

Hume's Incredible Demonstrations

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Abstract: Commentators have rightly focused on the reasons why Hume maintains that the conclusions of skeptical arguments cannot be believed, as well as on the role these arguments play in Hume's justification of his account of the mind. Nevertheless, Hume's interpreters should take more seriously the question of whether Hume holds that these arguments are demonstrations. Only if the arguments are demonstrations do they have the requisite status to prove Hume's point—and justify his confidence—about the nature of the mind's belief-generating faculties. In this paper, I treat Hume's argument against the primary/secondary quality distinction as my case study, and I argue that it is intended by Hume to be a demonstration of a special variety.

1. Introduction

In this paper, I will argue that Hume holds there are demonstrations—sound arguments with necessary premises—that have conclusions that *cannot* be believed. I will also argue that Hume maintains that some of these incredible demonstrations have conclusions that *cannot* be known. Thus, it is my contention that Hume holds that we can demonstrate necessary truths that are *neither knowable nor believable*.

My case study will be the main argument from section 1.4.4 of Hume's *Treatise*, which concludes that if our perceptions of colors, sounds, tastes, and smells could not be perceptions of mind-independent things, then our perceptions of bodies could not be perceptions of mind-

independent things. This is Hume's argument against the primary/secondary quality distinction that he adapts from Berkeley. Hume asserts that if those of us who believe that *only* our mental states instantiate "sounds, colours, heat, cold, and other sensible qualities" were to believe the conclusion of this argument, then they would not believe in the mind-independent existence of bodies. Hume is well aware that no one's beliefs are extinguished by this argument. Hume is confident that we still believe in the mind-independent existence of bodies after evaluating his argument, regardless of our take on it. On my interpretation, this is not because Hume holds that the argument is inferior in any way; indeed, as stated above, I will argue that Hume maintains that it is a demonstration, and he holds that demonstrations are the gold standard, in that they are sound arguments with necessary premises. And it is not because we cannot, or do not, conceive its premises or conclusion. Rather, we cannot believe on the basis of this argument because the faculties of the mind responsible for our beliefs generate stable opposing beliefs and, furthermore, those faculties are not recruited to evaluate its soundness. The activity of the faculty that evaluates the soundness of the argument from T 1.4.4 can, at most, temporarily dazzle us by slowing our use of our belief-generating faculties.¹ As Hume writes in an endnote of the first *Enquiry*, we experience "momentary amazement and irresolution and confusion" (EHU 12.15).² Yet, as soon as we leave the seminar room or our offices, our beliefs in the mind-independent existence of bodies rush back into our consciousnesses.

Throughout much of his writings, Hume develops and refines his account of the mind, including his account of what beliefs are and how they come to exist. Contrary to many of his predecessors, Hume argues that reason or the understanding—the faculty of the mind responsible for constructing and evaluating philosophical arguments—does not generate beliefs at all (see T 1.3.6, and especially 1.3.6.4–12).³ Hume argues that we can come to believe propositions *only* in

cases where they express claims suitably related to observed causal regularities (with testimony being an important variety of effect) or, as in the case of those impressed upon us by educators, where they have repeatedly appeared in the mind (T 1.3.9.16).⁴ Indeed, regarding the latter, Hume reports “I am persuaded, that upon examination we shall find more than one half of those opinions, that prevail among mankind, to be owing to education” (T 1.3.9.19). The imagination is the faculty at work in both causal and repetitive cases. So, while the set of believable propositions includes philosophical claims, we can come to believe them only if they meet these conditions and thus the imagination arrives at them.

Although Hume supports his account of the mind with arguments and examples, it is not until he considers a variety of “*sceptical and other systems of philosophy*” that he sees himself as truly putting it to the test.⁵ Hume labels these philosophical systems “sceptical” because their constituent arguments have conclusions that cannot be believed (see T 1.4.1.7, 1.4.1.12, 1.4.2.1, 1.4.2.50, 1.4.2.57, and 1.4.7).⁶ They do not feature in causal regularities of the sort sufficient to generate belief, and repeating them in the mind does not generate belief in them. Hume thinks there is no better way of putting his account of the mind to the test than by using it to explain our lack of belief in the conclusions of these skeptical arguments.

Commentators have rightly focused on the reasons why Hume maintains these arguments’ conclusions are not believed, and on the role these arguments play in Hume’s justification of his account of the mind. Here is Donald C. Ainslie:

[P]art of Hume’s goal in his explorations of skepticism in Sections 1 and 2 of Part 4 [of Book 1 of the *Treatise*] is to show that only his model of the mind can make sense of our experiences in reaction to sceptical challenges. Although there is “no error” (T 1.4.1.8) in these arguments, no one actually believes them. As we shall

see, he claims he can explain this disbelief as resulting from reflection's "so disturb[ing] the operation of my natural principles" (T Intro. 10) as to undermine both the argument and the capacity it challenges. We merely create temporary confusion in ourselves, of a kind most vividly described in [the] climax [of part 4], when we address our core tendencies to believe. But his philosophical opponents have modelled the mind so that we should be able to accept the sceptic's conclusions. Our experience with disbelief is evidence against their models.⁷

Nevertheless, Hume's interpreters have made a mistake in failing to take seriously the question of whether Hume holds that these arguments are demonstrations.⁸

This is a mistake for two reasons. First and foremost, if the skeptical arguments that Hume presents are *not* demonstrations because they are invalid and/or because their premises are subject to countervailing evidence (or otherwise open to justifiable doubt), then Hume's case for his account of the mind is severely weakened, supposing, as I do, that an interpretation like Ainslie's is correct. After all, if the skeptical arguments suffer from one or more of these inferiorities, then we are left to infer that they are the best explanation of why the mind does not believe the conclusions of the arguments—especially if we, like Hume's predecessors, defend an alternative account of belief formation.⁹ Only if the arguments are demonstrations can their existence be the decisive evidence Hume takes them to be for his descriptive psychological view about the nature of the mind's belief-generating faculties. As Hume asserts, unlike other arguments, demonstrations are decisive:

'Tis not in demonstrations as in probabilities, that difficulties can take place, and one argument counter-ballance another, and diminish its authority. A demonstration, if just, admits of no opposite difficulty; and if not just, 'tis a mere

sophism, and consequently can never be a difficulty. 'Tis either irresistible, or has no manner of force. To talk therefore of objections and replies, and ballancing of arguments in such a question as this, is to confess, either that human reason is nothing but a play of words, or that the person himself, who talks so, has not a capacity equal to such subjects. (T 1.2.2.6)

Second, if these skeptical arguments *are* demonstrations, then the import of Hume's position increases significantly. From Aquinas to Descartes, predecessors in the Aristotelian tradition maintain that demonstrations *necessitate* belief in their conclusions.¹⁰ If one carries out a demonstration, one believes its conclusion. Since Hume's antecedents also argue that many important philosophical theses can be demonstrated, Hume's position undermines this longstanding picture of the power of philosophy.¹¹ Hume dismisses the view that, in any case, "the difference betwixt believing and disbelieving any proposition" is whether it is conceived—an honor that the contraries of demonstrable propositions lack in being inconceivable—since for any non-demonstrable proposition, both it and its contrary are conceivable (T 1.3.7.3).¹²

So, while many philosophers are familiar with the fact that Hume's skeptical arguments play the aforementioned role in his broader project, this fact is consistent with the arguments being inductive, abductive, or of some other variety. It is also consistent with the universally held view that Hume maintains that all demonstrations generate knowledge. Yet, as I will argue, Hume holds that the argument from T 1.4.4 is as unable to generate knowledge as it is to generate belief.

