is itself *merely probable*. Consequently, all probable judgments are subject to correction and diminishment (T 1.4.1.5; SBN 182).[2]

From there we turn to what I'll call the Extinction Argument, which targets corrected judgments in general. Because corrective reasoning is a special case of probable reasoning, the legitimacy of our reasoning in any corrective step is merely probable. Consequently, all corrected judgments are themselves subject to correction and diminishment. As a result, our initial reasoning must continue with successive steps of correction and diminishment "till at last there remain nothing" of our initial assurance, "however great we may suppose it to have been, and however small the diminution by every new uncertainty" (T 1.4.1.6; SBN 182). Thus, reasoning as we should and accounting for *all* relevant evidence ushers in Hume's infamous conclusion of "a total extinction of belief and evidence" (T 1.4.1.6; SBN 183).

Clearly displaying how the Extinction Argument delivers this conclusion illuminates Hume's general strategy for the arguments in "Of scepticism with regard to reason." In general, we have reasoned as we should just in case our judgments are fully proportioned to all and only the relevant evidence. To accept any judgment solely on the basis of our present reasoning is to presuppose that it has been reached by legitimate reasoning. But when we reflect on past judgments, we discover a "contrariety of events" that marks *all reasoning* as a philosophical source of uncertainty (T 1.3.12.4; SBN 131). As such, *all* judgments from reason are subject to

[2] As I make clear in the next section, while Hume's express concern is with probable judgments, causal judgments are implicated as well.

correction and diminishment. Thus, the extinction of knowledge and belief follows from the seemingly benign admission that we're able to recall past errors in reasoning.

On my reading, recollected errors ensure that each corrective step introduces additional contrary evidence. The continual addition of contrary evidence continually undermines the evidential grounds for any initial judgment and eventually diminishes our initial assurance to nothing. Understood in this way, a total diminution of assurance follows from the total erosion of evidential grounds. This reading is at odds with an influential interpretation defended by philosophers such as David Owen (1999). In the closing section I defend my controversial reading by showing where Owen's argument, and others like it, misunderstand Hume by mischaracterizing corrective reasoning.

II. Making an Initial Probable Judgment

Broadly speaking, Hume's "Of scepticism with regard to reason" tells us that proportioning our beliefs to all relevant evidence requires at least two steps of reasoning to account for two bodies of relevant evidence. In an initial step, the evidence we select and explicitly consider bears directly on whether our initial judgment is right or wrong. In a corrective step, recalling relevantly similar judgments supplies the contrary evidence for our reasoning. These recollected judgments bear directly on whether an initial presupposition of legitimacy is true or false and, thus, indirectly on whether an initial judgment is right or wrong. Balancing this evidence fixes a degree of less than full assurance for an initial presupposition of legitimacy, thereby diminishing our assurance for any initial judgment. Thus, to account for all relevant evidence our initial reasoning must continue with a corrective step that inevitably diminishes our initial assurance.

Utilizing this framework, the Degeneration Argument calls on past errors to show that demonstrative reasoning is a philosophical source of uncertainty. As such, all demonstrations are subject to the control of a corrective step so that, in practice, all demonstrations are less than certain. With the Diminishment Argument, Hume's attention shifts to judgments reached by probable reasoning. To set the stage for this argument, we'll briefly revisit Hume's account of single-event probable reasoning. However, what we say in this chapter applies to matter of fact reasoning generally. So even where judgments reached by causal reasoning are not explicitly mentioned, what follows extends to them as well.

The necessary foundation for reasoning about matters of fact is a present impression of sensation or memory that informs our selection of evidence and supplies the preliminary assurance for our reasoning (T 1.3.4.2, 1.3.6.2; SBN 83, 87). Depending upon our present aims and circumstances, we select a set of relevant evidence from past experience (T 1.3.6.2, 1.3.12.8; SBN 87, 134).[3] Our causal judgments are grounded on sets of uniform evidence where the live possibilities are all of the same type.[4] In contrast, our probable judgments are grounded on sets of non-uniform evidence that include live possibilities of contrary types.

[3] To reinforce these last two points, recall the following: "Tho' the mind in its reasonings from causes or effects carries its view beyond those objects, which it sees or remembers, it must never lose sight of them entirely, nor reason merely upon its own ideas, without some mixture of impressions, or at least of ideas of the memory, which are equivalent to impressions" (T 1.3.4.1; SBN 82). "'Tis merely the force and liveliness of the perception, which constitutes the first act of the judgment, and lays the foundation of that reasoning, which we build upon it, when we trace the relation of cause and effect" (T 1.3.5.7; SBN 86). "In all those instances, from which we learn the conjunction of particular causes and effects, both the causes and effects have been perceiv'd by the senses, and are remember'd; But in all cases, wherein we reason concerning them, there is only one perceiv'd or remember'd, and the other is supply'd in conformity to our past experience" (T 1.3.6.2; SBN 87). "Probability, as it discovers not the relations of ideas, consider'd as such, but only those of objects, must in some respects be founded on the impressions of our memory and senses, and in some respects on our ideas…'Tis therefore necessary, that in all probable reasonings there be something present to the mind, either seen or remember'd; and that from this we infer something connected with it, which is not seen nor remember'd" (T 1.3.6.6; SBN 89).

[4] This is why preliminary assurance is preserved in causal reasoning such that we secure the full assurance of a proof.

In the first chapter we saw that Hume's focus is on a type of probable reasoning that offers a procedure for making judgments about single events (T 1.3.12.11; SBN 134).[5] With this type of probable reasoning our aim is to determine what, if anything, we should presently believe, judge, or expect in the face of contrary evidence. Suppose my present concern is to figure out what time I'll arrive home and that an impression of my watch (which reads "5:30") is the foundation for my reasoning. To marshal the relevant evidence, I recall relevantly similar events with respect to relevantly similar circumstances. For the sake of simplicity, suppose this reflection supplies recollected events of my returning home by 6:00 p.m. in all but one instance. In that case, past experience affords relevant evidence that I'll arrive home by 6:00 p.m. *and* relevant evidence that I'll arrive home after 6:00 p.m. So given my present aims and circumstances, *contrary possibilities* are presently *live possibilities*.

With respect to a set of contrary evidence, a *probability* is a collection of live possibilities of the same type whose members outnumber the live possibilities of a contrary type(s) (T 1.3.12.14-1.3.12.18; SBN 135-37).[6] The live possibilities outnumbered by the probability are what Hume calls the "opposite possibility," which I've opted to call the *rival possibility*. So in our present case, that *I'll arrive home by 6:00 p.m.* is a probability and that *I won't arrive home by 6:00 p.m.* is the rival possibility. Since both a probability and its rival are "compos'd" of live possibilities, Hume says they are "of the same nature":

[5] Recall that this is Hume's third sense of "probability," viz., *probability as reasoning from conjecture*, which refers to a procedure for resolving the contrariety in a set of contrary evidence.

[6] Recall that this is Hume's second sense of "probability," viz., *probability as a superiority of evidence*, which refers to a collection of live possibilities of the same type that make up a majority of the evidence with respect to a set of contrary evidence.

> To every probability there is an opposite possibility. This possibility is compos'd of parts, that are entirely of the same nature with those of the probability. (T 1.3.12.17; SBN 136-37)

Insofar as they are of the same nature, Hume notes that a probability and its rival have "the same influence" over our judgment (T 1.3.12.17; SBN 136-37).

> Since therefore each part of the probability contributes to the production of the belief, each part of the possibility must have the same influence on the opposite side; the nature of these parts being entirely the same. (T 1.3.12.17; SBN 136-37)

Accordingly, at some point in our reasoning about a single event on the basis of contrary evidence, we have some degree of assurance for mutually exclusive event-types.

Hume explains this by saying that because live possibilities of contrary types cannot occur simultaneously, the preliminary assurance from a present impression "is broke into pieces" such that each live possibility "partakes an equal share of that force and vivacity" (T 1.3.12.10; SBN 134). Collecting live possibilities of the same type together, the distributing of preliminary assurance gives us some degree of assurance that events of contrary types will presently occur:

> The belief, which attends the probability, is a compounded effect, and is form'd by the concurrence of the several effects, which proceed from each part of the probability. Since therefore each part of the probability contributes to the production of the belief, each part of the possibility must have the same influence on the opposite side; the nature of these parts being entirely the same. The contrary belief, attending the [rival] possibility, implies a view of a certain object, as well as the probability does an opposite view. In this particular both these degrees of belief are alike. (T 1.3.12.17; SBN 137)

So at this stage of my arrival-time reasoning, I have a high degree of assurance that *I'll arrive home by 6:00 p.m.* and a low degree of assurance that *I won't arrive home by 6:00 p.m.*

But in a single case, "'tis evident…the contrary views" afforded by the selected evidence "are incompatible with each other, and 'tis impossible the object can at once exist conformable to both of them" (T 1.3.12.19; SBN 138). In other words, I recognize that, presently, I cannot both arrive home by 6:00 p.m. and fail to arrive home by 6:00 p.m. If I'm to make a judgment about a *single* event, I need to resolve the contrariety in the evidence. To that end, Hume proposes a balancing procedure where live possibilities of contrary types and their apportioned assurance cancel so that "*the mind is determin'd to the superior only with that force, which remains after subtracting the inferior*" (T 1.3.12.19; SBN 138, my emphasis). Understanding Hume's balancing procedure is crucial to understanding his account of probable reasoning in general and corrective reasoning in particular. So it's worth our time to briefly review Hume's procedure for making single-event judgments on the basis of contrary evidence.

In distinguishing between causal judgments and probable judgments it's convenient to say something like the following. Because they concern matters of fact, the falsity of any causal judgment and the falsity of any probable judgment is *conceivable*. However, causal judgments are grounded on uniform evidence from past experience. Because past experience supplies no positive evidence against them, causal judgments are made with the full assurance of *proof*. Probable judgments, on the other hand, are grounded on contrary evidence from past experience. Because past experience affords positive evidence against them, probable judgments must be made with something less than full assurance. While this is a useful way of distinguishing these different types of judgments, the "less than full assurance" ascribed to probable judgments is ambiguous between two readings.

I've argued that less than full assurance follows from balancing and cancelling live possibilities of contrary types along with their apportioned assurance. So when a probability is balanced against a rival, some portion of the probability's preliminary assurance is canceled. This is at odds with an influential interpretation that tells us the assurance for probable judgments is proportionate to the superior number of live possibilities that make-up the probability. On this reading, the less than full assurance of a probable judgment follows from the apportioning of preliminary assurance to live possibilities of contrary types. But revisiting Hume's description of single-event probable reasoning makes clear that this latter reading paints the wrong picture.

With respect to a set of contrary evidence, preliminary assurance is apportioned equally to each live possibility in the set. Given this apportioning, "in all determinations, where the mind decides from contrary experiments, 'tis first divided within itself, *and has an inclination to either side in proportion to the number of experiments we have seen and remember*" (T 1.3.13.20; SBN , my emphasis). If assurance for a probable judgment was proportionate to the number of live possibilities that make-up a probability, we would be done at this point. But because a probability and its rival are "of the same nature…[and] have the same influence on the mind and understanding," if we don't resolve the contrariety in the evidence we're left with contrary beliefs (T 1.3.12.17; SBN 136-37).

In resolving the contrariety by way of a balancing procedure, Hume remarks that the "contest is at last determin'd to the advantage of that side, where we observe a superior number of these experiments; *but still with a diminution of force in the evidence correspondent to the number of the opposite experiments*" (T 1.3.13.20; SBN 154, my emphasis). Hume is perhaps clearest on this procedure later in the *Treatise* where he offers the following summary:

> When any phænomena are constantly and invariably conjoin'd together, they acquire such a connexion in the imagination, that it passes from one to the other, without any doubt or hesitation. But below this there are many inferior degrees of evidence and probability, nor does one single contrariety of experiment entirely destroy all our reasoning. The mind ballances the contrary experiments, and deducting the inferior from the superior, proceeds with that degree of assurance or evidence, which remains. (T 2.3.1.12; SBN 403)

In short, Hume's balancing procedure requires canceling live possibilities of contrary types along with their apportioned assurance. The preliminary assurance apportioned to a probability is already less than full, and balancing cancels some portion of it. Then strictly speaking, *all* probable judgments are made with a *diminished* degree of less than full assurance. So when I say that a probable judgment is made with "less than full assurance," I mean this in Hume's strict sense of a diminished degree of less than full assurance.

Given Hume's balancing procedure, probable reasoning terminates in a probable judgment about a single event *only* where the contrary evidence includes a probability and its rival (T 1.3.12.17-18; SBN 136-37). Because a probability is made up of a superior number of live possibilities, at least one live possibility of that type and its apportioned assurance will survive balancing. In our present case, balancing cancels the single live possibility that *I won't arrive home by 6:00 p.m.* along with a single live possibility that *I will arrive home by 6:00 p.m.* The type of live possibility that survives balancing fixes the content of my probable judgment, viz., *I'll arrive home by 6:00 p.m.* The total assurance apportioned to the surviving live possibilities fixes the degree of assurance for my probable judgment. Thus, by selecting and balancing a set of contrary evidence, I make an initial probable judgment with a degree of less than full assurance that *I'll arrive home by 6:00 p.m.*

III. Correcting Initial Probable Judgments

We've seen that past experience affords an *imprecise* and *fallible* standard for probable reasoning such that judging in conformity with it is no guarantee of truth. Then even if I've reasoned from the right evidence and in the right way, my judgment that *I'll arrive home by 6:00 p.m.* might turn out to be false. This is what Hume describes as "the original uncertainty inherent" in probable reasoning—we might reason legitimately but nevertheless arrive at a false judgment (T 1.4.1.6; SBN 182). Still, where our judgments are made in conformity with the standard of past experience, it is not the case that we should have reasoned differently or made a different judgment. So regardless of their truth or falsity, if our judgments are reached by legitimate probable reasoning they are proportioned to the relevant evidence and we have judged as we should.

But whether a judgment has been reached by legitimate reasoning is a matter of fact that must be judged in accordance with relevant evidence from past experience. We've said that explicit consideration of the possibility that our present reasoning is illegitimate would undermine our reasoning and keep us from making or accepting any judgment whatsoever. Consequently, to make and accept a probable judgment requires presupposing the legitimacy of our probable reasoning. Recollected errors in probable reasoning are direct evidence against this presupposition and indirect evidence against any initial judgment. As Hume points out, even the best of us "must be conscious of many errors in the past, and must still dread the like for the future" (T 1.4.1.5; SBN 181-82). Then to stand pat with respect to any initial probable judgment is to ignore relevant evidence that it's wrong. So in addition to the original uncertainty, Hume

identifies probable errors as "a new uncertainty deriv'd from the weakness of that faculty which judges" (T 1.4.1.6; SBN 182).

In the second chapter we saw that the single type of error in matter of fact reasoning is an evidence selection error. We make this error and reason illegitimately whenever the selected evidence includes irrelevant evidence, excludes relevant evidence, or is imprecisely relevant given our actual aims and circumstances. When we reflect on our errors, perception and memory emerge as two sources of uncertainty in matter of fact reasoning generally.

An impression of sensation or memory is the necessary foundation of all matter of fact reasoning. Further, the evidence for matter of fact reasoning comes from past experience. So all matter of fact reasoning partially depends upon perception and memory. But all of us can recall evidence selection errors in matter of fact reasoning brought on by failures of perception and memory. For instance, from a combination of forgetfulness and misperception I mistook a speaker for a rock and reasoned from the wrong evidence. In the last chapter, we said that perception and memory are *probabilistic elements* associated with past errors.[7] Given their association with past errors, probabilistic elements mark a type of reasoning as a source of contrary evidence and, thus, a source of uncertainty. Insofar as it is a source of contrary evidence, matter of fact reasoning is a *philosophical source of uncertainty*. Consequently, all judgments reached by matter of fact reasoning are "subject to the controul of probability" in the form of a corrective step (T 1.4.1.5; SBN 182).

