In several early 19th-century works, Mary Shepherd presents a sustained attack on Hume’s theory of causation. She is responding to renewed interest in Hume at the time, and shares with many of her contemporaries a fear that Hume’s views “lead directly to a scepticism of an atheistical tendency, whose dangerous nature can require no comment” (ERCE 4). The danger she has in mind is that Humean skepticism undermines rational religion and thereby morality, but saving religion from the specter of Humeanism is not Shepherd’s main goal. And although she presents her main work as an argument against Hume, this presentation is somewhat misleading: her ultimate goal is to advance her own positive philosophical views. Like Reid and Kant, Shepherd aims to refute Hume by providing a better alternative.

Shepherd’s alternate theory of causation and induction involves three principles about the nature of causation:

1. All causation involves the conjunction of at least two objects.²
2. Cause and effect are not distinct entities.
3. Cause and effect are always simultaneous.

It also involves three principles about natural kinds:

1. The anonymously published 1819 *Enquiry respecting the Relation of Cause and Effect* (Enquiry), which is standardly attributed to Shepherd; the 1824 *Essay upon the Relation of Cause and Effect, controverting the Doctrine of Mr. Hume, concerning the Nature of that Relation; with Observations upon the Opinions of Dr. Brown and Mr. Lawrence, connected with the same subject* (ERCE); and the 1827 *Essays on the Perception of an External Universe and Other Subjects Connected with the Doctrine of Causation* (EPEU). All three are included in Shepherd’s *Writings* (Shepherd 2000) and cited by page number in the *Writings*. I refer to one other of Shepherd’s texts that is not in her *Writings*: the 1832 article “Lady Mary Shepherd’s Metaphysics” (*LMSM*), which is cited by page number in the original.

2. Shepherd recognizes that this might raise problems for divine creation: if all causation is mixture, then the “one uncaused essence”, God, should not be able to cause anything at all. She replies that “the uncaused essence, however mysterious in his nature, and however awful and distant to our speculations, must nevertheless have attributes; or in other words, its own peculiar qualities, which required no former beings, to give birth to them” (ERCE 96).
(4) There are sharp natural kind boundaries in nature.

(5) Kind membership is not determined by sensible qualities alone but by causal powers.

(6) Like causes (by which Shepherd means, roughly, objects of the same kind) necessarily have like effects.

It follows from these principles that nature is uniform. And since Shepherd argues that all six principles can be known—indeed, that our everyday belief in them constitutes knowledge—it also follows that we can have knowledge of the uniformity of nature and that our everyday causal and inductive beliefs typically count as knowledge.

In this paper, I lay out Shepherd’s theory of causation, induction, and natural kinds against two important pieces of background: the science of the day, and her conception of her place in the tradition of British philosophy. This helps us understand Shepherd’s theory and the force of her reply to Hume. It also helps us respond to a common concern, that Shepherd has missed the point of Hume’s skepticism. Rather, I argue, she is operating with a very different set of theoretical assumptions.

Before I begin, two caveats. First, the last two terms in the title of this paper are anachronistic. None of the three philosophers I discuss use the term ‘natural kind’, which came into use late in the 19th century, and only Shepherd uses the term ‘induction’ regularly.3 I am pretty sure this particular anachronism is harmless: no one, so far as I know, denies that Locke is talking about natural kinds when he discusses real and nominal essences, or that Hume is talking about induction. Second, when I discuss the way Shepherd reads Locke and Hume, I am not endorsing either of those readings; I am simply trying to understand how she sees herself in relation to her tradition. Shepherd reads Hume as holding “that there is no productive principle, that there is only antecedency and subsequence of events of an arbitrary kind” (EPEU 296). On her own view, what it is for a relation to be genuinely causal is for it to involve a productive principle and hence a necessary connection. What Hume calls causation is not worthy of the name. So, Shepherd thinks, Hume is rejecting genuine causation. This was not an uncommon way to read Hume at the time, although Hume’s readers today typically see him as offering a new analysis of causation rather than eliminating it entirely.