Exploring Hume's account of the mind helps us better understand the implications of his views about the inability of reason to generate attitudes towards philosophical views. In general, the possibility that Hume's arguments are demonstrations and yet have unbelievable and unknowable conclusions poses a challenge to philosophers more broadly: what attitude can we and

should we take towards arguments whose conclusions we cannot accept but whose flaws we cannot discover? If a position like Hume's is correct, and if ought implies can, then it seems that there could be cases where we demonstrate a truth and yet, it is not the case that we ought to believe it.

In section 2, I will discuss the context of Hume's argument from T 1.4.4 and summarize the argument itself. In section 3, I will analyze the argument. In section 4, I will give a brief background on the history of demonstrations and what Hume retains from his predecessors. Then I will argue that Hume's argument from T 1.4.4 is a demonstration of a special variety that has not been noted in the literature and that does not generate knowledge. In section 5, I will contextualize my reading of Hume's position on knowledge and the argument from T 1.4.4 relative to T 1.4.1 (*"Of scepticism with regard to reason"*) in order to respond to a natural objection to my interpretation.

2. The context of Hume's argument in T 1.4.4

In T 1.4.4, Hume's targets are the so-called "modern philosophers," hence the title of the section (*"Of the modern philosophy"*) and Hume's description of the primary/secondary quality distinction as the "fundamental principle" of modern philosophy (T 1.4.4.3). Hume initially defines the distinction as the view that, "upon the removal of sounds, colours, heat, cold, and other sensible qualities, from the rank of continu'd independent existences, we are reduc'd merely to what are call'd primary qualities, as the only *real* ones, of which we have any adequate notion" (T 1.4.4.5). Hume tells us that he has many objections to the "system" that supports the distinction, but he will "confine [himself] to one." Hume asserts that he intends to show with his main argument in T 1.4.4.6–9 that "if colours, sounds, tastes, and smells be merely perceptions, nothing we can conceive is possest of a real, continu'd, and independent existence; not even motion, extension and

solidity, which are the primary qualities chiefly insisted on.” Although it is an interesting question what position Hume takes on the antecedent of this conditional, my focus will be on Hume’s argument for the conditional itself.¹³

Throughout the *Treatise*, Hume uses the label “modern philosophers” to refer to those philosophers who maintain that (i) mental states called “perceptions” are the *only* things that are immediately present to the mind and that (ii) some things that are represented by the mind are *not* immediately present to the mind.¹⁴ A subset of things of the latter variety are those with “continu’d and independent existence”; that is, they exist continually while not perceived by a mind, and they are located outside of the mind and causally independent from it in “existence and operation” (T 1.4.2.2). (Going forward, it is the latter of these two features that matters for Hume’s argument, so I will refer to things with “continu’d and independent existence” as “mind-independent.”) Whether these things are material or not, they are represented by the mind in virtue of being represented by a perception. Consequently, the modern philosophers are indirect realists.

In rough form, Hume’s argument against the primary/secondary quality distinction goes as follows. First, Hume argues that things that instantiate the primary qualities like extension cannot be conceived except as instantiating secondary qualities like color.¹⁵ (Much of Hume’s efforts go into establishing this controversial premise for each notable primary quality.) Given that defenders of the primary/secondary quality distinction hold that only our mental states instantiate the secondary qualities and that bodies are constituted by instantiations of the primary qualities, it follows that mind-independent bodies cannot be conceived. Mind-independent things are, by definition, not mental states.

We can see why this argument opposes the position of the modern philosophers, as it proceeds from the supposition of one of their views to a denial of their indirect realism. Those

modern philosophers who defend the primary/secondary quality distinction maintain that our ideas of bodies successfully represent mind-independent bodies because they are ideas of bodies' primary qualities. If Hume's argument goes through, they are in major trouble: indeed, we cannot represent mind-independent bodies if we cannot even conceive them. If the things that have the secondary qualities are merely our mental states, and we cannot conceive things that have the primary qualities except as things that have the secondary qualities, then our ideas of bodies could not be ideas of mind-independent bodies. At least with respect to bodies, the modern philosophers must abandon their realism because none of their ideas succeed in being indirect representations of mind-independent bodies.

3. Hume's argument in T 1.4.4

Starting in T 1.4.4.6 and ending in 1.4.4.9, Hume's argument proceeds from the assumption of the first conjunct of the primary/secondary quality distinction to a claim which entails the negation of its second conjunct:

C. If "colours, sounds, tastes, and smells be merely perceptions" of ours, then "nothing [material] we can conceive is possest of a real, continu'd, and independent existence."

Since C is a conditional, Hume must argue for it by arguing that its consequent cannot be false while its antecedent is true. Hence, the antecedent of C can be treated as the first premise:

P1. Suppose that our perceptions of colors, sounds, tastes, and smells could not be ideas of mind-independent things.

The rest of the argument finds Hume making two sets of moves for each of the three paradigmatic primary qualities (motion, extension, and solidity). First, Hume argues that, for each of these primary qualities, to conceive it is to conceive both a concrete thing that has it—in itself and not in relation to other things—and its relations.¹⁶ In the case of solidity, for instance, Hume asserts that

properly speaking, solidity or impenetrability is nothing, but an impossibility of annihilation, as has been already observ'd: For which reason 'tis the more necessary for us to form some distinct idea of that object, whose annihilation we suppose impossible. An impossibility of being annihilated cannot exist, and can never be conceiv'd to exist, by itself; but necessarily requires some object or real existence, to which it may belong. (T 1.4.4.11)

Second, Hume argues that, for each of these three primary qualities, to conceive a concrete thing that has it—in itself and not in relation to other things—is to conceive the secondary qualities of that thing. Since defenders of the primary/secondary quality distinction maintain that our perceptions of things that have secondary qualities could not be perceptions of mind-independent things and that bodies are constituted by primary qualities, it follows that our perceptions of bodies could not be perceptions of mind-independent things. The relevant part of the first set of moves can be expressed by the following three premises:

P2. Our perceptions of motion must be partially constituted by perceptions of moving bodies in themselves and not in relation to other things.

P3. Our perceptions of extension must be partially constituted by perceptions of extended bodies in themselves and not in relation to other things.

P4. Our perceptions of solidity must be partially constituted by perceptions of solid bodies in themselves and not in relation to other things.

In the passages containing his argument, Hume does not give much in the way of justifications for these premises. Regarding Hume's identification of our perceptions of the primary qualities with perceptions of concrete things that have these qualities, this lacuna is explicable since such an identification is entailed by the nominalism that Hume defends throughout his writings. Hume consistently maintains that it is not possible for there to be uninstantiated qualities or qualities instantiated in indeterminate ways, whether in thought or not.¹⁷ However, it is less clear why Hume assumes that a perception of a thing's primary qualities is, in part, a perception of that thing in itself and not in relation to other things. Hume's underlying view seems to be that even if a primary quality is itself entirely relational, to conceive of a thing that has it requires conceiving of that thing as it is in itself, and not merely as it relates to other things. One cannot conceive of a rock as contiguous to another without conceiving that there is something the two rocks are like in themselves; conceiving *only* the contiguity of two things is impossible.