We said that a type of reasoning or judging is subject to the control of a corrective step if, due a "contrariety of events" in the past, its conclusions are uncertain:

[7] Recall that we said a "probabilistic element" is something required to engage in a type of reasoning or judging that is associated with past errors such that conclusions from that type of reasoning or judging are uncertain by the lights of past experience.

> [A]s 'tis frequently found, that one observation is contrary to another, and that causes and effects follow not in the same order, of which we have had experience, we are oblig'd to vary our reasoning on account of this uncertainty, and take into consideration the contrariety of events. (T 1.3.12.4; SBN 131)

Hume calls the contrary evidence from recollected judgments "a new species of probability" whose consideration works to "correct and regulate" our initial judgments (T 1.4.1.5; SBN 181-82).[8] The crucial point for the Diminishment Argument is that past experience shows that our matter of fact reasoning is sometimes legitimate and sometimes not. Since "[o]ur reason must be consider'd as a kind of cause," recollected errors are evidence that any present matter of fact judgment may be similarly mistaken (T 1.4.1.1; SBN 180). Then by the lights of past experience, the legitimacy of any instance of matter of fact reasoning is merely probable. As such, all matter of fact judgments are subject to the control of a corrective step. Unpacking this consequence for causal judgments helps to shed light on what it means to say that probable judgments are themselves subject to the control of "probability."

Hume describes judgments from causal reasoning as "proofs" that "are entirely free from doubt and uncertainty" (T 1.3.11.2; SBN 124). Proofs are "free from doubt and uncertainty" insofar as they are grounded on uniform evidence from past experience. But to secure the full assurance of a proof, we need to be sure that our causal reasoning is legitimate. Past experience proves that our causal reasoning is sometimes illegitimate. Reflection on our past errors confirms that any present causal judgment may be similarly mistaken. Then insofar as they are the products of causal reasoning, proofs are uncertain, and "we are oblig'd to vary our reasoning

[8] More precisely, our recollected judgments are a "new probability" in that they are an as yet unconsidered source of contrary evidence.

on account of this uncertainty" (T 1.3.12.4; SBN 131). Thus, causal reasoning is a philosophical source of uncertainty such that its conclusions are subject to the control of a corrective step.

We can say something similar for judgments reached by probable reasoning. Probable judgments follow from balancing contrary evidence. Insofar as they are grounded on contrary evidence, probable judgments are uncertain—hence, the "original uncertainty" of probable reasoning and Hume's first sense of "probability." To secure the less than full assurance of a probable judgment, we need to be sure that our probable reasoning is legitimate. Past experience proves that, in addition to the original uncertainty, our probable reasoning is sometimes illegitimate. This marks "a new uncertainty" since our past errors confirm that any present probable judgment may be similarly mistaken (T 1.4.1.6; SBN 182-83). Then insofar as they are the products of probable reasoning, probable judgments are uncertain, and "we are oblig'd to vary our reasoning on account of this uncertainty" (T 1.3.12.4; SBN 131). Because probable reasoning is a philosophical source of uncertainty, its conclusions are subject to the control of a corrective step; thus, "[a]s demonstration is subject to the controul of probability, so is probability liable to a new correction by a reflex act of the mind" (T 1.4.1.5; SBN 181-82).

When our initial reasoning continues with a corrective step, an initial judgment is the object and foundation for our corrective reasoning. That is, an initial judgment informs our selection of evidence and supplies the preliminary assurance for our corrective reasoning. Hume puts this by saying that, in a corrective step, "the nature of our understanding, and our reasoning from the first probability become our objects" (T 1.4.1.5; SBN 181-82). So far we've seen two explanations for why initial assurance cannot increase but must inevitably diminish in a corrective step. First, we showed that evidence in support of an initial presupposition of legitimacy is accounted for in any initial step of reasoning. Consequently, any evidence that an

initial presupposition of legitimacy is true must be neutral with respect to an initial judgment. Second, we noted how any evidence that a presupposition of legitimacy is true is evidence that we've reached the right judgment such that it shouldn't be altered in any way.[9] On the other hand, any evidence that a presupposition of legitimacy is false is ignored in an initial step of reasoning and affords indirect evidence that we've made the wrong judgment. So only evidence against a presupposition of legitimacy makes a difference to our judgments. Thus, if a single recollected error is among the evidence in a corrective step—which Hume claims must always be the case—our initial assurance inevitably diminishes.

To keep our example as simple as possible, suppose I recall having made an evidence selection error in relevantly similar circumstances on only one occasion. In that case, the contrary evidence for my corrective reasoning includes only one recollected error. Even so, balancing cancels a live possibility with its apportioned assurance from the probability and the single live possibility with its apportioned assurance from the rival. This fixes a degree of less than full assurance for my initial presupposition of legitimacy, thereby diminishing my initial assurance. Thus, from balancing a set of contrary evidence in a corrective step, I make my corrected judgment with a diminished degree of initial assurance that *I'll arrive home by 6:00 p.m.*

This all might appear objectionably arbitrary since I haven't given a precise account of the evidence or apportioning of preliminary assurance in a corrective step. But the framework established in the third chapter confirms that providing such an account is unnecessary. The only assumption needed to secure the Diminishment Argument's conclusion is that the evidence in a

[9] We made this point with an idealized case. There we showed that even a proof of legitimacy cannot increase our initial assurance, since it is a proof that we've reached the right judgment such that any alteration of that judgment is unwarranted.

corrective step includes at least one recollected error.[10] So long as this is granted, a portion of the preliminary assurance supplied by an initial judgment must be canceled when the *contrary* evidence is balanced. Thus, we needn't specify an actual set of evidence or give a precise accounting of the apportioning of preliminary assurance to conclude that continuing our initial reasoning with a corrective step inevitably diminishes our initial assurance.

Hence, the upshot of the Diminishment Argument is similar to that of the Degeneration Argument. In principle, causal reasoning secures the full assurance of a proof and probable reasoning secures the less than full assurance of a probable judgment. But matter of fact reasoning is a philosophical source of uncertainty, and from a "contrariety of events" in the past, all matter of fact judgments are subject to the control of a corrective step. So in practice, all causal judgments must be made with something less than full assurance and all probable judgments must be made with a diminished degree of less than full assurance. Thus, the Diminishment Argument shows that causal and probable judgments that are possible *in principle* cannot be maintained *in practice*.

IV. Correcting Corrections and the Extinction of Belief

The Degeneration Argument and the Diminishment Argument leave us with corrected initial judgments. But having made a corrected judgment, we face the question of whether it has been reached by legitimate reasoning. And this sets the stage for the Extinction Argument.

[10] There is a second assumption at work here, viz., that the evidence for corrective reasoning includes a probability of legitimacy. Absent this assumption the Diminishment Argument would secure the conclusion of the Extinction Argument. That is, unless there is a probability of legitimacy, then either (i) the set of evidence includes a probability of illegitimacy, in which case an initial judgment ought to be rejected, or (ii) the evidence does not include a probability at all, which entails a suspension of judgment. While these results may occur for some especially tenuous initial judgments, Hume's concern is with more familiar circumstances where there's a probability of legitimacy with respect to the evidence for corrective reasoning.

Corrective reasoning is a special case of probable reasoning where we balance the contrary evidence from recollected judgments. To make and accept a judgment on the basis of our corrective reasoning requires presupposing the legitimacy of that reasoning. Recollected errors in probable reasoning are relevant evidence against this presupposition. Then to accept any corrected judgment solely on the basis of our corrective reasoning is to ignore relevant evidence that it's wrong:

> Having thus found in every probability, beside the original uncertainty inherent in the subject, a new uncertainty deriv'd from the weakness of that faculty, which judges, and having adjusted these two together [in a corrective step], we are oblig'd by our reason to add a new doubt deriv'd from the possibility of error in the estimation we make of the truth and fidelity of our faculties. (T 1.4.1.6; SBN 182)

In other words, having completed a corrective step, relevant evidence that we've made the wrong judgment remains to be considered. So by the lights of past experience, corrective reasoning is a philosophical source of uncertainty, which means corrected judgments are themselves subject to the control of a corrective step.

Hume remarks that "[t]his is a doubt, which immediately occurs to us, and of which, if we wou'd closely pursue our reason, we cannot avoid giving a decision" (T 1.4.1.6; SBN 182). In that case, our initial reasoning must continue with an additional step of corrective reasoning. With a second corrective step, a corrected initial judgment is the object and foundation of our reasoning. As we said with the Diminishment Argument, what matters for the Extinction Argument is not the *amount* or *degree* of assurance diminished in a corrective step, but *that* corrective reasoning entails some degree of diminished assurance.

But to help illustrate the point, suppose that 1* is the smallest possible unit of assurance and that the evidence for a second corrective step includes only one recollected error. This live possibility must be apportioned at least 1* of the preliminary assurance from my corrected initial judgment. Balancing cancels this single live possibility along with a single live possibility from the probability. As a result, 2* of the preliminary assurance is cancelled when the probability is balanced against its rival. This fixes a degree of less than full assurance that my reasoning in the previous step is legitimate, which diminishes my assurance for any judgment reached in that step. In this way, assurance for any judgment made in a first corrective step inevitably diminishes in a second corrective step. So when I continue my initial reasoning with a second step of corrective reasoning, my initial assurance further diminishes to yield the twice corrected judgment that *I'll arrive home by 6:00 p.m.*

In our example, the evidence for a second corrective step includes a probability (i.e., a superiority of evidence) that the reasoning in a first corrective step is legitimate. Considered in this light, a second corrective step appears to be "favourable to our preceeding judgment" (T 1.4.1.6; SBN 182). But granting Hume's assumption that there's always a relevant error to account for, any corrected judgment must be grounded on contrary evidence. And from balancing live possibilities of contrary types, a portion of preliminary assurance must be cancelled in any step of corrective reasoning. Thus, any corrective step, "tho' it shou'd be favourable to our preceeding judgment, being founded only on probability, must weaken still farther our first evidence" (T 1.4.1.6; SBN 182).[11]

[11] Here "probability" marks contrary evidence. Strictly speaking, all probable judgments are made with a diminished degree of less than full assurance as a result of balancing and cancelling contrary possibilities. So even a "favourable" judgment entails some degree of diminishment when it is "founded" on contrary evidence.

By referring to our "first evidence," Hume is reminding us that corrective reasoning is the continuation of our initial reasoning. In an initial step of reasoning we make an initial judgment with an initial degree of assurance. A first step of corrective reasoning introduces contrary evidence that diminishes a portion of the preliminary assurance from an initial judgment. Likewise, a second step of corrective reasoning introduces contrary evidence that diminishes a portion of the preliminary assurance from a corrected initial judgment. But the preliminary assurance supplied by a corrected initial judgment is the diminished degree of initial assurance that survives a first step of corrective reasoning. Consequently, each corrective step introduces additional contrary evidence that "must weaken still farther our first evidence," thereby further diminishing our initial assurance.

From here, the inevitable slide toward extinction becomes clear. Because corrective reasoning is a philosophical source of uncertainty, all corrected judgments are subject to the control of a corrective step. So each step of correction and diminishment must be followed by an additional corrective step. In that case, our initial reasoning must continue with successive steps of correction and diminishment "*in infinitum*; till at last there remain nothing of the original probability, however great we may suppose it to have been, and however small the diminution by every new uncertainty" (T 1.4.1.6; SBN 182, Hume's emphasis). Then even if we suppose that each corrective step diminishes only 2* from our initial assurance, we must eventually reach a step where whatever remains of our initial assurance is canceled:

> Let our first belief be never so strong, it must infallibly perish by passing thro' so many new examinations, of which each diminishes somewhat of its force and vigour…[thus,] all the rules of logic require a continual diminution, and at last a total extinction of belief and evidence. (T 1.4.1.6; SBN 182-83)

Since no "finite object can subsist under a decrease *in infinitum*," successive steps of correction and diminishment drive us to Hume's infamous conclusion (T 1.4.1.6; SBN 182, Hume's emphasis). Ultimately, if I reason as I should by accounting for all relevant evidence, I'm forced to suspend judgment about my arrival-time, the company's financial state, and the (apparent) color-resemblance of those fire engines. Thus, *in practice*, the extinction of all knowledge and belief is the remarkable consequence of the seemingly innocuous admission that we're able to detect and recall errors in reasoning.

V. The Extinction of Belief *and* Evidence

Much in the way that corrective steps are the continuation of our initial reasoning, the Extinction Argument is the continuation of the Degeneration Argument *and* the Diminishment Argument. By the lights of past experience, *all* reasoning is a philosophical source of uncertainty. This explains why the Extinction Argument's scope is unrestricted such that it extends to any judgment reached by reasoning. What Hume takes himself to have shown is how proportioning our belief to *all* relevant evidence entails a total *extinction* of belief and evidence.

From what we've set out above, it's fairly clear what Hume means in declaring "a total extinction of belief." Judgments from any type of reasoning are subject to the control of a corrective step. This commits us to successive steps of correction and diminishment that must entirely diminish our initial assurance to yield a suspension of judgment. Regarding this aspect of Hume's conclusion, most interpreters are in agreement that the "extinction of belief" just is the total diminution of initial assurance. But there is room for disagreement about what Hume means by listing *evidence* among the victims of extinction.

An especially influential interpretation tells us that by "evidence" Hume (usually) means something like *evidentness,* assurance, or assent.[12] Accordingly, it's a mistake to understand the extinction of evidence as the extinction of evidential grounds or what justifies our beliefs and judgments. Instead, Hume is merely describing the anticipated psychological effects of these skeptical arguments. On my interpretation, this reading is mistaken. The extinction of evidence marks the inevitable consequence of successive corrective steps that ultimately undermine the evidential grounds for our judgments. One way to frame the disagreement here is to say that, while my opponents and I agree that the extinction of belief is a total diminution of initial assurance, we disagree over how this total diminution is supposed to be produced.

David Owen (1999) defends the "evidentness" reading and sets-up his argument with the following description of what I've called successive steps of correction: "Our inherent fallibility is always a consideration, weakening the force with which the original belief is held" (183). The idea is that in each step of the Extinction Argument, the continual consideration of our fallibility works to diminish our assurance for an initial judgment. But on Owen's reading, what is weakened is not the *evidential grounds* but their *effect* on us:

> [I]n most places, 'evidence' means some thing like 'evidentness'; that is to say, 'evidence' means just the same thing as 'assent' or 'conviction'…One can argue against reading 'evidence' as 'evidential grounds' in the following way. How could a subsequent judgment affect the original evidence, when 'evidence' is treated as 'evidential grounds', interpreted in terms of what justifies our belief? It is not as if the original evidence turns out to be false or misleading; it is just that it ceases to have the effect on us that it originally had. So we can say that what is weakened is either the assent itself or the causal efficacy of

[12] See especially Don Garrett (1997) and David Owen (1999).

> whatever it is that causes my assent. But in neither case does it have anything to do with what justifies the belief. (185)[13]

Owen is right that the Extinction Argument does not deliver the extinction of belief by showing that the original evidence is "false or misleading." However, what it does show is that the initial evidence is *incomplete* insofar as recollected errors are relevant evidence that is necessarily unaccounted for in any step of reasoning.

Taking this unaccounted-for evidence onboard requires continuing our initial reasoning with successive corrective steps. Each corrective step introduces *additional* evidence that, in light of past errors, must be contrary and, thus, "must weaken still farther our first evidence" (T 1.4.1.6; SBN 182). This continual addition of contrary evidence gradually undermines the evidential grounds for any initial judgment. Ultimately, successive corrective steps will yield a set of evidence that fails to ground any judgment at all. This result is perhaps best explained not as the *extinction* of evidence but a consequence of its proliferation. So while Owen is right that the original evidence doesn't turn out to be false or misleading, upon reflection we realize that the original evidence doesn't include all of the relevant evidence. Then what the Extinction Argument shows is that, in practice, consideration of *all* relevant evidence fails to ground any judgment whatsoever. Thus, the extinction of belief follows from the "extinction" of evidential grounds.