II

I’ll start with how Shepherd situates her views in relation to the science of the day. Shepherd was born a year after Hume died, and where Hume modeled his science of the mind on Newton’s physics, Shepherd seems to take chemistry as her model.4 In an anonymously published work that is standardly attributed to her, Shepherd remarks:

The science of chemistry has now discovered that the whole of the universe that is within the reach of experiment is composed of a few elementary substances; and there is reason to suspect that these substances which we term elementary, may perhaps be compounds, and reduced to fewer still, if the methods of analyzing them were discovered. In considering causation, I have therefore been led to consider the world as one whole, composed of a few elementary parts … the whole of the qualities and properties, or powers of matter, are derived from the qualities, properties, and powers of these elementary substances. (Enquiry 45–46)

Two features distinguish this matter theory from the various sorts of mechanism that preceded it. One is the claim that there are a few elementary substances, as opposed to the one uniform homogeneous matter of the various versions of the mechanical philosophy. The other

3. Locke does use the term, in something like our sense, in another context (Conduct §13 in Works, vol. 2).

4. See Paoletti 2011, 57 for a similar suggestion.
is that the causal process which is foregrounded is compounding rather than the interaction of parts via motion.

Shepherd does not say who is responsible for the discovery she mentions, and it is difficult to be sure precisely what she has in mind. She does not discuss any individual chemists, and her later works contain only a few chemical references. However, she may be thinking of John Dalton, who is standardly taken to have provided the first modern formulation of atomic theory. Dalton is a good candidate for two reasons. First, his theory resonates with what Shepherd says about chemistry better than the other possibilities. Second, although I cannot show that she did know Dalton’s work, I can at least show that she could have.

According to her daughter, Shepherd “wrote, I cannot say how many, M.S. books full of metaphysical disquisitions exposing errors in the reasoning of Hume’s atheistical treatises” (Brandreth 1886, 29) before her marriage in 1808. These notebooks are, in one form or another, the ancestors of Shepherd’s later works. When she was writing them, she was in her late twenties, or perhaps thirty, living mainly at the family estate outside Edinburgh (McRobert 2002/2014, 44). Dalton presented his theory in a series of public lectures in Edinburgh and Glasgow in the spring of 1807 (Partington 1970, 3, 797). These lectures were very well received — so well received, in fact, that Dalton dedicated his book to the “Professors of the Universities, and other residents, of Edinburgh and Glasgow” (Dalton 1808, 1.iii). Since Shepherd was attuned to events among Edinburgh’s intellectual elite (McRobert 2002/2014, 32–43), she was likely aware of Dalton’s work while she was first thinking about causation. In addition, she might have encountered Dalton’s work and its importance later, after her marriage and subsequent move to London, as she was preparing her books for publication. Shepherd was a close friend of Charles Babbage (McRobert 2002/2014, 49), who arranged for the support of Dalton’s research (Henry 1854, 173).

A second reason to think that Shepherd has Dalton’s atomic theory in mind is that although talk of elements and their decomposability was widespread at the beginning of the 19th century, Dalton’s emphasis on describing elements in terms of their characteristic powers was not. Thus, his system fits Shepherd’s description of chemistry as having discovered “that the whole of the universe … is composed of a few elementary substances” much better than others.

Like ancient and early modern atomists, Dalton holds that atoms — which he also calls elements, elementary principles, simple substances, and ultimate particles — are small indivisible particles. These particles cannot naturally be created or destroyed, and thus they always remain intact when they enter into chemical reactions. Dalton distinguishes a number of varieties of atoms: hydrogen, oxygen, nitrogen, and so on (Dalton 1808, 2.222). He describes the different types in large part by explaining their causal powers. Hydrogen in gas form, for instance, is extremely light; it is fatal to any animal that breathes it; it is flammable; it bears electrification; and so on (Dalton 1808, 2.228–231). At the same time, Dalton is careful to note that his list of elements is

3. At least not qua chemist. Shepherd does spend quite a lot of time discussing Priestley, especially in the 1827 EPEU, but she is concerned with him only as a metaphysician and theologian.
4. See e.g. ERCE 44 and 46 and EPEU 360–365.
5. The theory was first published in the 1808 New System of Chemical Philosophy.
provisional. He explains that we “do not know that any one of the bodies denominated elementary, is absolutely indecomposable” (Dalton 1808, 2.221). Dalton argues that the elements and their simple composites fall into sharply bounded natural kinds, each of whose individual members are exactly alike:

Whether the ultimate particles of a body, such as water, are all alike, that is, of the same figure, weight, &c. is a question of some importance. From what is known, we have no reason to apprehend a diversity in these particulars: if it does exist in water, it must equally exist in the elements constituting water, namely, hydrogen and oxygen. Now it is scarcely possible to conceive how the aggregates of dissimilar particles should be so uniformly the same. If some of the particles of water were heavier than others, if a parcel of the liquid on any occasion were constituted principally of these heavier particles, it must be supposed to affect the specific gravity of the mass, a circumstance not known. Similar observations may be made on other substances. Therefore we may conclude that the ultimate particles of all homogeneous bodies are perfectly alike in weight, figure, &c. (Dalton 1808, 1.142–143; italics his)

Sameness of weight is necessary and sufficient for sameness of atomic type. And there are similarly clean individuation conditions for compounds: to be a water molecule, for instance, is to be made up of two hydrogen atoms and one oxygen atom. In this chemical picture of the world, nature is carved at the joints. The members of the fundamental natural kinds are identical, and in like circumstances, they must behave alike.