To make the second set of moves noted above, Hume begins by leveraging to his advantage what Locke calls the "visible connexion" between some primary qualities. While Locke's position is that the primary qualities are the essential qualities of matter—such that it is necessary that every body is in motion or at rest, extended, and solid—he does not maintain that this fact is intuitively knowable. Bodies do not wear all their primary qualities on their sleeves, as it were. Locke maintains that we can know with certainty that a thing *b* instantiates a primary quality *x* only if *either* we perceive *b* to instantiate *x* via our senses, *or* a quality *y* that we perceive *b* to instantiate bears a visible connection to *x*.¹⁸ A visible connection is, in turn, a necessary link between the two qualities. Some such connections must be demonstrated, but others are

immediately perceived (that is, intuitive) such that in virtue of perceiving *b* instantiating *y*, we perceive it instantiating *x*. In the case of motion, Hume argues that

P5. Our perceptions of moving bodies must be partially constituted by either perceptions of extended bodies or perceptions of solid bodies.

Hume does not give any argument for P5 because he seems to assume that Locke would grant that there is an immediately visible connection between motion and either extension or solidity. Hume maintains that the fact that there is such a palpable link between these primary qualities is self-evident if only one considers one's perceptions of moving bodies. A moving body is inconceivable unless it is conceived to be extended or solid; in our thoughts, a moving body just is an extended or solid body that undergoes a change in place.

Given P2–P4, the role of P5 is to narrow down the range of perceptions of bodies (in themselves and not in relation to other things) that could be partial constituents of our perceptions of motion to those that are partial constituents of our perceptions of extension and solidity. With his next premise, Hume identifies the perceptions which are constituents of *some* of our perceptions of extended bodies:

P6. Our perceptions of extended bodies must be constituted by perceptions of arrays of (non-overlapping) simple parts that are either colored points or solid points.

Since defenders of the primary/secondary quality distinction maintain that our perceptions of things with secondary qualities could not be perceptions of mind-independent things, those perceptions of extended bodies that are constituted by perceptions of colored points are *not* perceptions of mind-independent bodies. However, Hume has not arrived at his overall conclusion yet, given that P6 also makes room for some perceptions of extended bodies to be

constituted by perceptions of solid points. This brings us to the first derived premise, which follows from P5 and P6:

C1. If either our perceptions of moving bodies or our perceptions of extended bodies could be perceptions of mind-independent bodies, then these perceptions must be partially constituted by perceptions of solid bodies and these perceptions of solid bodies must be perceptions of mind-independent bodies.

Conjoined with P2–P4, C1 entails that only if our perceptions of solid bodies could be partially constituted by perceptions of *mind-independent* bodies in themselves (and not in relation to other things) could our perceptions of moving or extended bodies be partially constituted by perceptions of *mind-independent* bodies in themselves (and not in relation to other things). And if our perceptions of moving or extended bodies could *not* be so constituted, then they would *fail* to be perceptions of mind-independent bodies. This is why Hume subsequently asks, “what idea we have of these [solid] bodies?” Everything is resting on our ideas of solid bodies. As Hume states, “ideas of colours, sounds, and other secondary qualities are excluded. The idea of motion depends on that of extension, and the idea of extension on that of solidity” (T 1.4.4.9). Oddly enough, at this juncture in the text, Hume abruptly infers two further conclusions:

C2. Our perceptions of solid bodies could not be perceptions of mind-independent things.

C3. Our perceptions of bodies could not be perceptions of mind-independent things.

Fortunately, shortly thereafter Hume repeats himself in a way that reveals the assumptions underlying his inferences. This is the first paragraph after the main argument from T 1.4.4, which

is a paragraph in which Hume repeats the argument to “render it more obvious by some variation of the expression.” Here is what Hume writes, and again he is abrupt:

Now I ask, what idea do we form of these bodies or objects, to which we suppose solidity to belong? To say, that we conceive them merely as solid, is to run on *in infinitum*. To affirm, that we paint them out to ourselves as extended, either resolves all into a false idea, or returns in a circle. Extension must necessarily be consider'd either as colour'd, which is a false idea; or as solid, which brings us back to the first question. We may make the same observation concerning mobility and figure; and upon the whole must conclude, that after the exclusion of colours, sounds, heat and cold from the rank of external existences, there remains nothing, which can afford us a just and consistent idea of body. (T 1.4.4.10)

Since Hume adduces no additional premises to facilitate the inference to C2 from the premises before, and P1 and P4 are the only prior premises that could be relevant to explaining his abruptness, it must be these premises that provide the answers. P2 and P5 concern motion. P3 and P6 concern extension. If all Hume has asserted is that our perceptions of colors, sounds, tastes, and smells could not be perceptions of mind-independent things (P1), that our perceptions of solidity must be at least partially constituted by perceptions of solid bodies in themselves and not in relation to other things (P4), and that our perceptions of solid bodies could not be perceptions of mind-independent things (C2), then he must be assuming that our perceptions of colors, sounds, tastes, or smells are the only perceptions we could have of solid bodies in themselves and not in relation to other things. That is, Hume is assuming that the only way that solid bodies could be conceived is as having the secondary qualities listed in P1. (And conceiving of solid bodies as moving or

extended is no help, as these bodies are inconceivable unless we conceive of them as having color or “as solid, which brings us back to the first question.”)

Of course, a natural worry here is that colors, sounds, tastes, and smells do not exhaust the available options. Why not think that the perceptions which partially constitute our perceptions of solid bodies are those resembling the feelings we get from touching solid bodies? Hume seeks to disabuse his readers of this notion in the paragraphs concluding T 1.4.4. This task is all the more pressing given that Locke explicitly argues that the solidity of mind-independent bodies is directly sensed via touch.¹⁹

Hume is emphatic that he was *not* begging the question by assuming the contrary of Locke’s position on this issue with P1 (as his previous statements of P1 corroborate). And Hume is equally emphatic that touch does not provide an escape route for Locke: “tho’ bodies are felt by means of their solidity, yet the feeling is a quite different thing from the solidity; and that they have not the least resemblance to each other” (T 1.4.4.13). Given that Hume argues the feelings caused in us by solid bodies do not resemble our perceptions of solid bodies, given that he maintains that we cannot form perceptions of solid bodies “without having recourse to the secondary and sensible qualities” (T 1.4.4.11) listed in P1, and given that our perceptions of solid bodies could not be even partially constituted by perceptions of sounds, tastes, or smells, it seems that Hume’s view is that

P7. Our perceptions of colored points are the only perceptions we could have of solid bodies in themselves and not in relation to other things.

Because the preceding line of reasoning is not self-evident in the premises Hume explicitly provides, this suppressed premise ought to be inserted between C1 and C2.²⁰

4. Hume's argument in T 1.4.4 is an analytical demonstration

4.1 Demonstrations, Humean and otherwise

Before I argue that Hume intends his argument to be a demonstration, some background on demonstrations is needed. Aristotle is the progenitor of the concept, and demonstrations hold an especially prominent place in the Aristotelian tradition. In *Metaphysics* Γ 1–3, Aristotle argues that philosophy is the most fundamental “science” since it concerns the necessary and universal “axioms” of things in general.²¹ Particular sciences, like biology, concern proper subsets of the things. The philosopher’s job is to investigate the axioms of “that which is *qua* thing-that-is” (“being *qua* being”) and to unfold their consequences in order to achieve the highest sort of knowledge.²² Demonstrations just are elaborations of the first principles, and this is why Aristotle describes the fruits of distinctively philosophical reasoning as “demonstrative understanding.”²³ Aristotle argues that demonstrations themselves are sound syllogistic arguments with necessary truths for premises, and he proposes that the premises of demonstrations must be better known than, prior to, and asymmetric explanations of their conclusions.²⁴ Aristotle insists that the philosopher who demonstrates does not merely know *that* something is the case, but also *why* it is so.