[13] Owen (1999) does grant that at least sometimes "evidence" means something like evidential grounds but denies that this indicates what justifies our beliefs: "It is true that in some instances, Hume uses 'evidence' to refer to what causes in us the degree of assent we give to belief. In this sense, 'evidence' does mean something more like 'evidential grounds', but even in this case, 'evidence' does not mean 'what justifies us in the belief' so much as 'what causes us to have the degree of assent, i.e., force and vivacity, that we in fact have'" (185).

VI. Conclusion

Hume's "Of scepticism with regard to reason" shows that, like chances and causes, *reasoning* is a philosophical source of uncertainty. As such, judgments from any type of reasoning are "subject to the controul of probability" and, thus, correction and diminishment (T 1.4.1.5; SBN 181-82). Each step of corrective reasoning establishes a degree of less than full assurance for the presupposition that our reasoning in a previous step is legitimate. Less than full assurance for the presupposition that our reasoning in a previous step is legitimate diminishes our assurance for any judgment reached in that step. Accordingly, successive steps of correction entail successive diminutions of our initial assurance. As a result, the full assurance of knowledge degenerates to the less than full assurance of a probable judgment, and the less than full assurance of a probable judgment diminishes to nothing. Thus, to reason as we should entails suspending judgment with respect to any question that calls for reasoning.

Offering his own assessment of these skeptical conclusions, Hume supposes we'll "find no error in the foregoing arguments" (T 1.4.1.8; SBN 184). While the conclusions may be surprising, the claim that we'll find no error is especially striking given the way the arguments have been received. Contrary to what Hume supposes, much of the debate about this section has not been over whether there is some error, but rather, how many errors there are, which ones are the most egregious, and whether any of them might be overcome. Along the way, we've touched on some of the objections to Hume's skeptical arguments. But in the next chapter we'll take a focused look at the most salient and long-standing challenges to Hume's "Of scepticism with regard to reason." With the framework developed in the preceding chapters we'll see how these objections stem from mistaken assumptions about Hume's purpose and misconceptions about the procedure that delivers his skeptical conclusions.

Chapter 6

Answering Objections
and
Alternative Interpretations

- **Introduction**

Along the way, we've touched on some challenges to Hume's skeptical arguments against reason. The aim of this chapter is to present a considered examination of the most forceful and long-standing objections to the arguments in "Of scepticism with regard to reason." While there have been many, we can divide the objections here into three types, depending upon where they think the arguments go wrong. The first type claims that the arguments fail because corrective reasoning fails to play any corrective role. The second type grants that corrective reasoning plays a corrective role but denies that it must be one of diminishing our assurance for judgments. The third type grants that assurance inevitably diminishes in corrective steps but challenges Hume's claim that this ushers in a "total extinction of belief and evidence" (T 1.4.1.6; SBN 182-83).[1] In what follows we'll see how objections of each type overlook the presupposition targeted by Hume's arguments and mischaracterize the nature of the corrective steps that drive them.

This (admittedly long) chapter is divided into four parts, each with its own brief introduction. Part one is devoted to objections that target corrective reasoning. There are two objections to consider here, a restricted version that questions only the degeneration of knowledge and an unrestricted objection that challenges corrective reasoning generally. From

[1] References to the *Treatise* are to David Hume, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton (Oxford: Clarendon Press, 2000), hereafter cited in the text as "T" followed by Book, part, section, and paragraph, and to *A Treatise of Human Nature*, ed. L. A. Selby-Bigge, revised by P. H. Nidditch, 2nd ed. (Oxford: Clarendon Press, 1978), hereafter cited in the text as "SBN" followed by page number.

there, part two looks at challenges to Hume's claim of inevitable diminishment. These objections focus on probable judgments, where it seems most plausible that correction might yield an increase of assurance. Part three addresses objections to Hume's extinction claim. The charge here is that granting inevitable diminishment does not *by itself* entail even substantial diminishment of our initial assurance and, even if it did, some fraction of assurance must always remain.

After responding to these objections, the fourth and final part of the chapter addresses some residual worries and makes some general observations about alternative interpretive strategies. By the time we get here, I hope to have shown that whether they think the arguments fail or succeed, commentators share mistaken assumptions about the aims and outcomes of corrective reasoning. As I see it, the central problem for alternative interpretations has to do with their starting point. By focusing on questions of human fallibility or the reliability of reason, interpreters end up misidentifying the impetus for corrective reasoning and the evidence that informs it. Having made it to this final chapter, we've seen how recollected errors prompt corrective steps and how recollected judgments supply the contrary evidence balanced in those steps. The interpretation developed here clarifies Hume's purpose in "Of scepticism with regard to reason" and distills his skeptical arguments into the following claim:

> *In practice, proportioning judgments to all relevant evidence requires continuing any initial step of reasoning with successive corrective steps that entail the extinction of all knowledge and belief.*

- **Part 1: Corrective Reasoning**

I. Questioning Corrective Reasoning's "Corrective" Role

There are at least two ways to challenge the corrective role Hume claims for corrective reasoning. The first is a restricted objection that targets only the Degeneration Argument. The suggestion here is that *knowledge* must be safe from degeneration because corrective reasoning cannot *transform* the known into the merely probable.[2] So at least with respect to demonstrative judgments, corrective reasoning seems incapable of playing the corrective role Hume supposes.

The second objection poses an unrestricted challenge to correction by arguing that the evidence for corrective reasoning is irrelevant for revising initial judgments. In a corrective step, we're reasoning about an initial judgment. But a corrective judgment *about* an initial judgment cannot *change* an initial judgment in any way. So, in general, corrective reasoning cannot play the corrective role Hume imagines.

Though the details of these objections are importantly different, they emerge as a result of overlooking the presupposition targeted by Hume's arguments. The restricted version tacitly relies on a presupposition of legitimacy in claiming that demonstrative reasoning yields knowledge so as to make a puzzle of degeneration. The unrestricted version misidentifies correction as an unrelated stage of reasoning because a presupposition of legitimacy goes unnoticed. Thus, we can show where these objections go wrong by bringing this presupposition to the forefront to clarify the target of Hume's skeptical arguments and the corrective procedure that drives them.

[2] The following quotation is usually cited as the grounds for this restricted objection: "knowledge and probability are of such contrary and disagreeing natures, that they cannot well run insensibly into each other, and that because they will not divide, but must be either entirely present, or entirely absent" (T 1.4.1.3; SBN 181). If they can't "run insensibly into each other," the suggestion that one might *degenerate* into the other is at least a bit puzzling.

II. Questioning the Degeneration

There's nothing spooky or mysterious about the claim that our initial assurance for matter of fact judgments diminishes somewhat in a corrective step. But with the Degeneration Argument, it looks like Hume is making the extraordinary claim that corrective reasoning has transformative powers. For one thing, the falsity of any probable judgment is conceivable whereas the falsity of what is known is inconceivable. What's more, Hume tell us that "knowledge and probability are of such contrary and disagreeing natures that they must be either entirely present or entirely absent" (T 1.4.1.3; SBN 181).[3] In that case, the difference between knowledge and probability is a difference in kind rather than degree.

But then, as Kevin Meeker (2007) dramatically puts it, "[k]nowledge transforming into probability would be like an alligator transforming into gold" (235).[4] However, this is precisely what Hume seems to be saying with the Degeneration Argument, viz., that corrective reasoning somehow *transforms* one kind of thing into a completely different kind of thing. Given the outrageousness of the claim, it looks like corrective reasoning cannot play the corrective role Hume imagines.

While reasoning cannot transform one kind of thing into another kind of thing, it might give us grounds for *rejecting* one kind of thing in favor of another kind of thing. Indeed, one way to respond to the problem here is to say that knowledge is not transformed into probability

[3] For the purposes of these objections I'll use "probability" in the more familiar sense intended by commentators. However, in replying to these objections I'll make clear the sense I believe Hume intends.

[4] David Owen (1999) identifies the bizarreness of this result by asking the following questions: "If something known is such that its contrary is inconceivable, what effect could a [corrective] belief have? Turn the inconceivable into the conceivable?" (181). Owen also poses the following illustrative questions: "If knowledge and probability are of such differing natures, why need they conflict at all? Is not the knowledge that two plus two equals four one thing, and the doubts about our performing calculations correctly another? Why does the certainty of the demonstration turn into the different sort of conviction or assent we give belief?" (181).

but is *replaced* by a probable judgment. David Owen (1999) describes this as the "usual" way to read Hume's conclusion:

> It is usual to understand [the degeneration] claim as amounting to something like this: any claim that one has knowledge that *p* must be replaced by a claim that one has only probable belief that *p*. (182)

While this may be usual, we need some further argument as to why knowledge should be abandoned in favor of probable belief. To adapt Meeker's analogy, trading an alligator for gold may be wise, but we may well question the wisdom of trading knowledge for probability. Furthermore, if knowledge is *replaced* by a probable belief, then corrective reasoning fails to play the corrective role Hume imagines since knowledge fails to *degenerate*.

In response to the degeneration puzzle, Owen presents a two-step solution. The first step is to note that when Hume says knowledge degenerates into probability, he is not saying that corrective reasoning transforms the inconceivable into the conceivable. Correction neither requires nor entails that the falsity of an initial demonstrative judgment is conceivable. Instead, Owen suggests that to admit the possibility of error is to admit that the falsity of an initial demonstrative judgment may not *actually* be *inconceivable*:

> [T]he denial of [a] mathematical proposition need not always appear inconceivable. Using Hume's argument in 1.4.1…we might easily persuade ourselves that there is a good chance that we have made an error in our calculations, and that *the contrary may not be inconceivable*. (182, my emphasis)

In other words, if we've made some undetected error, then the falsity of a demonstrative judgment may appear inconceivable even if its falsity is not *actually* inconceivable. So worrying that we've made some error is enough to cast doubt on any demonstrative judgment.

The second step is to see that casting doubt on a demonstrative judgment by worrying that we've made some error means doubting that the judgment is actually *demonstrative* (182). By Owen's lights, this shows that we're no longer entitled to a claim of knowledge:

> [W]e must now rest content, not with demonstrative knowledge of the proposition, but only with the probable belief that our doubts are feckless and that the proposition is demonstratively true. And that is all Hume needs. (182)

So after reflecting on the possibility of present error, we're left with the merely probable judgment that our initial judgment is demonstrative. Owen describes this as a knowledge claim becoming "embedded" in a probable judgment:

> [A]ny claim that one has knowledge that *p* must be replaced by the claim that one has a probable belief that one has knowledge that *p*. It is not that the claim to knowledge drops out; it is just that it becomes embedded in a belief claim. (182)

So corrective reasoning neither transforms knowledge nor simply replaces it with a probable judgment. Supposing Owen is right, when Hume says that knowledge "degenerates" he is saying that knowledge claims become embedded in probable judgments as a result of correction. However, both Owen's solution and the problem it aims to solve rest on a misunderstanding.[5]

III. Solving the Apparent Degeneration Puzzle

While Owen offers a way around the objection, both the objection and Owen's reply start from the assumption that demonstrative reasoning delivers knowledge. The objection needs this assumption to make a puzzle of degeneration, and Owen grants it with a solution that preserves knowledge by embedding it in a probable judgment. However, the assumption that

[5] However, see Meeker (2007) for additional criticisms of Owen's proposal.

demonstrative reasoning yields knowledge tacitly relies on the presupposition of legitimacy targeted by Hume's skeptical arguments against reason.

Recall that Hume restricts the demonstrative sciences to algebra and arithmetic. Because we are "possest of a precise standard, by which we can judge of the equality and proportion of numbers," demonstrative judgments are *possible* objects of knowledge (T 1.3.1.5; SBN 71). When we reason from the right evidence and in the right way, our demonstrative reasoning "preserve[s] a perfect exactness and certainty" (T 1.3.1.5; SBN 71). In such cases, our demonstrative judgments concern ideas that *actually* stand in a constant relation.[6] More precisely, where our demonstrative reasoning is legitimate, "we determine [these] relations, without any possibility of error" such that the falsity of our judgments is actually inconceivable (T 1.3.1.5; SBN 71). But past experience confirms that our demonstrative reasoning is sometimes legitimate and sometimes not. So it's merely probable whether any present demonstrative reasoning is actually legitimate. Hence, to suppose that demonstrative reasoning yields knowledge requires *presupposing* the legitimacy of demonstrative reasoning.

That Owen presupposes the legitimacy of demonstrative reasoning is perhaps clearest when he describes demonstrative reasoning as yielding judgments of the form "I know that *p*" (182).[7] But demonstrative reasoning doesn't yield knowledge claims of the form "I know that *p*" any more than probable reasoning yields probable judgments of the form "Probably *p*." For instance, when I execute my accounting duties, I don't end up with the judgment that "I *know* the company is $30,000 in the red." Rather, because initial judgments are "deriv'd from the nature

[6] And, as we saw in chapter four, the same can be said of objects of sensation and memory so long as the ideas are adequate representations of them.

[7] In setting out the puzzle, Owen also presupposes the legitimacy of demonstrative reasoning in order to mark a difference between knowledge and probability in terms of our ability to conceive of propositions, saying that for "demonstration, we can conceive them only in one way…while in belief it is equally easy to conceive the proposition positively or negatively" (181).

of the objects," my initial demonstrative judgment is that *the company is $30,000 in the red* (T 1.4.1.5; SBN 181-82). The further claim that this is something I *know*, depends upon the truth of the presupposition that my initial reasoning is legitimate. The question pressed by the arguments in "Of scepticism with regard to reason" is whether a presupposition of legitimacy is ever fully warranted. In light of past errors, it is not. Hence, in order to make a puzzle of degeneration, the objection and Owen's reply must illicitly rely on the presupposition targeted by Hume's argument.

But there is a further point we need to address to fully respond to the (apparent) degeneration puzzle. Both the objection and Owen's reply suppose a difference in kind between knowledge and probability. In one sense this is true. Demonstrations concern relations of ideas while probable judgments concern matters of fact. As such, all matter of fact conclusions are conceivably false while the falsity of what is known is inconceivable. However, this is best understood as marking a difference in the nature of the things *that* we accept or believe rather than a distinction in *how* we accept or believe them.

Indeed, Hume often describes knowledge as a kind of *assurance*. "By knowledge," Hume says, "I mean the *assurance* arising from the comparison of ideas" (T 1.3.11.2; SBN 124, my emphasis). Making a more precise point, Hume says that "the assurance of a demonstration proceeds always from a comparison of ideas" (T 1.3.4.3; SBN 84). Tellingly, Hume likens the assurance that arises from a comparison of ideas to the assurance attending memory:

> This force and vivacity are most conspicuous in the memory; and therefore our *confidence* in the veracity of that faculty is the greatest imaginable, and equals in many respects the *assurance* of a demonstration. (T 1.3.13.19; SBN 153-54, my emphasis)

Then what sets demonstrative reasoning apart is not that it yields judgments of which we are (initially) fully assured. Rather, what is unique about demonstrative conclusions is that they concern ideas that (appear) to stand in a constant relation. This is what allows us to distinguish the assurance of demonstrative *certainty* from the full assurance of a causal proof. Thus, properly understood, the "degeneration" of knowledge just is the diminution of an initial degree of assurance that arises from a comparison of ideas.

Nevertheless, to accept a demonstrative conclusion with with any degree of assurance is to accept with some degree of assurance that its target ideas stand in a constant relation. Put differently, to believe a demonstrative conclusion with any degree of assurance is to believe with some degree of assurance that its falsity is inconceivable. So when knowledge "degenerates" in a corrective step, the nature of what we believe is unchanged while the assurance with which it is believed diminishes.

By briefly revisiting our discussion of intuitions, we can clarify this point with a situation that (I hope) is familiar to everyone. Recall that, like demonstrations, intuitions concern objects and ideas that appear to stand in constant relations. Suppose I look out the window and immediately judge that *those two fire engines resemble with respect to their color*. So long as this intuition of objects is adequate, i.e., so long as the ideas are adequate representations of the objects, it is inconceivable that the fire engines could fail to stand in the relation of color-resemblance (T 1.2.2.1; SBN 29). In general, just in case the adequacy of our intuiting is presupposed, the falsity of an intuition of objects is inconceivable.