Mary Shepherd on Causation, Induction, and Natural Kinds

Shepherd’s remark that the science of chemistry has led her to “consider the world as ... composed of a few elementary parts” helps us understand her theory of causation in several different ways. It gives us a plausible example of her defining case of causation. It helps us see the appeal of her view that there are precisely delineated natural kinds. And, as I’ll explain in section III, seeing her theory in the context of the science of the day helps us make sense of her puzzling attempt to enlist Locke’s views on natural kinds as support.

Philosophers over the centuries have taken very different sorts of things to be the paradigm or defining case of causation. Christian Platonists, for instance, think of divine creation as the defining case of causation (Wilks 2014). Mechanical philosophers seem to think of the transmission of motion in impact as the defining case of causation, and Hume sometimes seems to have inherited this way of thinking from them. If you think of impact as the defining case of causation, then it will seem very natural to think, as Hume does, that causation is a relation between two distinct entities. It will also seem very natural to think, as Hume does in the Treatise of Human Nature (although not in the Enquiry Concerning Human Understanding) that the effect must precede the cause (Treatise 1.3.14).

For Shepherd, I suggest, the defining case of causation is chemical synthesis — the combination of the atomic parts of matter into compounds. As Shepherd notes, this is a radically different picture of causation than the Humean one: “To represent the relation of Cause and Effect, as A followed by B, is a false view of the matter. Cause and Effect, might be represented rather by A×B; therefore C is included in the mixture of the objects called cause” (ERCE 141). This remark helps

10. One and one, according to Dalton (Dalton 1808, 2.75–76).
11. The same idea is found in Lavoisier, who insists that the distinctions between different species of compounds “are not, as some may imagine, merely metaphysical, but are established by Nature” (Lavoisier 1790, xxvii).
us see how well Dalton’s picture fits the six principles of Shepherd’s theory. Consider an example: nitrogen and hydrogen are compounded in the appropriate ratio to form ammonia. The cause is the conjunction of nitrogen and hydrogen, the effect is ammonia. So two objects are involved in the cause, nitrogen and hydrogen. That’s principle (1). Ammonia is not a distinct entity from the compound of hydrogen and nitrogen. That’s principle (2). And as a result, whenever you have the effect, ammonia, you always have hydrogen and nitrogen at the same time. That’s principle (3), cause and effect are always simultaneous.

Dalton’s picture also fits principles (4)–(6) beautifully. The chemical elements are natural kinds if anything is, and the boundaries between them are perfectly sharp. Elements are individuated by their causal powers. Thus, each atom of nitrogen or molecule of ammonia has the same effects as any other in the same circumstances.

III

In the course of her objections to Hume, Shepherd says that she has “met with some passages in the works of Mr. Locke, which ... must be considered as forming the basis of [Hume’s] elaborate and inconclusive reasoning” (ERCE 117). This is surprising, because Hume’s views on causation are not usually read as responses to Locke. What’s more surprising is that the passages Shepherd has in mind concern real and nominal essences. On the face of it, these passages have nothing to do with causation or induction.

Here’s one of Locke’s passages in Essay Concerning Human Understanding (ECHU) that Shepherd refers to:14

That which I think very much disposes men to substitute their names for the real essences of species, is the supposition before mentioned, that nature works regularly in

the production of things, and sets the boundaries to each of those species, by giving exactly the same real internal constitution to each individual which we rank under one general name. Whereas anyone who observes their different qualities can hardly doubt, that many of the individuals, called by the same name, are, in their internal constitution, as different one from another as several of those which are ranked under different specific names. (ECHU 3.10.20)

Shepherd thinks Locke’s worry is epistemic. It “regards the difficulty there is in the detection of like objects, on account of our inability to form a judgment concerning their internal constitutions from the mere appearance of their sensible qualities” (ERCE 117). This is a legitimate concern on Shepherd’s view: it is sometimes hard to tell whether two things that look alike are really members of the same kind, and we sometimes make the wrong judgment about this. I’ll return to this issue in the context of Shepherd’s own theory in section VI below.