Although the concept of demonstration persists in forms faithful to its Aristotelian roots through the medieval period, it undergoes a significant transformation in the hands of the early moderns. Previously of central importance, for early modern philosophers the syllogism was to be avoided, even derided.²⁵ The *forms* that inferences can take decline in prominence and the focus turns to their *content*. This shift is owed in no small part to the rise of an interest in empirically driven psychology—a shift which leads early modern thinkers like Locke to attempt to locate demonstrations *in the mind itself*. In his *Essay*, Locke defines demonstration as “where the mind

[clearly] perceives the agreement or disagreement of any ideas, but not immediately” and knowledge as “nothing but the perception of the connexion and agreement, or disagreement and repugnancy, of any of our ideas,” thereby collapsing Aristotle’s distinction between demonstration and demonstrative understanding.²⁶

One important consequence of this reconfiguration is that the domain of the demonstrable becomes significantly more restricted. As Locke notes, since not everything about our ideas can be demonstrated, “the extent of our knowledge comes not only short of the reality of things, but even of the extent of our own ideas” (E IV.iii.6). Famously, Locke argues that it is “impossible for us, by the contemplation of our own ideas, without revelation, to discover, whether omnipotency has not given to some systems of matter fitly disposed a power to perceive and think, or else joined and fixed to matter so disposed a thinking immaterial substance” (E IV.iii.6). This pessimism about the demonstrability of mind-body dualism directly contrasts with the optimism of Descartes. Referring to the main arguments in his *Meditations*, Descartes writes to the theology faculty at Sorbonne that

I know that the only reason why many irreligious people are unwilling to believe that God exists and that the human mind is distinct from the body is the alleged fact that no one has hitherto been able to demonstrate these points. Now I completely disagree with this: I think that when properly understood almost all the arguments that have been put forward on these issues by the great men have the force of demonstrations. (AT 7:3)

Hume absorbs the assumptions of Locke at the expense of both Descartes and Aristotle. Given that Hume is deeply interested in human nature, and he sees the mind as its primary source, he preoccupies himself with giving a comprehensive account of the mind. Consequently, anything,

demonstrations included, must be understood through its lens. Following Locke, Hume divides knowledge acquisition into two kinds: intuition and demonstration.²⁷ For Hume, we can acquire demonstrative knowledge when we chain multiple instances of intuitive knowledge to one another in order to know something which could not have been known without so doing.²⁸ Like Locke, who maintains that intuitive knowledge can be acquired from perceiving two ideas together “at the first sight . . . without the intervention of any other *Idea*; [and that] this kind of Knowledge is the clearest, and most certain, that humane Frailty is capable of” (E IV.ii.1), Hume holds that intuitive knowledge is immediate and direct knowledge of its objects.²⁹ Since Hume maintains that knowledge comes in the form of perceptions that are immediately present to the mind (which come in two varieties, impressions and ideas), and if, as it is widely held, he rejects direct realism, Hume agrees with Locke that knowledge—and so its acquisition via demonstration—is a mental affair.³⁰

Hume holds that “the objects of knowledge and certainty,” or the knowable things, are relations of a special variety (T 1.3.1.2). These relations, which I will call the ‘knowable relations’, are unique in being dependent only on their relata in themselves and not in relation to other things. That is, the nature of the relata of the knowable relations is the sole determinant of whether the relations hold or not.³¹ Here is Hume introducing this criterion in T 1.3.1 (“*Of knowledge*”):

These relations may be divided into two classes; into such as depend entirely on the ideas, which we compare together, and such as may be chang’d without any change in the ideas. ’Tis from the idea of a triangle, that we discover the relation of equality, which its three angles bear to two right ones; and this relation is invariable, as long as our idea remains the same. On the contrary, the relations of *contiguity* and *distance* betwixt two objects may be chang’d merely by an alteration of their place, without any change on the objects themselves or on their ideas; and the place

depends on a hundred different accidents, which cannot be foreseen by the mind.

(T 1.3.1.1)

As Hume explains in the subsequent paragraphs, he ends up with this criterion because he is a knowledge infallibilist: so long as one has in mind two things in themselves and not in relation to other things, one cannot err about which knowable relations they bear to one another.³² The rest of the world need not cooperate, hence knowledge's immediacy and directness. It is for this reason that Hume holds that only those perceptions that have knowable relations as objects can qualify as instances of knowledge.

Hume also holds that the knowable relations are necessary. This aspect of Hume's position stems from his endorsement of the Conceivability Principle, which is the claim that "whatever we conceive is possible" (T 1.4.5.10).³³ For any two things x and y , and for any relation R which is *not* a knowable relation, Hume argues that if we conceive of x and y in themselves, we do not thereby conceive either xRy or $\sim(xRy)$. The nature of the two does not determine that we conceive of them as so related or not. Given the Conceivability Principle, it follows that it is possible that xRy and it is possible that $\sim(xRy)$, regardless of how x and y are in themselves and which non-knowable relation R is. This line of reasoning is one prong of Hume's negative position on the necessary connection that holds between causal relata. Having the nature of two billiard balls in mind does not require conceiving of them as causally related or not, so it is not necessary that they are causally related (for any two billiard balls).³⁴

Traditionally, commentators have argued that *all* the premises of Humean demonstrations are knowable relations.³⁵ In the next two subsections, I will argue that Hume holds that some demonstrations do not have knowable relations for premises or conclusions, and thus these demonstrations cannot generate knowledge. Members of this second kind of demonstration, which

I will call “analytical demonstrations,” and which include Hume’s argument in T 1.4.4, consist of analyses of perceptions, and not in sequences of relations between them. What exactly this amounts to will become clear in what follows.

4.2 The argument from T 1.4.4 is an analytical demonstration

Recall the conclusion of Hume’s argument:

C. If “colours, sounds, tastes, and smells be merely perceptions” of ours, then “nothing [material] we can conceive is possest of a real, continu’d, and independent existence.”

If C is the conclusion of a demonstration, then C is a necessary truth, given Hume is emphatic that “wherever a demonstration takes place, the contrary is impossible, and implies a contradiction” (Abs 11).³⁶ So, is C a necessary truth? Regarding the antecedent of C, Hume states that “only one of the reasons commonly produc’d for this opinion” is “satisfactory” and this reason comes in the form of an argument from perceptual relativity with contingent premises (T 1.4.4.3).³⁷ It is likely, then, Hume classifies the antecedent of C as contingent, for otherwise the antecedent of C would be demonstrable (or capable of being intuited). Nonetheless, this does not rule out C from being a necessary truth. To see why, consider another formulation of C. In accordance with my analysis from sections 2 and 3, C can be equivalently expressed as follows:

C. If our perceptions of colors, sounds, tastes, and smells could not be perceptions of mind-independent things, then our perceptions of bodies could not be perceptions of mind-independent things.