But all of us are able to recall inadequate intuitions of objects. These recollected errors are evidence against any present presupposition of adequacy. Taking this evidence onboard fixes a degree of less than full assurance for an initial presupposition of adequacy, which diminishes

our initial assurance for any intuition of objects. Then upon reflection, I must be less than fully assured that *those two fire engines resemble with respect to their color*. But given the nature of intuitions, if we accept them with any degree assurance we believe with some degree of assurance that the target objects (or target ideas) stand in a constant relation.[8] So while I have less than full assurance for my intuition that *those two fire engines resemble with respect to their color*, I have some degree of assurance that its falsity is inconceivable.

In fact, we can say a bit more here by way of an explanation when we recall that the less than full assurance for probable judgments follows from balancing contrary evidence. When we balance contrary evidence with respect to a presupposition of legitimacy or adequacy, the resultant assurance for corrected demonstrations and intuitions is partially grounded on contrary evidence. As a result, the assurance for corrected intuitions and demonstrations no longer arises *solely* from a comparison of ideas. Instead, the assurance "arising from the comparison of ideas" degenerates into the less than full assurance of a probable judgment from the addition of contrary evidence in a corrective step (1.3.12.2; SBN 130-31). This is what it means to say that, in practice, all knowledge degenerates into probability.

Still, interpreters are right that knowledge is distinguishable from causal and probable judgments in terms of conceivability. Unlike a matter of fact judgment, the falsity of a genuine demonstration is inconceivable. What's more, the Degeneration Argument does nothing to call this into question. The problem pressed by the argument is that, laboring under a presupposition of legitimacy, the falsity of *any* demonstrative conclusion appears inconceivable. This is

[8] What's significant about this case is not just that it helps to clarify Hume's point. It's also something all of us can experience and probably have. When we *experience* the diminishment of assurance for an intuition of objects, we continue to believe that the objects can't fail to stand in the relevant constant relation. It's just that past experience has taught us not to get carried away by first impressions. In more Humean terms, weighing in the evidence from recollected errors diminishes assurance for intuitions of objects by diminishing assurance for the presupposition that they are adequate.

precisely the problem with errors in general. Scrutiny of an initial judgment will never reveal whether it has been reached by legitimate reasoning or, in the case of demonstrations, that its falsity is *actually* conceivable.

Just as our causal and probable judgments are not undermined by the fact that their falsity is conceivable, our demonstrative judgments are not safe from degeneration merely because their falsity is (apparently) inconceivable. The degree of assurance we have for demonstrative conclusions partially depends upon the degree of assurance we have for the presupposition that they've been reached by legitimate reasoning. In light of past errors, our assurance for this presupposition can never be full. As a result, our assurance for any demonstrative conclusion can never be full. Thus, the lesson from the Degeneration Argument is that, in practice, we can never be fully assured of a demonstrative judgment in spite of the apparent inconceivability of its falsity.

IV. An Unrestricted Objection to Corrective Reasoning

While there's nothing special about demonstrative conclusions that saves them from degeneration, an unrestricted objection to the supposed role of corrective reasoning remains open. One way to frame this general challenge is to say that corrective reasoning fails to play a corrective role because it changes the subject. With our initial reasoning, we're addressing questions about, for instance, a company's finances or our expected arrival-time. When we turn to corrective reasoning, we're addressing questions about, for instance, the correctness of an initial judgment, our fallibility, or the reliability of reasoning. But answers to these latter questions cannot change our answers to the former questions. For instance, a judgment about my fallibility will not change my judgment about the company's finances or the likelihood that it's

true. Likewise, a judgment that my initial judgment is probably correct does not actually change my initial judgment. Because corrective judgments don't seem relevant for revising initial judgments, corrective reasoning cannot play the corrective role Hume imagines.

The supposed failure of correction is sometimes explained by saying that Hume confuses probabilities of differing levels or judgments of differing orders. In the first chapter, we saw that a common interpretive strategy describes Humean probable reasoning as a mechanism for assigning numerical probabilities to propositions, judgments, or beliefs. Because it's a type of probable reasoning, corrective reasoning tends to be understood in the same way. We've shown how this reading gets Humean probable reasoning wrong. Nevertheless, I'll temporarily adopt this way of speaking to illustrate the thrust of the objection before moving on to show that it rests on a misunderstanding of corrective reasoning.

V. Corrective Reasoning and Revising Initial Probabilities

According to Hume, corrective reasoning facilitates the revision of initial judgments. Where probable reasoning is understood as a mechanism for assigning probabilities, the supposed result of correction is a lowering of the initial probability assignment for an initial judgment. But Robert Fogelin (1985) argues that carefully working through Hume's proposal reveals that corrective reasoning cannot lower or diminish "the original probability" in the way Hume imagines (T 1.4.1.6; SBN 182-83).

On the present reading, the Degeneration Argument's conclusion tells us that the probability we assign to any initial demonstrative judgment must be lowered in a corrective step. For any demonstrative judgment, the target ideas actually stand in a constant relation (in which case they can't fail to stand in that relation) or they don't. Accordingly, as Fogelin (1985) rightly notes, an initial demonstrative judgment can only be assigned "either the probability 1 or the

probability 0" (18). So if we're fairly confident that we've done things correctly, then we ought to assign an initial demonstrative judgment a probability of 1.

Admittedly, we sometimes make mistakes. Granting this much, we have at least some reason to worry that an initial probability assignment is mistaken. According to Fogelin's Hume, this worry prompts a corrective step aimed at assessing "whether we are correct in assigning the probability 1 rather than the probability 0" to an initial demonstrative judgment:

> [The result], if Hume is correct, is a probabilistic judgment, and the degree of probability that we will assign to it depends upon our assessment of the reliability of our faculties…We might maintain that here the probability is extraordinarily high, but this concedes Hume's point. However high it is, it does not amount to certainty. (18)

In other words, we might assign a high probability to the proposition that our initial probability assignment is correct. Even so, Hume claims that this corrective judgment about an initial assignment "must lead us to lower the probability assignment given to the original proposition" (Fogelin, 18). But according to Fogelin, this claim "is simply wrong":

> However certain or uncertain we are about our ability to calculate probabilities, if a proposition has a certain probability, that (tautologically) is the probability it has…[I]n a complex case we may be uncertain whether to assign the probability 1 or 0 to a mathematical proposition, yet this does not affect the first-level *probability assignment*, giving it some intermediate value. (18, my emphasis)

We said at the outset that, because they concern constant relations, we *know* that demonstrative judgments must be assigned a probability of 0 or 1. Uncertainty about this initial assignment might get us to change it from a 1 to a 0 or vice versa. However, our uncertainty cannot justify assigning a *demonstrative* judgment a probability *between* 1 and 0. Furthermore, a judgment

about the correctness of a probability *assignment* has no bearing on whether the target ideas actually stand in a constant relation. As such, a corrective step provides no grounds for revising the probability assigned to an initial demonstrative judgment. So corrective reasoning cannot play the corrective role needed to reach the Degeneration Argument's conclusion.

Fogelin highlights a similar problem for the Diminishment Argument, where a corrective step is supposed to lower the probability assigned to an initial probable judgment:

> Suppose, on the basis of certain evidence, we assign a probability of 0.8 to a given proposition. Then, following Hume's instructions, we reflect upon our ability to make such probability assignments. We might recognize that we are not very good at this sort of thing and assign a probability of 0.5 to the proposition that our original assignment was correct. Does this, in any way, alter the probability of the original proposition? Again the answer is no. (18)

Fogelin is making a fairly straightforward point here. The probability for an initial probable judgment is assigned on the basis of the initial evidence. Admitting that we sometimes make mistakes when assigning probabilities prompts a step of corrective reasoning. In light of past mistakes, a corrective step leads us to assign a probability of less than 1 to the proposition that our initial assignment is correct. This corrective judgment reflects our uncertainty as to whether an initial probability assignment matches the initial evidence. But a judgment about the correctness of an initial probability assignment does not change that assignment and has no bearing on whether it is actually correct. So corrective reasoning cannot deliver the Diminishment Argument's conclusion because corrective judgments have no bearing on our initial probability assignments. Thus, in general, corrective reasoning cannot play the corrective role Hume imagines.

VI. The Standard Reply

The standard reply to a Fogelin-style objection comes from William Morris (1989) and turns on distinguishing objective probabilities from subjective probabilities. We can agree that corrective reasoning has no bearing on the *objective* probabilities of initial judgments while allowing that it affects their *subjective* probabilities. In that case, Fogelin's mistake is in supposing that "correction" means the lowering of an objective probability:

> If Hume were claiming what Fogelin has him saying here—that reflecting on our ability to assess probabilities changes the objective probability a proposition has—he would indeed be wrong. But he is not claiming this. It is my confidence in having correctly assessed the probability that Hume claims should change. His regress is designed to further erode my confidence as the assessments iterate. (Morris, 52)

Following Morris, considering the possibility that an initial probability assignment is wrong naturally diminishes our confidence in that assignment. Understood in this way, Hume is making the far more plausible claim that corrective reasoning lowers the *subjective* probability associated with an initial judgment while leaving its objective probability unchanged.

Michael Lynch (1996) offers a similar diagnosis in explaining where Fogelin's objection goes wrong:

> According to Fogelin…[the argument] fails because of a confusion of levels…While clearly correct, this point only holds if Hume is concerned with objective, rather than subjective, probability. If our concern is how confident we are in our beliefs, not how probable they are in fact, then a lowering of confidence [that we have correctly assigned

> an initial probability] will result in a lowering of confidence [in that initial probability assignment]. (92)

Tellingly, Hume's description of a corrective step suggests an outcome in line with what Morris and Lynch describe:

> When I reflect on the natural fallibility of my judgment, I have less *confidence* in my opinions, than when I only consider the objects concerning which I reason. (T 1.4.1.6; SBN 182-83, my emphasis).

With this clarification, to suppose that a corrective step is meant to ground a revision of objective probabilities is to misunderstand the aim and purported effect of corrective reasoning. Insofar as it confuses objective and subjective probabilities, the unrestricted objection to corrective reasoning fails.

VII. A More Substantive Objection

Pointing out that corrective reasoning is meant to diminish initial assurance rather than change objective probabilities is generally taken to be an effective reply to a Fogelin-style objection. Uncertainty about the reliability of one's reasoning clearly has no bearing on objective probabilities. The obviousness of this point is a reason for thinking that Hume couldn't have made such a glaring error. However, it's also a reason for thinking that Fogelin doesn't intend to attribute the error to Hume. But whether or not Fogelin intends the attribution, his remarks allow for a more substantive objection.

As was mentioned at the outset, Fogelin understands probable reasoning as a mechanism for assigning probabilities to propositions. In developing his objection I tried to draw attention to this assignment-focused language. Granted, no judgment of ours has any bearing on the

objective probability of a proposition. But reflection on past errors may well impact our *assignments* of probabilities, whether these are understood as objective or subjective assignments. I take it Morris grants this point in saying that it "is my confidence in having correctly *assessed* the probability that Hume claims should change" (52, my emphasis).

Suppose that Morris and Lynch are right and that an initial probability assignment fixes a degree of assurance for an initial judgment. In that case, if correction diminishes our initial assurance, then correcting the "original probability" means lowering the probability assigned to an initial judgment (T 1.4.1.6; SBN 182-83). However, it's one thing to say, as Morris does, that my confidence in an initial assignment diminishes as a result of corrective reasoning. But it's another thing entirely to say that this justifies a *revision* of that initial assignment. Put differently, even if I'm uncertain about the correctness of an initial probability assignment, this doesn't necessarily mean I should change that assignment.

But this is precisely what Hume seems to suppose in concluding that successive steps of correction require successive revisions "till at last there remain nothing of the original probability" (T 1.4.1.6; SBN 182-83). I take it this is what Fogelin denies, namely, that corrective reasoning justifies revising "the *probability assignment* given to the original proposition" (18, my emphasis). From this clarification, we get a more substantive objection that we can cast in the following way. Because the evidence for corrective reasoning has no bearing on an initial probability assignment, corrective reasoning cannot justifiably ground the revision of those assignments.

This alternative reading explains the supposed failure of Hume's skeptical arguments by saying that Hume has confused independent bodies of evidence and independent judgments. In forming our initial judgments, we're reasoning about "the nature of the objects" (T 1.4.1.5; SBN

181-82). In a corrective step, we're reasoning about "the nature of the understanding" (T 1.4.1.5; SBN 181-82). But evidence about the "understanding" (e.g., evidence regarding our fallibility) has no bearing on our initial reasoning or the initial evidence. So whatever conclusion we reach in a corrective step, it cannot *change* an initial probability assignment:

> [Initial probability] assignments will be made on the basis of a body of relevant evidence, and higher-order reflections about our ability to make such assignments will not seep down to affect these assignments. (Fogelin, 19)

At best, corrective reasoning supplies a procedure for quantifying our uncertainty about the correctness of probability assignments. But our "corrective" judgments *about* initial assignments don't change those assignments. Thus, even where "probability" is understood as a subjective measure of assurance or confidence, it doesn't look like corrective reasoning can play the corrective role Hume supposes.

Louis Loeb (2002) takes a similar line and helpfully clarifies the supposed shift in subject-matter that gives rise to the objection. As Loeb understands it, corrective reasoning yields an estimation of the likelihood of error in an initial step, e.g., "that we are mistaken about 15 percent of the time" in cases like that of an initial judgment (228). Hume supposes this leads to a revision of the probability assigned to an initial judgment. As Loeb frames it, Hume's mistake is in failing to distinguish an initial degree of confidence, i.e., an initial probability assignment, from a degree of confidence *about* that initial assignment:

> Hume should distinguish his degree of confidence in [the initial judgment], his degree of confidence in that first-order degree of confidence, his degree of confidence in that second-order degree of confidence, and so on. At each of these stages, there is indeed a confusion of levels of probability. (229)

With this clarification, we can grant that corrective reasoning may leave us less than fully assured about the correctness of an initial probability assignment. But a second-order corrective judgment merely expresses our uncertainty *about* a first-order probability assignment. So rather than "correcting" an initial judgment, corrective reasoning leaves us with two independent judgments—an initial judgment about the object of our initial reasoning and a corrective judgment about that initial judgment.

No doubt Morris and Lynch are right about the difference between objective and subjective probabilities. But if Hume has confused two independent bodies of evidence and two independent judgments, then he mistakenly supposes that corrective reasoning diminishes, or leads to the revision of, initial probability assignments. Assuming that's right, Hume illicitly concludes that corrective reasoning reduces all knowledge to probability and all probability to nothing (T 1.4.1.1, 1.4.1.6; SBN 180, 182-83). So the more serious charge is that Hume is simply wrong in supposing the evidence for corrective reasoning is relevant for revising initial probability assignments.

VIII. A Reply to the More Substantive Objection

While the foregoing objection is stronger, it suffers from the mistaken assumption that probable reasoning is a mechanism for assigning probabilities to propositions. We've seen that interpreters tend to agree that past errors cause us to question the correctness of initial probability assignments, thereby prompting a corrective step. Viewed through this lens, corrective reasoning is seen as a procedure for evaluating the correctness of a probability assignment by assessing our fallibility or reason's reliability. But for Hume, probable reasoning is a procedure for making judgments about single events. Specifically, it's a procedure for determining what, if

anything, we ought to believe in the face of contrary evidence. Corrective reasoning is a special case of probable reasoning. Because the latter is not a tool for assigning probabilities to propositions, neither is the former.

What makes corrective reasoning a special case is the nature of the evidence that informs it. In standard cases of probable reasoning, we balance contrary evidence supplied by recalling things like arrival-times or the effects of aspirin-ingestion. With corrective reasoning, we balance *only* the contrary evidence supplied by recalling judgments reached by reasoning. This difference in the evidence explains why Hume says standard judgments are "deriv'd from the nature of the object" while corrective judgments are "deriv'd from the nature of the understanding" (T 1.4.1.5; SBN 181-82).