But although Locke’s concern is legitimate, Shepherd thinks he “renders the difficulty something greater than it need be” (ERCE 117). Here’s why. Locke holds that objects have real constitutions, internal corpuscularian microstructures on which their sensible qualities depend. As a result, Shepherd explains, he “acknowledges that a similarity in the sensible qualities forms an argument of high probability, (though short of demonstration,) in favour of the presence of truly similar objects” (ERCE 117).15 In addition, Locke recognizes that our classifications take behavior into account as well as sensible qualities. Thus, Shepherd argues,

Mr. Locke ... merely meant to say, that nature in her regular and usual modes of operation from Cause and Effect,

14. Shepherd quotes a slightly abbreviated version of the passage, with a few inaccuracies; this is typical for her, and does not affect the sense in this case. I’ve provided the original.

15. Locke himself seems to grant this in a passage from the Stillingfleet correspondence: “where we find all the same properties, we have reason to conclude there is the same real, internal constitution, from which those properties flow” (to Stillingfleet: Works 4.91).
might form irregular collections of qualities not to be detected by mere appearances, and therefore unworthy, on that account only, of retaining the names of regular species, which are also named on account of their tried effects and properties. (EPEU 127)

To speak of qualities depending on internal constitutions is “to acknowledge the relation of Cause and Effect” (ERCE 116). And it only makes sense to think that likeness in sensible qualities and behavior is evidence of likeness in internal constitution if you already assume that like causes must have like effects. Thus, Locke must think that apparent differences of species only take place “by the regular operations of causes necessarily connected with their effects” (ERCE 115).

On Shepherd’s view, Locke’s examples of monsters — beings that transgress species boundaries — are not intended to cast doubt on the existence of sharply delineated natural kinds. They are intended to show something much weaker: that our everyday classifications, which are based solely or mainly on sensible qualities, fail to map onto sharply delineated natural kinds. Classifications based on underlying microstructure or causal powers might fare quite differently.

The following passage in Locke supports Shepherd’s reading, although she does not mention it:

[T]hat we find many of the Individuals that are ranked into one Sort, called by one common name, and so received as being of one species, have yet Qualities depending on their real Constitutions, as far different one from another, as from others, from which they are accounted to differ specifically. This, as it is easy to be observed by all, who have to do with natural Bodies; so Chymists especially are often, by sad Experience, convinced of it, when they, sometimes in vain, seek for the same Qualities in

one parcel of Sulphur, Antimony, or Vitriol,16 which they have found in others. (ECHU 3.6.8)

From the point of view of the 19th century, this is no evidence at all against the existence of natural kinds or elements. It is simply evidence of the inadequacy of 17th-century chemistry. (Perhaps the two parcels of antimony contained different impurities.) And thus, Shepherd concludes, “every man acquainted with Mr. Locke’s writings must consider him as far from wishing to authorize in future times such a scheme as that of Mr. Hume’s” (EPEU 127). Locke’s monsters are not like Hume’s hot snow, a phenomenon whose very conceivability is thought to undermine the principle that like causes must have like effects. Their occurrence is simply evidence that nature is complex and that we do not always grasp its true structure.

IV

Why does Shepherd care whether Locke’s writings authorize such schemes as Mr. Hume’s? One reason is that Locke had an great deal of authority in early 19th century Britain.7 Shepherd is said to have claimed to have “read and mastered Mr. Locke’s profound treatise at eight years old” (Jeckyl 1894, 217). While this is obviously an exaggeration, it is still suggestive, and what it suggests is not just Locke’s general prestige but also Shepherd’s particular admiration for him.18

16. “Sulphur” may refer to the element sulfur, but it is also one of the three principles — salt, sulphur, and mercury — from which all things are made, according to certain chemical theories. “Antimony” is antimony sulfite, the mineral stibnite. “Vitriol” could be sulfuric acid, sometimes called “oil of vitriol” or vitriol for short, but it could also, as in Locke’s friend Newton, refer to one of a number of crystalline, metallic salts (Newman 2018, xv).

17. Four editions of his Works were published between 1801 and 1826, and the 21st edition of the Essay was published in 1805. Shepherd’s friend Samuel Taylor Coleridge contemplated writing a work “on the originality and merits of Locke, Hobbes, and Hume”, in which he would argue that “the Reputation of those three men has been wholly unmerited”. Victor Cousin’s 1829 Cours de l’histoire de la philosophie consisted of 25 lectures, 11 of which were on Locke. See Aarsleff 1971 for further details.