If Hume holds that the antecedent of C is contingent, then he holds that the consequent is contingent as well. After all, as I argued in sections 2 and 3, Hume's argument contends that our perceptions of bodies must be perceptions of things with secondary qualities like colors, so the antecedent of C expresses a tautology with the same form as the claim that if not p , then not p .³⁸ By Hume's lights, it can only be revealed to be a tautology by conceptual analysis, but it is a tautology nonetheless. Since all tautologies are necessary, C is necessary.

For an analogous case, consider the claim that if all bachelors are shorter than 9 feet, then all unmarried men are shorter than 9 feet. While both antecedent and consequent are contingent, the conceptual relationship between bachelorhood and being an unmarried man entails that the conditional is necessarily true; 'bachelor' and 'unmarried man' can be substituted *salva veritate*. Hume intends C to be a necessary truth of the same sort, so even though the antecedent of C is contingent, Hume's demonstration is designed to display the consequences of it given a series of necessary truths about the conceptual relationships between the features at issue.

Next are P2 through P4. As noted in section 3, these premises follow from Hume's assumption that a perception of a thing's primary qualities is, in part, a perception of that thing in itself and not in relation to other things. If only we reflect on the perceptions that we have of motion, extension, and solidity, we will find that they are partially constituted by perceptions of the moving, extended, and solid bodies at issue in themselves and not in relation to other things. Since Hume implies that this assumption is a conceptual truth, he must intend P2–P4 to be necessary as well. Likewise, Hume maintains that there is an immediately visible connection between motion and either extension or solidity. In our thoughts, a moving body just is an extended or solid body that undergoes a change in place. If Hume is right about this conceptual relationship, then P5 expresses a necessary truth.³⁹

Hume's argument for P6 is illuminating for several reasons. First, it shows why Hume classifies P6 as necessary. Second, it consists of a pair of analytical demonstrations, just like Hume's overall argument for C, or so I will contend. To establish P6, Hume relies on some of the views he argues for earlier in the *Treatise*. Two of these views can be formed into an argument for P6 as follows:

(a) Our perceptions of extended bodies must be constituted by perceptions of arrays of (non-overlapping) parts which do not have any parts of their own. Call these parts 'simple parts'.

(b) Our perceptions of a part of an extended body must be constituted by either a perception of a colored point (or multiple such ideas) or a perception of a solid point (or multiple such ideas).

P6. Our perceptions of extended bodies must be constituted by perceptions of arrays of (non-overlapping) simple parts that are either colored points or solid points.

The conjunction of (a) and (b) entails P6, so Hume assumes P6 in T 1.4.4 because of his prior arguments for (a) and (b). When he first introduces it, Hume is explicit that one of the two arguments he gives for (a) is a demonstration. However, this demonstration is *not* a traditional non-analytical demonstration, as it—like the other argument for (a)—does not consist of any knowable relations. Hume begins by stating that it will be from the mere “consideration of [his] clear ideas” that he will establish (a) and any claims that depend on it (Hume's ultimate goal at that juncture in the text, in T 1.2.2.2, is to show that no finite thing is infinitely divisible). The central idea in question is “the least idea [he] can form of a part of extension,” which Hume claims is an idea of a simple part (a part that has no further parts). Hume takes his idea of a simple part, multiplies it, and notes that the resultant idea of extension grows proportionately. From this, Hume

infers that a perception of an extended thing constituted by an infinite quantity of parts could not be finite and that a perception of a finite extended thing must be constituted by a finite quantity of parts. There are no knowable relations involved in this reflective exercise. Hume simply reflects on his ideas in order to analyze the nature of two kinds of perceptions of extension (infinite and finite) via the imagined manipulation of his idea of a simple part.

Hume is not at all tentative about the demonstrative status of this argument. Four paragraphs after it, Hume describes it and the intervening arguments (none of which are traditional demonstrations) as follows:

I doubt not but it will readily be allow'd by the most obstinate defender of the doctrine of infinite divisibility, that these arguments are difficulties, and that 'tis impossible to give any answer to them which will be perfectly clear and satisfactory. But here we may observe, that nothing can be more absurd, than this custom of calling a *difficulty* what pretends to be a *demonstration*, and endeavouring by that means to elude its force and evidence. (T 1.2.2.6)

It seems, then, that we should take Hume seriously that he understands this as a demonstration, and we should reject the received view that demonstrations always involve knowable relations. The cost of failing to do so is an abandonment of the status of these arguments in T 1.2 that Hume takes to be demonstrative and thus unassailable evidence against the “doctrine of infinite divisibility.”

Hume's second argument for (a), which is found just prior to the first, is like the first argument in that both consist of analyses of ideas of the simple parts of extension. So, it would seem to qualify as a demonstration of the same sort. What about the argument for (b)? Although Hume does not explicitly label this argument as a “demonstration,” it too is similar in the relevant

respects to the demonstration of (a). Hume argues for (b) by reflection on his occurrent ideas (T 1.2.3.15–16). Of the simple parts of ideas of extended bodies, Hume asserts that

'[T]is also necessary we shou'd preserve the idea of their colour or tangibility in order to comprehend them by our imagination. There is nothing but the idea of their colour or tangibility, which can render them conceivable by the mind. Upon the removal of the ideas of these sensible qualities, they are utterly annihilated to the thought or imagination. (T 1.2.3.15)

And Hume repeats himself immediately thereafter (note that in both cases “tangible” is another word for “solid,” and “tangibility” is another word for “solidity”):

But if the idea of extension really can exist, as we are conscious it does, its parts must also exist; and in order to that, must be consider'd as colour'd or tangible. We have therefore no idea of space or extension, but when we regard it as an object either of our sight or feeling. (T 1.2.3.16)

Given that this argument for (b) is an analysis of an idea in the same way that the demonstrations for (a) are, and given that Hume deems the latter demonstrations, this argument would seem to qualify as a demonstration as well. Since P6 is entailed by these premises, it follows that Hume categorizes P6 as a necessary truth. Because C1, C2, and C3 follow from the preceding premises, they must be necessary truths as well.

Hume's argument from T 1.4.4 has a necessary conclusion and premises, and it is similar in the relevant ways to Hume's analytical demonstration of (a). The main argument is more complicated than the latter argument, but both consist of analyses of ideas. We have good reason,

then, to interpret Hume as classifying his argument for C and against the primary/secondary quality distinction as an analytical demonstration.

4.3 No knowable relations in sight

Nevertheless, there are several reasons to think that *none* of the premises of Hume's main argument in T 1.4.4 are knowable relations. First, Hume would argue that some of the premises are not relations *of any variety*. P2 through P6 are whole-part relations (or whole-part relations joined by logical connectives). While Hume states that *qualitative* identity is a relation, he denies that *numerical* identity is a relation because he holds that all relations have numerically distinct relata (T 1.1.5 and 1.4.2.26). Since a whole is not distinct from its constituent parts, P2 through P6 are not relations, so they are not knowable relations. Second, Hume is emphatic that there are only four kinds of knowable relations, and none of his premises belongs to one of these four kinds. The four kinds are resemblances, quantitative relations, degrees of a quality, and contraries.⁴⁰ P2 through P6 are *not* resemblances like the resemblance with respect to greenness between a blade of grass and a leaf. They are *not* quantitative relations like that which three bears to two. They are *not* degrees of a quality like that which scarlet bears to crimson. In being partially constituted by either perceptions of extended bodies or perceptions of solid bodies, our perceptions of moving bodies are not greater or lesser in any respect than these perceptions. And they are *not* contraries because they are not contrastive claims, like the claim that existence and non-existence are contraries (the only contrariety Hume explicitly cites in the *Treatise*), or the claim that one object destroys another and vice versa (the only contrariety Hume explicitly cites in the first *Enquiry*).⁴¹ It is true that the claims composing the argument in T 1.4.4 *have* contraries, but this is true of all

claims whatsoever, and it does not follow that the claims are themselves contrarities. P7 is a claim about conceivability, so it does no better at fitting into Hume's fourfold schema.