Hume contends that balancing the evidence from recollected judgments works to "correct and regulate" an initial judgment (T 1.4.1.5; SBN 181-82). As the foregoing objections make clear, corrective reasoning justifiably grounds the revision of an initial judgment only if the evidence balanced in a corrective step has some bearing on an initial judgment. Where a corrective reasoning is taken to be an assessment of our fallibility or reason's reliability, a corrective step simply changes the subject. We start with a worry about our initial judgment and then shift to a question about reason. On this picture, a corrective step leaves the initial evidence and our initial reasoning wholly unchanged—hence the charge that Hume has confused two independent bodies of evidence and judgments of differing orders.

The objection gets a foothold by assuming that corrective reasoning is an independent stage of reasoning where unrelated evidence is weighed. However, we've shown that correction is not an independent *stage* of reasoning but a further *step* in our initial reasoning. To make, accept, or stand pat with respect to an initial judgment is to presuppose the legitimacy of our

initial reasoning. Recollected errors in reasoning are direct evidence that this presupposition is false and indirect evidence that an initial judgment is wrong. For any judgment, evidence that it's wrong is relevant with respect to that judgment. Thus, the evidence from recollected judgments that is balanced in a corrective step has some bearing on any initial judgment.

Accordingly, to account for *all* relevant evidence with respect to an initial judgment, any initial step of reasoning must *continue* with a step of corrective reasoning. In a corrective step, our concern is whether an initial judgment has been reached by legitimate reasoning. Accordingly, an initial judgment is the object of our corrective reasoning, which means it informs our selection of evidence and supplies the preliminary assurance for our reasoning. Recollected judgments reached by legitimate reasoning are evidence that an initial presupposition of legitimacy is true while recollected errors are evidence that it's false. Balancing this contrary evidence fixes a degree of less than full assurance for an initial presupposition of legitimacy, which inevitably diminishes our initial assurance. Thus, corrective reasoning plays a corrective role because it is the *continuation* of our initial reasoning where additional relevant evidence is taken into account.

As Hume describes it, corrective reasoning works to expand the total body of evidence under consideration for an initial judgment. Rather than "moving up a level" to consider entirely unrelated evidence, corrective reasoning keeps us at "the same level" but introduces additional contrary evidence that inevitably diminishes our initial assurance. So Morris and Lynch are right to identify the purported effect of corrective reasoning as a diminution of initial assurance. But getting Hume right requires explaining diminution as the effect of introducing further evidence that has some bearing on our initial reasoning and initial judgments. Once we identify the presupposition targeted by Hume's skeptical arguments, we can see that he neither confuses

independent subjects nor runs-together different levels of assessment. Thus, in general, objections to correction and existing replies miss their mark by either taking a presupposition of legitimacy for granted or by mischaracterizing corrective reasoning.

- **Part 2: Inevitable Diminishment**

I. Questioning the Inevitability of Diminishment

Suppose I've convinced you that corrective reasoning plays a corrective role. Even so, there's room for questioning just what that role is. We've seen that Hume claims assurance for initial judgments inevitably diminishes as a result of corrective reasoning. When we think only about demonstrative judgments, this seems rather plausible. For instance, supposing that, at first blush, we're fully assured of a demonstrative judgment, there's no room for an increase of assurance. So if corrective reasoning has any impact on our assurance for demonstrative judgments, it would seem to be one of diminishment.

But admitting that assurance may well diminish in a corrective step is not the same as granting that it *must* diminish. And when we consider probable judgments in particular, the suggestion that a corrective step might increase assurance also seems rather plausible. After all, probable judgments are made with something less than full assurance. It's not unreasonable to suppose that our assurance for these judgments is at least sometimes too low. In such cases, "correction" ought to increase our assurance rather than diminishing it.

There are actually two ways to press this type of objection depending upon how we cast the aim of corrective reasoning.[9] What I'll call the "assurance approach," tells us that a corrective step is aimed at assessing the appropriateness of our initial degree of assurance. Since

[9] One way to understand the difference here turns on whether one identifies the degree of assurance for a judgment, the content of a judgment, or both as the outcome of probable reasoning.

our initial assurance might be judged to be inappropriately low, "correction" might sometimes require increasing our initial assurance. Alternatively, what I'll call the "judgment approach" suggests that in a corrective step we're assessing the correctness of an initial judgment. Where corrective reasoning leaves us nearly fully assured that an initial judgment is correct, our initial assurance shouldn't diminish and may well increase.

With the framework we've developed, we can show that neither approach poses a genuine challenge to Hume's claim of inevitable diminishment. The problem with both objections is that they assume there is some *favorable* evidence whose consideration might deliver an increase in assurance. But in presupposing the legitimacy of our reasoning, any evidence that might be favorable to an initial judgment is accounted for in an initial step. Consequently, there is no evidence whose consideration might produce an increase of assurance when weighed in a corrective step.

II. Assessing the Appropriateness of Initial Assurance

A probable judgment is made with less than full assurance as a result of balancing contrary evidence. Because it's grounded on contrary evidence, that a probable judgment has been reached by legitimate reasoning is no guarantee of its truth. So even if I've reasoned from the right evidence and in the right way, my arrival-time judgment might turn out to be false. Noting this "original uncertainty" of probable reasoning suggests that a worry about errors is not a worry about the content of our judgments—truth is too much to be hoped for (T 1.4.1.6; SBN 182-83). Instead, the best we can do with respect to the merely probable is attempt to make judgments with an appropriate degree of assurance.

The unavoidable uncertainty that characterizes merely probable judgments is one reason for thinking that a corrective step aims at evaluating our initial assurance. That correction is supposed to impact our initial assurance lends further support to this suggestion. Understood in this way, corrective reasoning is a procedure for assessing the appropriateness or correctness of an initial degree of assurance. Following Don Garrett (1997) we can understand "correctness" as a match between our initial assurance and the initial evidence (228). So when we worry about an error in probable reasoning, we're worrying that our assurance for a probable judgment is incorrect insofar as it fails to match the evidence.

Supposing that correction targets the appropriateness of our initial assurance opens the door for an objection to Hume's claim of inevitable diminishment. Reflection on past errors, so the objection goes, confirms that our initial assurance may be incorrect. But as Michael Lynch (1996) points out, this admission neither entails nor justifies a diminution in one's initial assurance:

> Errors in reasoning go both ways; sometimes we underestimate, sometimes we overestimate. Barring further evidence, there is no way of telling which I may have done in this situation. So, there is no reason to lower the original probability assignment…To put it another way, if one and the same reason supports both my having undercalculated and my having overcalculated, why should I feel less confident about my original belief? It would seem that I am back to where I started. (92-3)

According to Lynch, a recollected error is evidence that our initial degree of assurance may be inappropriate. But our initial degree of assurance may be inappropriately high or inappropriately low. In that case, it's unclear what should be done to "correct" for the possibility of error. If we

accept that "errors in reasoning go both ways," there doesn't seem to be a non-arbitrary way of deciding whether our initial assurance should increase or diminish in a corrective step.

Lynch proposes a way to break this apparent stalemate that accounts for the possibility that our initial assurance is too high *and* the possibility that it's too low in a single step. Rather than increase or diminish, the trick is to *widen the range* of the (subjective) probability assigned to an initial judgment. For instance, suppose that our initial reasoning yields a probable judgment *P* with a (subjective) probability or initial assurance of 0.8. Recollected errors confirm that the initial probability for *P* may be inappropriate. A degree of assurance is inappropriate when it is either too high or too low. It would be arbitrary to simply diminish or simply increase *P*'s probability on the basis of this evidence. Instead, we should widen the range of *P*'s probability from 0.8 to somewhere between 0.7 and 0.9. This widening reflects our uncertainty about an initial probability assignment while capturing the possibility that our initial assurance is too high *and* the possibility that it's too low. So following this procedure allows us to correct for both possibilities rather than arbitrarily favoring one over the other as Hume seems to propose.[10]

If we carry on with Lynch's procedure, the successive steps of correction forced by the Extinction Argument must be met with successive widenings of an initial probability assignment:

> [A]s we go through the argument, what we become less and less confident about is the belief that our initial assignment of subjective probability to P is correct. This loss of confidence to the effect that we were right the first time (that we didn't over- or underestimate) is precisely what forces us to widen the probability spread. (94)

[10] Something like Lynch's proposal is foreshadowed in Fogelin (1985) pp. 18-9. Bennett (2001) p.315 also entertains a version of this line of reply.

As this process continues, we'll eventually reach a corrective step where *P*'s probability will be judged to be somewhere between 0 and 1. But according to Lynch, this is just what it means to suspend judgment with respect to *P*:

> The more we widen it, the more apparent it becomes that we don't know how much confidence we should have in P; which in turn, leads us to not assign P any probability at all—we literally don't know what to believe. (94)

If Lynch has this right, we can capture Hume's claim of inevitable diminishment while offering a non-arbitrary response to the present objection. Successive widenings correspond to our mounting uncertainty regarding the appropriateness of an initial degree of assurance until we eventually suspend judgment—"a total extinction of belief" (T 1.4.1.6; SBN 182-83).

Unfortunately, there are two problems with Lynch's widening strategy. First, Lynch takes it that a recollected error gives us reason to worry that our initial assurance might be too low *and* a reason to worry that it's too high.[11] But if we suppose that errors in probable reasoning "go both ways," we should be able to distinguish those instances where our assurance was discovered to be too high from those where it was discovered to be too low. In that case, the widening strategy is superfluous. If on balance the evidence is that our initial assurance is too high, then our initial assurance ought to diminish in a corrective step. If on balance the evidence is that our initial assurance is too low, then our initial assurance ought to increase in a corrective step. While this doesn't address the specific challenge posed by the objection, it is a point against Lynch's reply.

The second problem, which I take to be an intractable one, is that Hume's account of probable reasoning cannot accommodate a widening strategy. I agree that we can make good

[11] Karlsson (1990) pp. 126-27, takes a similar line.

Humean sense of Lynch's final step, where the probability of *P* is thought to fall somewhere between 0 and 1. This fairly captures what it might mean to suspend judgment with respect to *P*. The problem comes in the intermediary steps required to get us there. What could it mean to alter one's assurance for an initial judgment from 0.8 degrees of full assurance to somewhere between 0.7 and 0.9 degrees of full assurance? For Hume, a degree of assurance is fixed by, and must vary with respect to, the evidence under consideration. Accordingly, to have *some* degree of assurance for a judgment is to have a *determinate* degree of assurance for that judgment. Insofar as Lynch's proposal requires giving this up, it fails to provide a viable Humean interpretation of diminishment and extinction.

An alternative reply to the assurance approach's objection comes from Don Garrett (1997).[12] Garrett begins by distinguishing what he calls a "felt" degree of probability from the correct or "actual" degree of probability. A felt degree of probability corresponds to our degree of assurance for an initial judgment. The actual degree of probability is whatever degree of assurance would follow from error-free reasoning so as to "match" the evidence (228).

According to Garrett, corrective reasoning is a procedure for assessing whether an initial judgment is "actually" at least as probable as it is initially "felt" to be (227). More simply, we're asking whether an initial degree of assurance might be too high. By asking this specific question, we restrict the unfavorable evidence to just those recollected errors where our assurance for a probable judgment was too high.[13] These recollected errors keep us from securing full assurance that our felt degree of probability just is the actual degree of probability. What's more, they confirm that our felt degree of probability may be higher than the actual

[12] This response was touched on in chapter 3, but a fuller examination follows.

[13] That is, any recollected errors where our assurance was too low will be excluded from the unfavorable evidence because they are examples of initial judgments that were actually *at least a probable* as they were initially felt to be.

degree of probability. In light of this evidence, it would seem that our initial assurance can only go down.[14]

Garrett takes this to show is that there is a plausible Humean procedure of corrective reasoning that must inevitably diminish our initial assurance. But supposing Garrett has this right, securing Hume's skeptical conclusions requires asking just the right question, viz., *whether our initial assurance might be too high*. Tellingly, Garrett concedes that changing the question delivers an alternative procedure that may well increase our initial assurance:

> But suppose we reflect instead that there is some probability that the original felt degree of probability was *too low* to match our evidence…This line of thought, it seems, would tend to *increase* our confidence in our original judgment. (228, Garrett's emphasis)

In that case, overturning Hume's skeptical conclusions is merely a matter of changing the question posed in a corrective step. While this looks to be a serious strike against the proposal, the foregoing admission is actually a first step in Garrett's defense of it.

Admitting that there may be an alternative corrective procedure that increases assurance does not show that the corrective procedure invoked by Hume fails to diminish it:

> [T]he fact—if it is a fact—that a second way of reflecting on the fallibility of our faculties would increase (or at least not lessen) our degree of belief in a judgment through the operation of reason does not entail that reason would not lessen our degree of belief *when operating in the way that Hume describes*. (228, Garrett's emphasis)

So one way to deal with the assurance approach's objection is to deny its relevance. At most, we're forced to admit the possibility of an alternative corrective procedure. But this is perfectly

[14] Garrett (2006) makes this procedure slightly clearer by saying that corrective reasoning yields less than full assurance that one's initial assurance "is not higher than the standard degree of assent" for an initial judgment (162).

consistent with the claim that Hume's procedure of corrective reasoning must inevitably diminish our initial assurance.

While Garrett's reply appears to defuse the objection, it actually emphasizes the supposed problem for Hume's claim of inevitable diminishment. If a corrective step is an assessment of the appropriateness of an initial degree of assurance, then evidence that it's too high *and* evidence that it's too low is relevant. On Garrett's interpretation, Hume is arguing that only the former type of evidence matters for corrective reasoning. While consideration of just this evidence yields the intended result, it does so by arbitrarily ignoring relevant evidence.

If we accept the possibility of an increase-procedure, then we're admitting the possibility of evidence that our initial assurance is too low. Accordingly, full consideration of the relevant evidence regarding the appropriateness of our initial assurance allows for variations in the outcome of corrective reasoning. Where the balance of evidence is that our assurance is too high, initial assurance diminishes in a corrective step. Where the balance of evidence is that our assurance is too low, initial assurance increases in a corrective step. Finally, where the evidence that our assurance is too high and the evidence that our assurance is too low are of equal weight, corrective reasoning leaves our initial assurance unchanged. I take it this is precisely the point the objection aims to press—*full consideration of all relevant evidence about the correctness of our initial assurance doesn't necessarily diminish our initial assurance*. Thus, rather than answering the objection, Garrett's proposal works to clarify the challenge it poses to Hume's claim of inevitable diminishment.

Answering the challenge from the assurance approach requires showing how it misunderstands Hume by misidentifying our initial assurance as the object of corrective reasoning. Indeed, this misunderstanding leads to the mistaken suggestion that errors in probable

reasoning go "both ways" so that our initial assurance is sometimes too high and sometimes too low. Of course we easily understand what it means to say that someone has overestimated or underestimated such that they are too confident or not confident enough in their judgments. But these turns of phrase don't translate into a Humean framework where degrees of assurance are fixed mechanistically by the evidence that is actually selected and balanced:

> As the belief, which we have of any event, encreases or diminishes according to the number of chances or past experiments, 'tis to be consider'd as a compounded effect, of which each part arises from a proportionable number of chances or experiments. (T 1.3.12.16; SBN 136)

In other words, with respect to the evidence actually considered, we end up with precisely the degree of assurance that we ought to have. Thus, because assurance is fixed by the evidence, any worry about the correctness of our initial assurance reduces to the worry that we've selected the wrong initial evidence.[15]

In the second chapter we saw that all errors in matter of fact reasoning are evidence selection errors. When we detect an error in probable reasoning, we discover that, due to "the irruption of other causes" such as distraction or confusion, we've reasoned from the wrong evidence (T 1.4.1.1; SBN 179). It may happen that we realize the selection of the right evidence

[15] Garrett parenthetically accepts the foregoing point about the mechanistic apportioning of assurance, but in an effort to understand errors in probable reasoning suggests that assurance might sometimes fail to match the selected evidence: "Normally, of course, Hume thinks that the [evidence] produces a precisely corresponding quantity of [assurance]. When this correspondence is not produced or maintained, 'the inconstancy of our mental powers' has prevented our probable reasoning from operating normally" (225). What we're imagining here is that, at least sometimes, consideration of the right evidence yields a judgment with the wrong assurance. This is just what it means to say that a "felt degree of probability" may be too low or too high to "match our evidence" (228). In the second chapter I said that even accepting that such an error is possible (which I doubt), it is unclear how it might be detected so as to be taken into consideration with corrective reasoning. But even setting this aside and granting that such an error is both possible and detectable, because the apportioning of assurance is not under our direct control, this would not be an error in reasoning. Instead, a failure of match between our assurance and the evidence is best described as a natural error rather than an instance where "our understanding has deciev'd us" (T 1.4.1.1; SBN 180).

would have delivered a probable judgment with the same content but more or less assurance. However, because the apportioning of assurance is not under our direct control, it is not the case that our error was in *giving* too little or too much assurance to our initial judgment. The worry pressed by recollected errors is not that our initial assurance is inappropriate but, rather, that we have reasoned from the wrong evidence. Consequently, the proposals from Garrett and Lynch turn out to be solutions to a problem that doesn't arise for Hume.

The upshot is that the assurance approach's objection, and any interpretation that identifies assurance as the target of correction, gets Hume wrong by mischaracterizing corrective reasoning. Since there are no Humean errors of overestimation or underestimation, there is no useful distinction between recollected errors that might justify an increase of initial assurance on the one hand and a decrease of initial assurance on the other. Once we recognize that probable errors are evidence selection errors, we see the strangeness of claiming that reflection on past errors might increase our initial assurance. After all, this would commit us to saying that our initial assurance may well increase from considering the possibility that we've reasoned from the wrong evidence. Thus, if there's a problem with Hume's claim of inevitable diminishment, it doesn't stem from assessments of the correctness of an initial degree of assurance.

III. Assessing the Correctness of an Initial Judgment

The judgment approach's objection takes a different route by supposing that the object of corrective reasoning is an initial judgment. Here the question is not whether our initial assurance is too low or too high but, rather, whether an initial judgment is correct with respect to its content. For instance, if I've forgotten that it's Labor Day weekend, I might select the wrong evidence and incorrectly judge that I'll arrive home at the normal time. Our recollected errors

prove that any initial probable judgment might be incorrect in this way. According to the judgment approach, it is this worry that prompts a corrective step,

Hume's claim of inevitable diminishment is hard to deny when we focus on just the evidence afforded by recollected errors, and Hume encourages this focus by summarizing the Extinction Argument with the following confession: "When I reflect on the natural fallibility of my judgment, I have less confidence in my opinions" (T 1.4.1.6; SBN 182-83). While reflecting only on past errors plausibly diminishes our initial assurance, Hume is unmistakably clear that in a corrective step we must also consider the countless times "wherein [reason's] testimony was just and true" (T 1.4.1.1; SBN 180). So the question is whether diminishment inevitable when we recall a "history of all those instances, wherein our understanding has deceiv'd us, *compar'd with those,* wherein its testimony was just and true" (T 1.4.1.1; SBN 180, my emphasis). According to the judgment approach, once *all* of the relevant evidence is taken into account, our initial assurance needn't diminish and may well increase.

One way to frame this challenge is with the following question: if weighing all relevant evidence leaves me nearly fully assured that my initial judgment is correct, why would my initial assurance diminish? It doesn't sound strange at all to say that our assurance for an initial judgment might increase when we determine that it's very likely grounded on the right evidence. It would be a far stranger claim to say a corrective step that leaves us highly confident that an initial judgment is correct must inevitably diminish our assurance for it. D. G. C. MacNabb (1951) makes something like this point by drawing precisely the opposite conclusion from Hume:

> [I]t seems evident to commonsense that the second-order judgement that I am very likely, though not certain, to be correct in some first-order judgement increases rather than diminishes the authority of that first-order judgement. (101)

If we suppose that something like this is right, then Hume overreaches by claiming that diminishment is the inevitable consequence of correction. Strictly speaking, assurance *may well* diminish in a corrective step, but it does not *necessarily* diminish.

I've tried to illustrate the judgment approach's strong intuitive appeal. Nevertheless, the objection misunderstands Hume's view. Any suggestion that our initial assurance might increase supposes that corrective reasoning is informed by two types of evidence, e.g., one that diminishes initial assurance and another that increases initial assurance. That two types of evidence inform corrective reasoning is right. One type is the favorable evidence from recollected judgments reached by legitimate reasoning. The other type is the unfavorable evidence from recollected judgments reached by illegitimate reasoning. The mistaken assumption shared by both the assurance approach and the judgment approach is that *favorable* evidence might increase our initial assurance.

Recollected judgments from legitimate reasoning are evidence that an initial presupposition of legitimacy is true. So they're evidence that we've reasoned from the right evidence and in the right way. Accordingly, recollected judgments from legitimate reasoning are evidence that we've made just the right judgment with just right degree of assurance. On the basis of this *favorable* evidence, an initial judgment shouldn't be changed in any way. Rather than increasing our initial assurance, favorable evidence tells us that any alternation of an initial judgment is unwarranted. Indeed, as we saw in chapter three, even where the evidence for corrective reasoning is *all* favorable such that we have a proof of legitimacy, our initial assurance

cannot increase. Thus, there is no evidence whose consideration might increase our initial assurance in a corrective step.

This takes care of why assurance cannot increase, but we still need to say why assurance must diminish. For this step, we need only grant Hume's assumption that the evidence in any corrective step must include at least one recollected error. In non-Humean terms, this means granting that for any judgment reached by reasoning, no matter how simple, it is always possible that we've made some error. Because the legitimacy of our reasoning is presupposed, the favorable evidence from recollected judgments is accounted for in any initial reasoning while the unfavorable evidence is not. Accordingly, any corrective step introduces unaccounted-for evidence that our initial reasoning is illegitimate and that our initial judgment is wrong. Balancing the favorable evidence against the unfavorable evidence establishes a degree of less than full assurance for an initial presupposition of legitimacy, thereby diminishing our assurance for any initial judgment. Thus, diminishment is the inevitable result of a corrective step that establishes a degree of less than full assurance for an initial presupposition of legitimacy.

We can make the same case in more Humean terms by recalling that an initial judgment is the object and foundation of our corrective reasoning. That means an initial judgment informs our selection of evidence and supplies the preliminary assurance for our corrective reasoning. In principle, the selected evidence could all be favorable such that we have a proof of legitimacy. Where the evidence is uniform, balancing fails to cancel any of the preliminary assurance supplied by an initial judgment. So where we have a proof of legitimacy, our initial assurance survives undiminished through a corrective step. This result captures what it means to say that legitimacy was rightly taken for granted insofar as *correction* neither increases nor diminishes our initial assurance.

But in practice, the evidence for corrective reasoning always includes at least one recollected error in reasoning. This unfavorable evidence must be apportioned some degree of the preliminary assurance from an initial judgment. As a result of balancing *contrary* evidence, a corrective step inevitably cancels some portion of the preliminary assurance supplied by an initial judgment. Then just in case we grant Hume's assumption that the evidence for corrective reasoning always includes a recollected error, assurance for an initial judgment inevitably diminishes in any corrective step. Thus, objections to Hume's claim of inevitable diminishment misfire by either misidentifying the target of corrective reasoning or by mischaracterizing the nature of the evidence for a corrective step.

IV. The Erosion of Evidential Grounds

Before moving on I need to more fully address a point of contention that was touched on in the last chapter. On my account, initial assurance diminishes because a corrective step weakens the evidential grounds for initial judgments. This interpretation is at odds with an influential view that tells us Hume's skeptical arguments make a psychological point rather than an epistemic one. On this reading, Hume's conclusion of a "total extinction of belief and evidence" is not a claim about justification or the belief-worthiness of our judgments. Instead, Hume is marking a feature of human cognition, for instance, that repeatedly reflecting on the possibility of error erodes confidence in our judgments.

David Owen (1999) argues for this non-epistemic reading but admits that it's "difficult not to think of [Hume's use] of 'evidence' here in an epistemological way" (185). However, Owen claims that if we succumb to this temptation we "misunderstand how Hume uses the term

'evidence'" (185). To get Hume right, we're told, requires interpreting "evidence" as "evidentness," e.g., the assurance we have for judgments.

As far as I know, Don Garrett (1997) is the forerunner of the evidentness reading, which he explains with the following:

> Hume does not use 'evidence' as a term of epistemic evaluation at all. On the contrary, he consistently uses it to mean "evidentness"—that is, as equivalent to "belief," "assurance," or "vivacity," construed as properties of ideas…In no case does he use the term 'evidence' to mean the belief-worthiness or support of a proposition, as opposed to its vividness or strength of assent. Thus, close examination of Hume's argument for, and terminology in, his conclusion [of an extinction of evidence] shows it to be a conclusion in cognitive psychology. (228)

Owen (1999) endorses the same reading but strengthens the claim by suggesting that we can't make sense of Hume's arguments if "evidence" is treated epistemically:

> [I]n most places, 'evidence' means some thing like 'evidentness'; that is to say, 'evidence' means just the same thing as 'assent' or 'conviction'…One can argue against reading 'evidence' as 'evidential grounds' in the following way. How could a subsequent judgment affect the original evidence, when 'evidence' is treated as 'evidential grounds', interpreted in terms of what justifies our belief? It is not as if the original evidence turns out to be false or misleading; it is just that it ceases to have the effect on us that it originally had. So we can say that what is weakened is either the assent itself or the causal efficacy of whatever it is that causes my assent. But in neither case does it have anything to do with what justifies the belief. (185)[16]

[16] Owen does grant that at least sometimes "evidence" means something like evidential grounds, but that this is not intended to mark what justifies judgments or beliefs: "It is true that in some instances, Hume uses 'evidence'

So when Hume says that corrective reasoning diminishes assurance, he is reporting a psychological fact about us—reflecting on our fallibility undermines our assurance for any judgment. In that case, the "extinction of evidence" just is the extinction of *evidentness*. Thus, only our assurance for judgments is successively weakened, not their evidential grounds.[17]

From what I've said so far, it will be unsurprising that I share Kevin Meeker's (2000) puzzlement regarding this interpretation: "if the evidential grounds are *not* weakened, then it is puzzling why our *confidence* should be weakened" (225, Meeker's emphasis). While interpreters like Garrett and Owen offer a fair characterization of the psychological effect of corrective reasoning, a Humean *cause* that explains diminishment is missing. For Hume, variations in assurance are explained by variations in evidential grounds. So if we agree that corrective reasoning diminishes initial assurance, we ought to agree that it does so by eroding the evidential grounds for our judgments. In strengthening the case for this interpretation, I'll continue to use the term "evidence" to mean "evidential grounds" while reserving "assurance" and "evidentness" to mean our degree of assent or confidence for a judgment.

As a starting point, Hume's distinguishing of the "several degrees of evidence" for demonstrative, causal, and probable reasoning is instructive:

> By knowledge, I mean the assurance *arising from the comparison of ideas*. By proofs [or judgments from causal reasoning], those arguments which are *deriv'd from the relation of cause and effect*…By probability, that evidence, which is still attended with

to refer to what causes in us the degree of assent we give to belief. In this sense, 'evidence' does mean something more like 'evidential grounds', but even in this case, 'evidence' does not mean 'what justifies us in the belief' so much as 'what causes us to have the degree of assent, i.e., force and vivacity, that we in fact have'" (Owen, 185).

[17] For other interpreters that advocate the evidentness reading see: Allison (2008), Garrett (1997), LoLordo (2000), Lynch (1996).

> uncertainty…[and] may be divided into two kinds, *viz.*, that which is *founded on chance*, and that which *arises from causes.* (T 1.3.11.2-3; SBN 124-25, my emphasis)

I grant that Hume is using "evidence" in this context to mean something like assurance. But importantly, he is explaining differences in degrees of assurance for each type of judgment by appealing to differences in their *evidential grounds*.

The evidential grounds from which the assurance of knowledge *arises* is a comparison of ideas. The evidential grounds from which the assurance of proof is *derived* is the relation of cause and effect, i.e., uniform past experience. The evidential grounds on which the less than full assurance of probable judgment is *founded* is the contrary evidence from past experience. So with respect to judgments from each type of reasoning, their differing degrees of evidentness are explained by differences in their evidential grounds.

Hume's skeptical arguments purport to show how assurance for an initial judgment is successively diminished in successive corrective steps. Corrective reasoning is a type of probable reasoning. According to Hume, in probable reasoning "we employ materials, which are of a mix'd and heterogeneous nature, and which, however connected, are yet essentially different from each other" (T 1.3.5.1; SBN 71). The "materials" that are "essentially different from each other" are a present impression and recollected events. A present impression supplies the preliminary assurance for our reasoning while recollected events supply the evidential grounds for our judgments.[18]

[18] Recall the following: "'Tis merely the force and liveliness of the perception, which constitutes the first act of the judgment, and lays the foundation of that reasoning, which we build upon it, when we trace the relation of cause and effect" (T 1.3.5.7; SBN 86). "In…[this] species of reasoning we commonly take knowingly into consideration the contrariety of past events; we compare the different sides of the contrariety, and carefully weigh the experiments, which we have on each side" (T 1.3.12.7; SBN 133). "[A]s past experience regulates our judgments concerning the possibility of these effects, so it does that concerning their probability; and that effect, which has been the most common, we always esteem the most likely" (T 1.3.12.8; SBN 134).

Fortunately, Hume is unmistakably clear as to how the contrary evidence fixes a degree of assurance for a probable judgment that is a "compounded effect":

> [W]herever any cause consists of a number of parts, and the effect encreases or diminishes, according to the variation of that number, the effect, properly speaking is a compounded one, and arises from the union of the several effects, that proceed from each part of the cause. Thus, because the gravity of a body encreases or diminishes by the encrease or diminution of its parts, we conclude that each part contains this quality and contributes to the gravity of the whole. *The absence or presence of a part of the cause is attended with that proportionable part of the effect.* This connexion or constant conjunction sufficiently proves the one part to be the cause of the other. *As the belief, which we have of any event, encreases or diminishes according to the number of chances or experiments, 'tis to be consider'd a compounded effect, of which each part arises from a proportionable number of chances or experiments*. (T 1.3.12.16; SBN 136, my emphasis).

In other words, just as "gravity" depends upon the "parts" of a body, so too the resultant assurance for a judgment depends upon its parts, viz., the evidential grounds afforded by a set of contrary evidence selected from past experience. Hence, variations in assurance must be explained by variations in evidential grounds.

The skeptical arguments are driven by Hume's claim that proportioning beliefs to all relevant evidence requires accounting for two bodies of relevant evidence that cannot be weighed in a single step of reasoning. For probable reasoning generally, and corrective reasoning in particular, we *knowingly* select and balance contrary evidence from past experience:

> In…[this] species of reasoning we commonly take knowingly into consideration the contrariety of past events; we compare the different sides of the contrariety, and carefully weigh the experiments, which we have on each side. (T 1.3.12.7; SBN 133)

While our assurance for probable judgments is fixed mechanistically by a balancing procedure, our assessments of our present circumstances and our selection of evidence is up to us. Accordingly, we're epistemically responsible for our probable judgments and our errors in probable reasoning.[19]

This helps to explain the normative nature of Hume's skeptical arguments against reason. It is epistemically irresponsible to knowingly ignore relevant evidence. A failure to continue our initial reasoning with a step of corrective reasoning is to knowingly *ignore* relevant evidence. So any initial step of reasoning must be followed by a corrective step:

> In every judgment, which we can form concerning probability, as well as concerning knowledge, we ought always to correct the first judgment, deriv'd from the nature of the object, by another judgment, deriv'd from the nature of the understanding…[O]ur sentiments have different degrees of authority, even with ourselves, in proportion to the degrees of our reason and experience. In the man of the best sense and longest experience, this authority is never entire; since even such-a-one must be conscious of many errors in the past. (T 1.4.1.5; SBN 181-82)

[19] Owen appears to accept this point but doesn't seem to think it impacts the non-epistemic reading: "Now it might seem that this mechanical production of belief as a result of the character of our past experience leaves us no power at all to proportion our beliefs in probable reasoning. They are proportioned for us, according to past experience. But we can make sure that our experience is inclusive of all the relevant sort of events. We can make sure that we concentrate on all the relevant circumstances, and not ignore relevant evidence. We can make use of general rules. We can reflect on past errors. We can check our memory against documentation. In short, we can vary the context in which beliefs arise" (216). I would only add that this is why Hume's point is a partially epistemic one rather than a purely psychological one.