The same goes for the conclusion C. As noted in the prior subsection, it seems that Hume categorizes the antecedent of C as contingent. It could not, then, be a knowable relation, and so C could not be a logical connective joining knowable relations. As a consequence, C does not meet what Hume takes to be the necessary conditions for knowledge, so Hume would deny that C is knowable. Hume must hold that C is demonstrable, but neither knowable nor believable.

5. The relation of T 1.4.1 to T 1.4.4

A natural objection to the preceding interpretation is that it does not take into account the apparent fact that Hume rules out demonstrative knowledge—and knowledge in general—in a preceding section of part 4 of Book 1 of the *Treatise*, namely T 1.4.1 (“*Of scepticism with regard to reason*”). In that section, Hume tells us that he has an argument by which it is shown that “all knowledge degenerates into probability” (T 1.4.1.1; T 1.4.1.4). If we take Hume at his word, then it looks like we do not need to analyze the intricacies of T 1.4.4 to see that the argument therein cannot produce knowledge. The path to an anti-Cartesian and anti-Aristotelian position is much more direct.

While a full interpretation of T 1.4.1 is beyond the purview of this paper, I will give a sketch of my response here. The cornerstone of my reading of T 1.4.1 is the claim that Hume's concern in that section is *not* with knowledge as he defines it in T 1.3.1—that is, his concern is not with knowledge in his strict sense. Hume's concern in T 1.4.1 is with knowledge when it takes the form of “assurance,” which, for him, is a cluster of dispositions that arise after the acquisition of knowledge in his strict sense. The mathematician has assurance in the Pythagorean theorem after

demonstrating it, and this assurance is, among other things, a confidence in it, a willingness to assume it in other mathematical reasoning, and so on.

The reasons to read T 1.4.1 in this way are manifold, but I will focus on two. First, throughout T 1.4.1, Hume uses terminology to refer to knowledge—like “assurance,” “confidence,” “security,” and “evidence”—that he uses elsewhere in his corpus to refer to the dispositions that arise as effects of the acquisition of knowledge in his strict sense. For instance, Hume argues elsewhere that “the assurance of a demonstration proceeds always from a comparison of ideas, tho’ it may continue after the comparison is forgot” (T 1.3.4.3), where a comparison of ideas is an idea of a knowable relation, and that “our confidence in the veracity of that faculty [of memory] is the greatest imaginable, and equals in many respects the assurance of a demonstration” (T 1.3.13.19). The assurance to which Hume refers in these passages could *not* be a perception of a knowable relation (that is, knowledge in the strict sense), or else it would not be comparable to our confidence in our memory, nor would a thinker be able to possess it despite forgetting the relevant knowable relations (which would be a contradiction). Likewise, in T 1.4.1, when Hume uses “assurance” and other similar terms, he refers to the way in which mathematicians treat mathematical truths after proving them or the way in which merchants use linguistic crutches like records to develop trust in past calculations.

Second, the argument Hume gives in T 1.4.1 does not affect knowledge in his strict sense and is plausible only under the assumption that it concerns knowledge in this derivative sense. The argument in T 1.4.1 has two phases, one in 1.4.1.2–4, where Hume argues that knowledge “resolves” into probability, and one in 1.4.1.5–12, where Hume examines the foundation of probability. In the first phase, Hume asserts that whether you are a mathematician or a merchant, you do not “place entire confidence in any truth immediately upon [your] discovery of it, or regard

it as any thing, but a mere probability” (T 1.4.1.2–3). You review your records, checking your work for errors and finding none, thereby gradually increasing your “assurance” in what you remember demonstrating. Yet, your assurance never reaches absolute certainty, regardless of how well-designed your record system is or how experienced and skilled you are. Even in cases where the past calculation was “the most simple question, which can be form’d,” namely the sum derived from the “addition of two single numbers,” you cannot have full “security” about it subsequent to calculating it (T 1.4.1.3). If you could, then you could have this sort of security in more complex cases.

This argument could not concern knowledge in Hume’s strict sense. Such knowledge does not persist beyond the time at which it is initially acquired, because its existence is dependent on the existence of a perception of the relevant knowable relation. Likewise, it is not a form of confidence, as it is an occurrent mental object. It is *not* scalar in any respect, as you either have it or you do not. The infallibility and certainty provided by an instance of strict knowledge is maximal when it is possessed, and the possession of it does not rely on any higher-order judgment about its status.

The second phase of the argument confirms this reading. There, Hume argues that if “in every reasoning [we must] form a new judgment, as a check or controul on our first judgment or belief” (T 1.4.1.1) about the reliability of our faculties of judgment, then this second somewhat uncertain judgment would lessen our confidence in the object of the first judgment. Since we would then be forced to judge the probability that our first two judgements were correct, and since this third judgment would not be certain either, we would further reduce our confidence. But this never happens, and we retain confidence in our judgments. For Hume, this shows that belief must be a “sensitive” matter rather than a “cogitative” one (T 1.4.1.8), for otherwise we would have no

beliefs because our infinitely iterative doubts about them would undermine them. In the present context, this is relevant because it shows that Hume understands the kind of knowledge discussed in the first phase of the argument as continuous with belief, which is a scalar notion (variable due to variable vivacity) that has a tight relationship with the sort of assurance that qualifies as knowledge in Hume's derivative sense. To return to the quote from Ainslie from section 1, we can see why an interpretation like Ainslie's is correct, even if it is missing an account of why Hume holds that there is "no error" in arguments like the main one in T 1.4.4. As Hume makes clear in T 1.4.1, his broader goal in Part 4 is to provide evidence for his account of the mind (and his account of belief, which is its central component).

6. Conclusion

Suppose, like Hume, we find no flaws in his skeptical argument from T 1.4.4. According to Hume, upon considering it and its conclusion, we are temporarily confused and disconcerted. The subject-matter is abstruse and the reasoning is complex. Our minds must strain to comprehend the procession of ideas involved, and this "straining . . . hinders the regular flowing of the passions and sentiments" (T 1.4.1.11). We suffer the "momentary amazement and irresolution and confusion, which is the result of skepticism" (EHU 12.15). Regardless of our understanding of its logic or premises, we do not believe the conclusion or its consequent. On Hume's picture of demonstration, this skeptical argument is conceivable but incredible. To make matters worse, we do not *know* the conclusion or its consequent either. What are we to do? What we cannot do, if Hume is correct, is infer that we have any evidence of the falsity of its conclusion—a raw appeal to common sense is undermined by Hume's position. Fortunately, our belief-generating faculties soon step in and bring our attention back to those subjects that come more naturally. As Hume

says, it “is happy, therefore, that nature breaks the force of all sceptical arguments in time, and keeps them from having any considerable influence on the understanding” (T 1.4.1.12).