Since we are always able to recall at least one relevant error, each corrective step adds contrary evidence to the "original" evidence. Successive additions of contrary evidence successively undermine the evidential grounds for an initial judgment. It is in this sense that each corrective step "must weaken still farther our first evidence" (T 1.4.1.6; SBN 182-83).

That changes in assurance follow from changes in evidential grounds reveals that Hume's concern in "Of scepticism with regard to reason" is at least partially epistemic rather than purely psychological. However, I agree with my opponents that assurance diminishes as a result of corrective reasoning and that Hume often means *evidentness* or assurance when he uses the term "evidence." But despite the pervasiveness of the evidentness reading, the interpretation cannot be sustained. Where diminishment is not understood as an effect produced by a change in evidential grounds, we fail to achieve a Humean account of the extinction of *belief* insofar as it is a *compounded effect* (T 1.3.12.16; SBN 136). Properly understood, the extinction of belief is caused by the extinction of evidential grounds, and the extinction of evidential grounds is facilitated by continual additions of contrary evidence. If we agree that initial assurance diminishes in a corrective step, as Garrett and Owen do, then we ought to agree that there is a Humean explanation of diminishment. The evidentness reading fails to supply this explanation. My interpretation provides this missing piece by showing that diminishment is the inevitable effect of corrective steps that successively weaken the evidential grounds for our judgments.

- **Part 3: The Extinction of Belief**

I. Questioning Hume's Extinction Claim

The most salient objections to Hume's skeptical arguments are those that challenge correction and the claim of inevitable diminishment. We've shown how these long-standing

objections overlook the presupposition targeted by Hume's skeptical arguments and mischaracterize the procedure of corrective reasoning that drives them. We'll now briefly consider two less substantive objections aimed at Hume's "extinction" claim. The first challenges Hume's assertion that "[n]o finite object can subsist under a decrease repeated *in infinitum*" (T 1.4.1.6; SBN 182-83). But on its own, Hume's claim of inevitable diminishment does not deliver this result. To secure extinction, Hume must make the further assumption that successive diminishments don't become successively smaller. If they do become successively smaller, even indefinite corrective steps won't deliver a *total* diminution of our initial assurance.

The second objection turns on a mathematical reading of corrective reasoning that supposes correction is facilitated by a multiplication procedure. Supposing that an initial judgment and a corrective judgment are each assigned a probability less than 1, then multiplying the probabilities together would seem to deliver the diminishment Hume anticipates. But no matter how many corrections are made in this way, some fraction of our initial assurance, i.e., the initial probability assignment, will always remain. In that case, while assurance may inevitably diminish in successive corrective steps, these successive diminishments can't deliver the extinction promised by Hume's argument. After working through each of these objections, we'll see how answering the first simultaneously delivers an answer to the second.

II. Two Objections to Extinction

Suppose we grant that corrective reasoning plays a corrective role and that each corrective step inevitably diminishes our initial assurance. Still, as Robert Fogelin (1985) notes, the extinction of assurance is not guaranteed unless we make a further assumption about the nature of the successive diminishments:

> [T]o decrease a quantity 'to nothing,' it must be shown that those diminutions do not approach zero as a limit…[for] we can imagine each diminution becoming progressively smaller such that the sum of the diminution approaches a finite limit. The total diminution could even be quite small. (Fogelin, 17)

The idea here is that in successive corrective steps, the amount of unfavorable evidence that is added might become smaller and smaller. In that case, the diminutions facilitated by each corrective step will also become successively smaller. Richard Dewitt (1985) illustrates how this allows for the possibility of denying that successive corrections deliver even a substantial diminishment of our initial assurance:

> Consider the number .99. Now decrease this number by .009. Take the new value and decrease it by, 0009, then decrease this value by .00009, then by .000009, and so on. Contrary to Hume's claim, here is a situation where the original value does indeed subsist under a decrease repeated *in infinitum*. Not only does the original value not approach a limit of zero, it in fact never falls below .98. (131)

Then unless we have good reason for supposing that "there is some finite limit below which the chance of error never falls," Hume is not entitled to the claim that successive corrective steps entail even a substantial diminution of our initial assurance let alone its total extinction (Fogelin, 17).

But suppose we grant that correction diminishes initial assurance and that successive diminishments don't become successively smaller. Even so, this isn't enough to secure the extinction of an initial judgment. To see why, suppose that probable reasoning is a mechanism for assigning numerical probabilities to judgments. Given the nature of the judgments, both an initial probable judgment and a corrective judgment must be assigned probabilities of less than

1.[20] According to Hume, an initial judgment is corrected once we have "adjusted these two" probabilities together (T 1.4.1.6; SBN 182-83). As Kevin Meeker (1998) notes, "elementary mathematics…tells us that when you multiply two real numbers that are less than one, you will always get a number lower than either value" (32). So following a multiplication procedure for "adjusting" two probabilities together would seem to deliver the promised diminishment.

But as Fred Wilson (1983) points out, a multiplication procedure cannot deliver the total diminution promised by Hume's argument:

> The limit of the series of probabilities is indeed zero, but we never actually reach that limit. All we ever reach is a fraction: indeed, if we go on long enough we can reach any fraction as small as we choose. Still, all we ever reach is the vanishingly small and not zero. (102)

So on a mathematical reading of probable reasoning, initial assurance cannot diminish to nothing as Hume supposes. Then it seems Hume is doubly mistaken in thinking that correction must substantially diminish initial assurance and that successive diminishments entail its total extinction.

III. Replies to the Objections to Extinction

Compared with the objections that came before, these are far less substantial worries. Indeed, regarding his own challenge to extinction Fogelin grants that "we will be in a perilous state if our only reply to Hume's argument depends upon rejecting any such minimal degree of possible error" (17). Wilson makes a similar point regarding the weakness of the second objection. Even if, strictly speaking, Hume overreaches by saying *extinction* follows from successive steps of correction, losing some of its bark takes little away from the argument's bite:

[20] I use the term "corrective judgment" to mark the judgment that is supposed to facilitate correction to yield a corrected initial judgment.

> "Vanishingly Small" will do as well as "zero" in undermining belief and evidence. Moreover, given that no mathematician of that age was ever clear on the distinction between zero and the vanishingly small, that is, on the nature of infinitesimals, it is a harsh judge indeed that will condemn Hume for a similar failure of understanding. (Wilson, 102)

While they don't pose especially worrisome challenges, we have the pieces in place to explain how these objections get Hume wrong.

One line of reply to the charge that corrective reasoning can't guarantee even substantial diminishment comes from Michael Lynch (1996):

> Whatever amount of doubt one starts with, no matter how small, there is no principled reason to lower that amount as the argument proceeds… [S]ince one's epistemic situation *vis à vis* one's own reliability does not change during the course of the argument (how could it?) then clearly one should have the same degree of suspicion towards one's reasoning all the way through. (96)

So one reason for thinking that diminishments don't become successively smaller is that we have no reason for supposing we become more reliable as our reasoning continues. Accordingly, we seem to have good reason for supposing that there is some "finite limit below which" the diminishments in each corrective step cannot fall.

While Lynch offers an intuitively compelling explanation for the failure of the first objection, in relying on a claim about our reliability it doesn't fit a Humean framework. A relatively minor complaint is that Lynch's proposal requires the additional assumption that our later steps of reasoning are at least as complicated as the earlier steps. Without this assumption, we might have good reason to suppose that our reliability changes as the argument proceeds. For

instance, if some steps are more or less complicated than others, then we may reasonably suppose that we will be more or less reliable with respect to those steps.

But all of that is rather beside the point since Hume's arguments don't call for assessments of our reliability. Instead, by calling on the contrary evidence afforded by recollected judgments, corrective reasoning targets a presupposition of legitimacy. What matters for the skeptical arguments is that, for any instance of reasoning, past experience supplies relevant evidence against a presupposition of its legitimacy. It's true that the amount of diminishment in any corrective step will depend upon the make-up of the set of contrary evidence. And Fogelin is right that a later step of corrective reasoning may well yield a smaller diminution than a previous step.[21] Fogelin is also right that if successive corrections are to guarantee substantial diminishment, Hume needs a further assumption. However, it's not the assumption that "there is some finite degree of probability below which the chance of error never falls" (17). Rather, Hume's assumption is that *a finite degree of assurance is not infinitely divisible*.

One way to express this is to say that there must be some minimum degree of assurance, which is the smallest possible degree of assurance that might be apportioned to a live possibility. Call this a "unit" of assurance.[22] For the sake of Hume's argument, we can suppose a unit of assurance to be 1*, or .1*, or .000001* or whatever number we choose. It doesn't matter *what* the smallest unit of assurance is, just *that* there is some smallest unit of assurance.

Given that the evidence for corrective reasoning must include at least one recollected error, at least one unit of assurance must be apportioned to that error in each corrective step.

[21] This result follows just in case there are fewer recollected judgments from illegitimate reasoning in the set of evidence for a later step of corrective reasoning than in the set of evidence for an earlier step.
[22] Compare this with Hume's staging of the discussion of infinite divisibility (T 1.2.1-5; SBN 26-65).

Balancing cancels rival possibilities and their apportioned assurance. So any corrective step must diminish at least two units of assurance. But correction and diminishment must continue indefinitely, and in some inevitable final step, a recollected error must strike a perfect balance with what remains of the initial evidence to yield a suspension of judgment. In this way, successive steps of correction and diminishment entail the total diminution of initial assurance. Thus, answering the first objection simultaneously delivers an answer to the second.

To suppose that diminishments get progressively smaller, as the first objection does, or that successive steps of correction inevitably leave a fraction of assurance, as the second objection does, is to rely on a mathematical interpretation of probable reasoning that is out of place in a Humean framework. Hume's skeptical arguments, and indeed all arguments that call for Humean probable reasoning, are not run by calculating and assigning mathematical probabilities to judgments. Likewise, Hume's corrective procedure in not one that relies on multiplication. Because each step of correction inevitably *cancels* at least two units of the preliminary assurance supplied by an initial judgment, successive steps will eventually deliver a total diminution of initial assurance.[23] Hence, both objections to Hume's extinction claim fail by misunderstanding Hume's account of probable reasoning and, thus, his account of corrective reasoning.

- **Part 4: Residual Questions and Alternative Interpretations**

I. The End of Corrective Reasoning and the Negation of an Initial judgment

While we've answered the three major types of objections leveled at Hume's skeptical arguments, some unanswered questions remain. For instance, why does corrective reasoning

[23] Again, so long as we accept Hume's assumption that, in any corrective step, the evidence must include at least one recollected error.

stop, as Hume seems to suppose? After all, any supposed final step of correction requires a presupposition of legitimacy, and our recollected errors in reasoning are evidence against this presupposition. Additionally, once assurance for an initial judgment is totally diminished, doesn't that mean we should have at least some degree of assurance for its negation? If corrective steps leave me with no assurance that I'll arrive home by 6:00 p.m., this would seem to imply that I have some assurance that I *won't* arrive home by 6:00 p.m. In these final sections, we'll address these residual questions before turning to consider what I take to be the central problem for alternative interpretations of this difficult section of Hume's *Treatise*.

II. The End of Corrective Reasoning

One might reasonably wonder why corrective reasoning stops with the extinction of an initial judgment. For any step of corrective reasoning we have relevant evidence that a presupposition of its legitimacy is false. So following any step of corrective reasoning, including the step that totally diminishes our initial assurance, relevant evidence remains to be considered. In that case, corrective reasoning should not only continue, it should continue *indefinitely*.

At first glance, this may not seem to be a genuine problem since we're granting that the Extinction Argument reaches its infamous conclusion. However, the continuation of corrective steps may well offer a path toward restoring our initial assurance. It's at least plausible that evidence against a presupposition of legitimacy for some final corrective step would be grounds for renewed confidence in an initial judgment. My interpretation affords a clear answer to why corrective reasoning can't restore initial assurance and, what's more, why corrective reasoning can't continue.

First, we've already shown that there is no favorable evidence whose consideration might increase or restore initial assurance by way of a corrective step. Second, once our initial assurance is totally diminished, we lack the requisite materials for continued reasoning. Recall that the necessary foundation of probable reasoning is a present impression that supplies the preliminary assurance for our reasoning:

> Were there no mixture of any impression in our probable reasonings, the conclusion wou'd be entirely chimerical…'Tis therefore necessary, that in all probable reasonings there be something present to the mind, either seen or remember'd; and that from this we infer something connected with it, which is not seen nor remember'd. (T 1.3.6.6; SBN 89)

In corrective steps, the preliminary assurance for our reasoning is supplied by an initial judgment. But in each step of corrective reasoning, some portion of this assurance is canceled as a result of balancing contrary evidence. Once our initial assurance has been totally diminished, the source of preliminary assurance needed for continued reasoning is gone. Thus, corrective reasoning doesn't continue because it can't continue.

We've seen how objections like those from Fogelin (1985) and Loeb (2002) misfire by treating correction as an independent and unrelated stage of reasoning. However, interpreters sometimes mount a defense of Hume with a similar strategy by proposing a relevant link between second-order corrective judgments (and third-order, etc.) and initial judgments. For instance, David Owen's (1999) embedding approach is a defense of this sort. In addition to the problems already uncovered for these interpretations, proposals that rely on nested judgments to facilitate diminishment can't give a principled reason for why corrective reasoning should ever stop. To show why, I'll focus on Don Garrett's (2006) account of correction and diminishment.

Garrett argues that from the formation of successive corrective judgments, where a later one expresses a doubt about the previous one, doubts are transmitted down a chain of judgments to successively diminish assurance for some first judgment (161-63). Each corrective step aims to account for the specific possibility that our assurance for a preceding judgment is not too high. After making an initial judgment, Garrett (2006) supposes we engage in corrective reasoning and that this yields "a second judgment, which is (of course) *held with its own actual degree of assent*" or assurance (162, my emphasis). The content of this second judgment is (roughly) that *The degree of assurance for the first judgment is not too high*.[24] Since we must be less than fully assured that our first assurance is not too high, "the occurrence of [this second judgment] will lower the actual degree of assent [for the first judgment]" (Garrett, 162). Garrett's suggestion here is that assurance for a first judgment naturally diminishes from the formation of this second judgment given (a) the content of the second judgment, and (b) the fact that it must be made with less than full assurance. We can put this by saying that the doubt reflected in the second judgment is transmitted to the first judgment, thereby diminishing our assurance for it.

But of course we can't be sure that our assurance for this second judgment is not too high. To account for this possibility we must make a third judgment, which will be held with its own degree of assurance. The content of this third judgment is (roughly) that *The degree of assurance for the second judgment is not too high*. Given its content and the fact that it must be made with less than full assurance, the formation of this third judgment diminishes assurance for the second judgment and, thus, further diminishes our first assurance. Because we can't be sure

[24] Garrett (2006) puts this by saying that the "actual" degree of assurance might exceed the "standard" degree of assurance for judgments like our initial judgment. So with corrective reasoning we're evaluating our actual degree of assurance for an initial judgment, which yields a second judgment that the "Degree of assent [for my initial judgment] is not higher than the standard degree of assent [for my initial judgment]" (162). For the sake of simplicity I'll continue saying, as I do above, that this second judgment made with its own degree of assurance is that "The assurance for the first judgment is not too high."

that *any* corrective judgment is made with a degree of assurance that is not too high, we're forced to successive corrective steps. And because the formation of any later judgment transmits diminishment to the first link in the chain of judgments, we must eventually reach a step that entirely diminishes our first assurance (Garrett, 161-3).

In explaining extinction, Garrett endorses something like what I set out above regarding a unit of assurance:

> Since Hume holds that the original actual degree of assent to [a first judgment] is a finite quantity of liveliness and that there is a finite minimum quantity of liveliness lost in any diminution of it, he concludes that a finite series of diminutions would entirely exhaust the assent to any judgment. (163)

I grant that we can make sense of Hume's extinction claim on Garrett's interpretation. That is, we're able to understand why assurance for a first judgment should totally diminish as a result of successive corrections. But in addition to mischaracterizing Hume's corrective procedure, there are two further problems with Garrett's proposal.

First, by establishing an ascending chain of judgments, each with its own degree of assurance, the total diminishment of our first assurance is not "a total extinction of belief and evidence." To facilitate diminishment through a chain of judgments, we must preserve a degree of assurance for each corrective judgment in the chain. After all, if assurance for a second judgment is totally diminished prior to the extinction of the first, the chain would be broken and the first judgment would be safe from further diminishment. Then to ensure the extinction of a first judgment, we must retain some degree of assurance for each corrective judgment in the chain. Understood in this way, "extinction" is actually just the loss of a single judgment in a

chain of many judgments, each made with its own degree of assurance. But if that's right, then on Garrett's reading there's no principled reason why correction should stop.

This raises a second problem for Garrett's proposal. Among the survivors is the judgment that *The degree of assurance for the first judgment is not too high*. Once our first assurance is totally diminished, this second judgment amounts to a proof. In other words, if we have *no* assurance for a first judgment, then surely our assurance for it is not *too high*. With the total diminishment of a first judgment, we can't be wrong about the second. And if we can't be wrong about the second judgment, then we can't be wrong about the third, or the fourth, and so on. Thus, not only would many judgments survive on Garrett's proposal such that corrective reasoning must continue, it appears the surviving judgments would amount to proofs attended with full assurance.

Similar to what we found with the objections from Fogelin and Loeb, the problem with a Garrett-style defense is that it supposes corrective steps yield independent judgments with their "own actual degree of assent" (162). Corrective steps are the continuation of our initial reasoning, so an initial judgment is the object and foundation of our corrective reasoning. As such, an initial judgment informs our selection of evidence and supplies the preliminary assurance for our reasoning. Once our initial assurance has been totally diminished from successive corrective steps, there are no judgments left to correct and no assurance left to ground further reasoning. Thus, corrective reasoning cannot continue beyond the extinction of an initial judgment.

III. Extinction and Negation

Apart from whether and how the Extinction Argument delivers extinction, philosophers have been puzzled by a further possibility. Suppose that the Extinction Argument makes good

on its promise such that "nothing of the original probability" survives (T 1.4.1.6; SBN 183-83). On a mathematical reading of this conclusion, successive corrective steps ultimately yield a probability of 0 for an initial judgment. From a contemporary point of view, that means the probability for an initial judgment's negation must be 1. Read in this way, the extinction of an initial judgment would entail full assurance for its negation.

Notice that we can capture the spirit of this worry while setting aside the mistaken mathematical reading. All we need to do is suppose that variations in assurance for an initial judgment correspond to variations in assurance for its negation. In that case, zero assurance for an initial judgment entails full assurance for its negation. Jonathan Bennett (2001) points to this implication as a reason for rejecting the foregoing proposal:

> [I]f the argument were supposed to lead to Prob(P) = 0, that is equivalent to absolute certainty that not-P, and nothing in the tone and atmosphere of iv.1 is friendly to that. Hume says that the argument threatens the total extinction 'of belief', not 'of the belief in P'; and later he speaks of it as enjoining one to 'look upon no opinion even as more probable or likely than another'. (315)

However, rather than conflicting with Hume's purpose, Fogelin (1985) suggests it yields a paradox that Hume may well have appreciated:

> If…we interpret [Hume's conclusion] to mean that the assigned probability must ultimately reach 0, we get the surprising result that the negation of the original proposition must reach 1. Of course, reasoning in this way will quickly generate a paradox, for we can start over again and reduce the probability of the negated proposition to 0. Perhaps Hume would have enjoyed this ingenious paradox, but I see no hint of it in the text. (174, fn. 5)

Whether or not Hume would have appreciated this result, interpreters agree that it is not the result he takes himself to have secured. But something more needs to be said in order to show why reading the argument this way gets Hume wrong.

To allay Bennett's worry (or perhaps exacerbate it), even if we suppose that variations in assurance for an initial judgment correspond to variations in assurance for its negation, it's not clear that this is an objection to Hume's conclusion. It *appears* to be a problem only if we leave off consideration of the negation until some final corrective step. But taking the proposal seriously means that assurance for the contradictory judgments must continually vary as the Extinction Argument proceeds. If that's right, then at some midpoint they ought to strike a perfect balance. In other words, there must be some particular corrective step where we have an equal degree of assurance for an initial judgment and its negation. But if that's right, this would seem to require precisely the suspension of judgment promised by Hume's argument.

William Morris (2000) offers an interpretation along these lines, suggesting that as our assurance for an initial judgment diminishes, our assurance for its negation increases:

> As I work through the iterated assessments of my probability claim, and recognize that with each step the probability diminishes, I may think that the likelihood that the opposing belief—the negation of my original judgment—increases. But I'm required to apply the same critical scrutiny to that assessment, for it too is an assessment of probability. Eventually, confusion reigns. I'll have no substantial reason for believing that either assessment is correct. If I'm reasonable, I'll suspend judgment. But that is just what it is to reduce a belief to 'nothing.' (104)

Though he doesn't say so explicitly I take it that Morris must mean that, at some point in the Extinction Argument, we'll reach a step where competing but contrary expectations eventually

yield a suspension of judgment. So it's not the case that the extinction of an initial judgment leads to any degree of assurance for its negation.

Outside of a Humean context this proposal offers a plausible way to understand how successive doubts might yield a suspension of judgment. But within a Humean context the assumption that assurance for judgments and their negations co-vary is misplaced. We've seen that assurance for an initial judgment is fixed by the selected evidence and diminished through successive additions of contrary evidence. Importantly, diminishment is not facilitated by taking on positive evidence in support of the negation of an initial judgment. For any initial step of probable reasoning, a set of *contrary* evidence is selected and balanced such that contrary possibilities cancel. Accordingly, any direct evidence in *support* of an initial judgment and any direct evidence *against* it is balanced in an initial step. So any positive evidence for an initial judgment's negation, i.e., any evidence in support of a contrary possibility, is accounted for in an initial step of reasoning. Hence, once an initial step of reasoning is completed, there is no unaccounted-for evidence that might ground a belief in the negation of an initial judgment.

On Morris' proposal, we're assuming that corrective reasoning results in two competing sets of evidence that ground probable judgments of contrary types. But to get Hume right we need to carefully distinguish between (i) sets of evidence that ground probable judgments, and (ii) sets of evidence that fail to ground probable judgments. A set of contrary evidence grounds a probable judgment only if it includes a probability in Hume's second sense, that is, only if a majority of the evidence is made-up of live possibilities of the same type. In that case, at least one live possibility of that type and its apportioned assurance survives balancing. On the other hand, where a set of contrary evidence doesn't include a probability balancing cancels the contrary possibilities to yield a suspension of judgment.

For the Extinction Argument, the contrary evidence balanced in an initial step of reasoning grounds an initial probable judgment. Given contrary evidence in past experience, we're forced to successive steps of corrective reasoning, which is a type of probable reasoning. Successive corrective steps are met with successive additions of contrary evidence supplied by recollected judgments from reason. Eventually, these successive additions yield a body of evidence that fails to ground any judgment whatsoever. Thus, from successive additions of contrary evidence, the Extinction Argument *turns* a set of evidence that initially grounds an initial judgment into a set of evidence that fails to ground any judgment whatsoever.

But even after suspending judgment about, for instance, my arrival-time, I nevertheless recognize that arriving home by 6:00 p.m. is presently a live possibility. Consequently, it's not the case that I believe I *won't* arrive home by 6:00 p.m. Likewise, suspending judgment about whether heads will turn up on a given coin toss does not entail believing that heads won't turn up. In other words, suspending judgment about which *type* of live possibility in a set of contrary possibilities will presently be actualized does not entail denying their status as live possibilities. Like the evidence for judging the outcome of a fair coin toss, successive steps of correction and diminishment eventually yield a set of contrary possibilities that are equally balanced so as to produce a suspension of judgment. Thus, it is not the case that having no assurance for an initial judgment entails any assurance for its negation, let alone *full assurance*.

IV. Alternative Interpretations

While the focus of this chapter has been on objections to Hume's skeptical arguments, addressing them has given us the chance to consider some defenses as well. What I hope to have shown is that, regardless of whether they think the arguments succeed or fail, interpreters have

misunderstood the corrective procedure that is supposed to deliver Hume's skeptical conclusions. As a result, both objectors and defenders share mistaken assumptions about how the arguments in "Of scepticism with regard to reason" are meant to unfold.

Part of the reason that correction has been misunderstood is that the presupposition targeted by Hume's arguments has been overlooked. Because of this, interpreters have misidentified the impetus and evidence for corrective reasoning. As we've seen, commentators often put human fallibility at the center of their explanations of corrective reasoning. For instance, Michael Lynch (1996) remarks that correction is driven by an "awareness of our fallibility" (91). Francis Dauer (1996) tells us that, because initial judgments depend on "our fallible faculties, we must assess their reliability" (213). Robert Fogelin (1985) makes the same point, remarking that a corrective step is an "assessment of the reliability of our faculties" (16). Taking a similar line, Don Garrett (1997) says that correction is a way of "reflecting on the fallibility of our faculties" (228).[25] Kevin Meeker (2000) describes corrective reasoning as a "careful consideration of our fallibility" (224). Antonia LoLordo (2000) says that correction is a call for "critical reflection on our faculties" (433). David Owen (1999) gives a similar treatment, noting that corrective reasoning targets "our fallible faculties [which] require a check to ensure they are working properly" (180). Regarding the outcome of a corrective step, William Morris (1989) suggests it delivers a reasoner's "assessment of himself as a fallible intellect" (47).

So whether interpreters are friendly to the arguments or not, Hume is usually understood to be arguing that corrective reasoning is prompted by our fallibility and aims at assessing the reliability of our faculties. When interpreters suggest that corrective reasoning is a procedure for

[25] Garrett is describing the Diminishment Argument. But in setting up the Degeneration Argument he seems to favor something far closer to what I've proposed by describing corrective reasoning with respect to initial demonstrative conclusions as a matter of weighing past "successes and failures" of demonstrative reasoning (223).

judging the reliability of our faculties, they encourage a shift in focus from an initial judgment to the reasoner, or perhaps, reason itself. Morris (2000) makes this especially clear when he says that in correcting a demonstrative judgment "it is my state I'm assessing, not the abstract calculation" (103). This mischaracterization of corrective reasoning is partially accounted for by confusion over *what* Hume is asking us to evaluate in a corrective step.

The call to focus on the reliability of reason or the fallibility of our faculties is not unfounded given Hume's opening remarks in "Of scepticism with regard to reason":

> In all demonstrative sciences the rules are certain and infallible; but when we apply them, *our fallible and uncertain faculties* are very apt to depart from them, and fall into error…Our reason must be consider'd as a kind of cause, of which truth is the natural effect; but such-a-one as by the irruption of other causes, and *by the inconstancy of our mental powers*, may frequently be prevented. (T 1.4.1.1; SBN 180, my emphasis)

Because he encourages us to reflect on our "fallible and uncertain faculties," it's reasonable to suppose Hume intends this reflection to play a central role in corrective reasoning. However, Hume's opening remarks are meant to indicate *why* a corrective step is needed rather than *what* is assessed in a corrective step.

By calling attention to our fallible faculties and inconstant mental powers, Hume is identifying potential *causes* of our errors in reasoning. In identifying causes that operate *contrary* to reason, Hume is offering a philosophical explanation for our experiences of reason's contrary effects:

> The vulgar, who take things according to their first appearance, attribute the uncertainty of events to such an uncertainty in the causes, as makes them often fail in their usual influence…But philosophers…find that 'tis at least possible the contrariety of events may

> not proceed from any contingency in the cause, but from the secret operation of contrary causes. This possibility is converted into certainty by farther observation, when they remark, that upon an exact scrutiny, a contrariety of effects always betrays a contrariety of causes, and proceeds from their mutual hindrance and opposition. (T 1.3.12.5; SBN 132)

Simply put, philosophers explain a contrariety of events by appealing to contrary causes, and Hume's opening remarks in "Of scepticism with regard to reason" are an explanation of this sort. Contrary causes such as distraction, confusion, inattention, and complexity frequently keep us from reasoning legitimately and, thus, account for our contrary experiences of reason's effects.

However, in marking potential causes of error, Hume is not suggesting that our fallible faculties are the object of corrective reasoning. Rather, a corrective step is *necessary* because, thanks to our fallible faculties, reason is a cause attended by contrary effects. As such, any conclusion from reason is uncertain by the lights of past experience. And despite our differences in *explaining* contrary effects, our *reasoning* concerning them is the same. In other words, the vulgar and the philosophers make the same kind of "inferences" from a contrariety of events:

> [H]owever philosophers and the vulgar may differ in their *explanation* of the contrariety of events, their *inferences* from it are always of the same kind, and founded on the same principles. (T 1.3.12.6; SBN 132-33, my emphasis).

So it doesn't matter whether we explain the contrary effects of reason by saying, as the vulgar might, that reasoning sometimes goes awry or, as philosophers might, that reasoning sometimes goes awry due to our fallible faculties. What matters is that, *given* reason's contrary effects, a corrective step requires selecting and balancing a set of contrary evidence from past experience:

> We must, therefore, in every reasoning form a new judgment, as a check or controul on our first judgment or belief; and must enlarge our view to comprehend a kind of history of all

> the instances, wherein our understanding has deciev'd us, compared with those, wherein its testimony was just and true. (T 1.4.1.1; SBN 180)

By focusing on a reasoner rather than past experience, commentators turn away from the *evidence* that Hume says must inform corrective reasoning and turn toward potential *causes* of error. As a result, they misidentify the object of corrective reasoning as human fallibility rather than an initial judgment. Thus, alternative interpretations tend to mischaracterize the arguments in "Of scepticism with regard to reason" due to misunderstanding the nature of a corrective step.

V. Conclusion

We've come a long way. By now it's clear why the first step to getting the arguments in "Of scepticism with regard to reason" right is getting Hume's account of single-event probable reasoning right. Unless we understand Hume's balancing procedure, we're bound to misunderstand the corrective procedure that drives the skeptical arguments. What's more, unless we're clear on what an error in reasoning is for Hume, we can't understand the nature of the evidence that informs *corrective* reasoning. However, in taking these necessary steps we've identified the presupposition targeted by the skeptical arguments, which has allowed us to draw out Hume's general strategy in "Of scepticism with regard to reason."

In general, we've reasoned as we should just in case our judgments are fully proportioned to all and only the relevant evidence. To accept any judgment solely on the basis of our present reasoning is to presuppose that it has been reached by legitimate reasoning. But reflection on past judgments reveals a "contrariety of events" that marks *all reasoning* as a philosophical source of uncertainty (T 1.3.12.4; SBN 131). As such, *all* judgments from reason are subject to correction and diminishment. So, in practice, proportioning judgments to all relevant evidence

requires continuing any initial step of reasoning with successive corrective steps. Thus, reasoning responsibly and accounting for all relevant evidence ushers in the extinction of all knowledge and belief.

While we've covered a lot of ground, we're barely halfway through Hume's "Of scepticism with regard to reason." So far we've addressed only the first two pages, which leaves just over two pages to go. Indeed, many questions remain, even about this new interpretation. For instance, we haven't considered what it tells us about Hume's skepticism or how it might explain why, "tho' [we] can find no error in the foregoing arguments," we continue to "believe, and think, and reason as usual" (T 1.4.1.8; SBN 183-84). Nevertheless, by showing how the skeptical arguments work and that they're successful within a Humean framework, we've achieved what we set-out to do. The remainder of the work must be left to another time.

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