The fact that Hume intends the argument to be a demonstration is crucial to the plausibility of the prevailing interpretation of its role in his overall project. It needs to be more than incredible to justify Hume’s account of the mind—it needs to be decisive. Yet, the possibility that Hume is right confronts us with deeper questions that challenge us irrespective of our views on the particulars of the argument. First, what attitude do we have towards those arguments that we think are sound but whose conclusions we cannot bring ourselves to believe? Perhaps Hume is wrong that we cannot *know* in such cases. If so, does this mean that many of us are wrong in thinking that knowledge entails belief? It may be that our beliefs only serve more basic purposes, like guiding us as we travel to work or helping us to avoid dangerous animals, but we can nonetheless achieve knowledge about abstruse philosophical claims.

Second, and more importantly, should we modify our views on the role of philosophy? If philosophical argumentation does not provide an independent path to true beliefs, then it seems that its position in our epistemic lives should be re-evaluated. The faculty of reason may lack sovereignty. In some cases, it might be that we ought to recruit the other faculties in trying to convince our peers and our students of philosophical views. In other cases, none of our faculties can make us believe what we have demonstrated. Either way, we may need to abandon some of philosophy’s ambitions. Indeed, this seems to be Hume’s conclusion when he muses that “[w]here reason is lively, and mixes itself with some propensity, it ought to be assented to. Where it does not, it never can have any title to operate upon us” (T 1.4.7.11).

NOTES

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¹ References to the *Treatise* are to Hume, *A Treatise of Human Nature*, ed. Norton and Norton (Oxford: Clarendon Press, 2007), hereafter cited in the text as “*Treatise*” or “T” followed by either Book, part, and section number, as in this case, or Book, part, section, and paragraph number.

² References to the first *Enquiry* are to Hume, *An Enquiry concerning Human Understanding*, ed. Beauchamp (Oxford: Clarendon Press, 2001), hereafter cited in the text as “*Enquiry*” or “EHU” followed by section and paragraph number.

³ This is to use “reason” in Hume’s narrow sense which contrasts with the “imagination.” I will use it in this way in what follows.

⁴ Hume discusses beliefs of the first variety in, e.g., T 1.3.6.15, 1.3.7.5, 1.3.7.6, 1.3.8.1, 1.3.8.6–11, 1.3.8.15, 1.3.9.8, 1.3.10.3, 1.4.2.41, 2.3.6.10, App 3, EHU 5.12, and 5.13. Hume discusses beliefs of the second variety at the end of T 1.3.9.

⁵ This quotation is part of Hume’s title for part 4 of Book 1 of the *Treatise*.

⁶ Compare with the endnote in EHU 12.15.

⁷ Donald C. Ainslie, *Hume’s True Scepticism* (Oxford: Oxford University Press, 2015), 8.

⁸ As far as I can see, no commentator to date has been concerned with whether Hume classifies the arguments as demonstrations or not. In fact, in their descriptions of Hume’s arguments, they paraphrase Hume’s position in ways that obscures the precise character of their interpretations. Janet Broughton writes that “Hume is indeed committed

to his deeply negative conclusions: they are what he really thinks” (“The Inquiry in Hume’s *Treatise*,” *The Philosophical Review* 113, no. 4 (2004): 537–56, 49). Likewise, Phillip D. Cummins describes Hume as thinking that the skeptical arguments are “irrefutable” (“Hume’s Diffident Skepticism,” *Hume Studies* 25 (1999): 43–65, 50). And David Owen describes the conclusions themselves as “results” because Hume takes himself to have proven them in some strong sense (“Scepticism with Regard to Reason,” in *The Cambridge Companion to Hume’s Treatise*, ed. Donald C. Ainslie and Annemarie Butler (Cambridge: Cambridge University Press, 2015), 101–34, 25). What would it be for Hume to “really think” something? It is not clear how irrefutability fits into Hume’s system. Hume does not refer to “results” in this way. Are these commentators asserting that the arguments are demonstrations?

⁹ “Inferiorities” here should be interpreted to refer to ways in which arguments are worse than others. This is not to claim that arguments that are not demonstrations are inferior in the sense that they are no good at all—just that if a demonstration could be generated for their conclusions, it would be better. Like intuitions, demonstrations provide epistemic certainty, something that neither causal “proofs” nor “probabilities” are capable of. See, for example, T 1.2.2.6 (quoted below), 1.2.4.17, 1.3.1.1–2, 1.3.3, and 1.3.6.5–7.

¹⁰ For Descartes, see, e.g., AT 7:5–6 and 7:57–58. References to Descartes’ works are to Descartes, *Oeuvres de Descartes*, ed. Charles Adam and Adam Tannery (Paris: Librairie Philosophique J. Vrin, 1964–76), hereafter cited in the text as “AT” followed by volume and page number. For Aquinas, see, e.g., *Summa Theologiae* Ia.79.9. This reference is to Aquinas, *Summa Theologiae*, ed. Freddoso, here cited by part, question, and article number.

¹¹ On the first point, see Descartes’ discussion at AT 7:1–3.

¹² This is the one case where Hume seems to indicate that he holds a cognitive—as opposed to sensitive—account of belief. My interpretation of this passage is that Hume rejects as unsatisfactory this cognitive, mere conception account of belief because it is not generalizable to the case of “reasonings from causation, and concerning matters of fact.” Furthermore, Hume never mentions it again and it is deeply incongruent with the account developed throughout part 3 of Book 1 of the *Treatise*.

¹³ For discussion of whether Hume endorses the antecedent, see Annemarie Butler, “Hume’s Causal Reconstruction of the Perceptual Relativity Argument in *Treatise* 1.4.4,” *Dialogue* 48, no. 1 (2009): 77–101; Jani Hakkarainen, “Hume on the Distinction between Primary and Secondary Qualities,” in *Vanishing Matter and the Laws of Motion: Descartes and Beyond*, ed. Peter Anstey and Dana Jalobeanu (London: Routledge, 2011), 235–59, esp. 40–47;

Kenneth Winkler, “Hume and the Sensible Qualities,” in *Primary and Secondary Qualities: The Historical and Ongoing Debate*, ed. Lawrence Nolan (Oxford: Oxford University Press, 2011), 239–73; Jani Hakkarainen, “Hume’s Scepticism and Realism,” *British Journal for the History of Philosophy* 20, no. 2 (2012): 283–309; and Jason R. Fisette, “Hume on the Lockean Metaphysics of Secondary Qualities,” *Hume Studies* 40, no. 1 (2014), 95–136, esp. section 2.2.1. I agree with Jani Hakkarainen that if Hume does endorse the antecedent and nonetheless maintains that there are bodies, then “in that case his metaphysics of body would be nonmaterialist and his philosophy non-Realist in general.” For discussion, see Hakkarainen, “Hume on the Distinction between Primary and Secondary Qualities,” 236 and throughout.

¹⁴ See, in particular, T 1.4.2.

¹⁵ Note that by “secondary qualities,” here and throughout I refer to what have been called “proper sensibles” (the immediate objects of our senses) and *not* the powers or dispositions in the bodies that supposedly cause or explain proper sensibles. Hume refers to the former with “sensible qualities.” I am merely following Hume’s terminology when I use this terminology—at no point do I intend to refer to powers or dispositions. For discussion, see Hakkarainen, “Hume on the Distinction between Primary and Secondary Qualities,” 236–40.

¹⁶ Hume is here tracking the contemporary distinction between intrinsic and extrinsic properties. Roughly, intrinsic properties are those that a thing would have regardless of whether any other things exist or not, while extrinsic properties are those that are not intrinsic.

¹⁷ See especially T 1.1.7.

¹⁸ See, for instance, E IV.iii.14. References to the *Essay* are to Locke, *An Essay Concerning Human Understanding*, ed. P.H. Niddich (Oxford: Oxford University Press, 1975), hereafter cited in the text as “E” followed by book, chapter, and paragraph number.

¹⁹ See E II.iv.1 and E II.viii.9.

²⁰ For a congenial, if abbreviated, reading of Hume’s argument, see Fisette, “Hume on the Lockean Metaphysics of Secondary Qualities,” 108–112.

²¹ Namely, in *Metaphysics* 1003a20–1005b35. This reference is to Aristotle, *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. Jonathan Barnes (Princeton: Princeton University Press, 1985), here and hereafter cited by book followed by Bekker lines (or line ranges).

²² The first translation is from Christopher Kirwan (Aristotle, *Aristotle: Metaphysics Books Γ, Δ, and E*, tr. and ed. Christopher Kirwan (Oxford: Clarendon Press, 1993), 1), while the second is from Jonathan Barnes (Aristotle, *The Complete Works of Aristotle: The Revised Oxford Translation*, 1985).

²³ See Book 1 of the *Posterior Analytics*. “Demonstrative understanding” is Barnes’ translation (1984, *The Complete Works of Aristotle: The Revised Oxford Translation*, 115 and throughout).

²⁴ On the first point, see *Prior Analytics* 24a21–b12 and *Posterior Analytics* 71b9–24, 73a21–24 and 74b5–17, as well as *Topics* 100a25–b20. On the second, see *Posterior Analytics* 71b20 and throughout.

²⁵ For the latter, see Descartes’ comments in his *Rules for the Direction of the Mind*, where he claims that syllogistic reasoning “contributes nothing whatever to knowledge of the truth, we should realize that, on the basis of their method, dialecticians are unable to formulate a syllogism with a true conclusion unless they are already in possession of the substance of the conclusion, i.e. unless they have previous knowledge of the very truth deduced in the syllogism. It is obvious therefore that they themselves can learn nothing new from such forms of reasoning” (AT 10.406).

²⁶ For the former, see E IV.ii.2–3. For the latter, see IV.i.2.

²⁷ See T 1.3.3.1–3 for an important argument of Hume’s that relies on intuition and demonstration being the only two ways to achieve knowledge.

²⁸ As Owen puts it, “Two ideas are demonstratively related if the relation between them is conceived, not immediately, but via other intermediate ideas. The link between each pair of adjacent ideas in the resulting chain must be intuitive” (*Hume’s Reason* (Oxford: Oxford University Press, 1999), 9). For a concise description of how demonstrations are structured, see Owen, *Hume’s Reason*, 93–99.

²⁹ For Hume’s discussions of intuition, see T 1.3.7.3, 3.1.1.18–21, and EHU 4.16–21.

³⁰ For Hume’s rejection of direct realism, see T 1.4.2.

³¹ Thus, the knowable relations are what are nowadays called “internal relations.” See Fraser MacBride, “Relations,” in *Stanford Encyclopedia of Philosophy*, ed. Edward Zalta (Stanford: Metaphysics Research Lab, Stanford University, 2016), for discussion of recent attempts to make this notion precise. Both Graciela De Pierris, *Ideas, Evidence, and Method: Hume’s Skepticism and Naturalism concerning Knowledge and Causation* (Oxford: Oxford University Press, 2015), 12, 97–110, and Jani Hakkarainen, “Why Hume Cannot Be A Realist,” *Journal of Scottish Philosophy* 10, no. 2 (2012): 143–61, explicitly apply this term to Hume’s knowable relations. See also Jonathan Cottrell, “Minds, Composition, and Hume’s Skepticism in the Appendix,” *The Philosophical Review* 124, no. 4 (2015): 533–69, 544fn29.

³² For relevant cases where Hume uses “infallible” and its cognates, see T 1.3.1.5, 1.3.3.2, and 1.4.1.1. For relevant cases where Hume uses “certain” and its cognates, see T 1.3.1.2, 1.3.1.5, 1.3.1.6, 1.3.3.1, 1.3.3.2, 1.3.3.3, 1.3.3.8, 1.3.6.7, 1.3.6.8, 1.3.12.14, and so on.

³³ See also T 1.1.7.6 and Abs 11.

³⁴ See, e.g., T 1.3.6.1, 1.3.9.10, 1.3.14.13, and EHU 4.2.

³⁵ In fact, Owen, the foremost authority, argues that “the relation of proportions in quantity or number [is] the only relation susceptible of demonstration” (*Hume’s Reason*, 93).

³⁶ See also T 1.3.7.3, 1.3.9.10, and Abs 4.

³⁷ For more on this argument, see Butler, “Hume’s Causal Reconstruction of the Perceptual Relativity Argument in *Treatise* 1.4.4,” and Fissette, “Hume on the Lockean Metaphysics of Secondary Qualities,” 107–108, 113.

³⁸ Or, more accurately, if not p , not q , not r , and not s , then not p , since perceptions of bodies are *not*, by Hume’s argument in T 1.4.4, perceptions of things instantiating sounds, tastes, or smells.

³⁹ Note that the necessity of these claims does not conflict with the inverse of the Conceivability Principle (that inconceivability implies impossibility), a view that some attribute to Hume. For instance, it follows from this view, P3, and some logical equivalences, that it is necessary that it is not the case that there are extended bodies that lack qualities characterizing what they are like in themselves and not in relation to other things. This consequence is compatible with it being necessary that it is inconceivable (and so impossible) that there are extended bodies that lack such qualities. The same goes for the other claims composing the argument in T 1.4.4.

⁴⁰ See T 1.3.1.1–2. Those who agree that these relations are the objects of Humean knowledge include Kingsley Blake Price, “Does Hume’s Theory of Knowledge Determine his Ethical Theory?” *The Journal of Philosophy* 47, no. 15 (1950): 425–34, 427; David Owen, “Locke and Hume on Belief, Judgment and Assent,” *Topoi* 22 (2003): 15–28; Kevin Meeker, “Hume on Knowledge, Certainty, and Probability: Anticipating the Disintegration of the Analytic/Synthetic Divide?” *Pacific Philosophical Quarterly* 88 (2007): 226–42, 28; Frederick Schmitt, *Hume’s Epistemology in the Treatise: A Veritistic Interpretation* (Oxford: Oxford University Press, 2014), 12, 65–66; De Pierris, *Ideas, Evidence, and Method*, 97–110; Don Garrett, *Hume* (New York: Routledge, 2015), 42, 51–52, 92; Ainslie, *Hume’s True Scepticism*, 21; and Peter Millican, “Hume’s Fork, and his Theory of Relations,” *Philosophy and Phenomenological Research* XCV, no. 1 (2017): 3–65, 17–27, among others. For dissent, see John P. Wright, *The sceptical realism of David Hume* (Manchester: Manchester University Press, 1983), 85–92.

⁴¹ See T 1.1.5.8 and EHU 3.3n6. Note that it is not clear if Hume has the same view on contrariety across these two works. For discussion, see Lewis Powell, “Hume’s Treatment of Denial in the Treatise,” *Philosophers’ Imprint* 14, no. 26 (2014): 1–22.

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