18. She also reads Locke as supporting her own views on qualities, natures, and
As we saw, Shepherd thinks of Hume as undermining religion and morality. In contrast, she agrees with Locke’s views on ethics and religion, at least in broad brushstrokes. Hence, she thinks, “it is strange that a system at once so unstable and confused, as Mr. Hume’s, should ever have been built upon any notions of Mr. Locke, whose moral conclusions are so much at variance with his” (EPEU 129). Shepherd endorses the Lockean view of reason as what makes human beings special, in the face of its multiple late 18th- and early 19th-century challengers — most prominently Hume, but also Reid and Stewart, in addition to Condillac and other associationists. Thus, by making the case that a properly-understood Locke supports her views rather than Hume’s, Shepherd gains rhetorical support for her cause.

Shepherd also has a larger goal in view here. She aims to show that she — and not Hume, Reid, or Stewart — is the legitimate heir of the British tradition of natural philosophy. In the early 19th century, Bacon, Locke, and Newton were treated as the three great heroes of that tradition, and Shepherd attempts to enlist all three on her side. For instance, consider how she uses the notion of a crucial experiment (ERCE 193). This has an illustrious history in the intellectual tradition Shepherd shares with Hume. It was introduced by Bacon, Lord Verulam (who used the term instantia crucis) to describe an experiment that will allow us to decide between competing theories (New Organon 2.36). Boyle called Pascal’s barometer experiment on the Puy-de-Dôme “an experimentum crucis (to speak with our illustrious Verulam)” (Boyle 1772, 1.151). And Newton used the term in relation to his proof that white light is composed of different colors (Newton 1671/1672, 3077). Shepherd argues that if Hume were right, the notion of a crucial experiment would be absurd. More broadly, she argues, Humean theories cannot explain how we can arrive at knowledge of causal relations on the basis of a single trial — something everyone admits we can do. In contrast, Shepherd can easily explain the rationality of this process, as we’ll see in section VII below.

Along the same lines, Shepherd takes pains to show that her theories are compatible with Newtonianism. The issue here is her claim that the truths of physics are necessary, a point on which she disagrees with Hume, Reid, Stewart, and others. Newton famously said that “God may vary the laws of nature, and make worlds of several sorts, in different parts of the universe; at least, I see nothing of contradiction in all this” (Opticks, query 31: Newton 1979, 403). Shepherd is somewhat suspicious about the whole notion of laws of nature (EPEU 315n), at one point claiming that there is only one law of nature, like cause must exhibit like effect (EPEU 290). But she recognizes that her theory of causation will not be taken seriously if it cannot be reconciled with Newtonianism. Fortunately, it is easy for her to explain how God could vary the laws of nature. The way for God to create a world with

20. In support of the claim that everyone allows that we can gain knowledge from a single trial, Shepherd cites the article “Experimental Philosophy” from the Encyclopedia, the Scottish imitation of the Encyclopédie of Diderot and D’Alembert: “it is a matter of fact, a physical law of human thought, that one simple, clear, and unequivocal experiment, gives us the most complete confidence in the truth of a general conclusion from it to every similar case” (EPEU 273).

21. Hume argued that mathematics concerns relations of ideas and natural science concerns matters of fact (Enquiry Concerning Human Understanding 4.1–2). Stewart argued that “the evidence afforded by mathematical induction must be allowed to differ radically from that of physical” (Elements 2.4.3 in Stewart 21829, 2.307–308), because mathematical truths are necessary and can be known with demonstrative certainty, while the laws of nature are contingent and our beliefs about them are based on instinctive expectation. For Shepherd, in contrast, “the science of mathematics is truly but one branch of physics” (EPEU 278–279). This is because mathematics, like physics, relies on the principle that like causes must have like effects. Each time we add two and two, we get four. Each time we examine a right-angled triangle, we see that it has the Pythagorean property. A mathematical proof, like an experiment, “proves the relations of every other formed after a similar fashion in every different time and place” (EPEU 285). Thus, physics and mathematics form “but one science — one drawn from the bosom of that nature, whose leading principle is to exert a cause for every effect” (LMSM 707).
different laws of nature is for him to create objects with different causal powers — that is, different objects *(EPEU 289; see also LMSM 707)*.

With this background in place, let us turn to Shepherd’s reply to Hume. Many of Hume’s readers think that his central mistake is being so confident that conceivability guarantees possibility. Shepherd, however, accepts that conceivability is a guide to possibility. She thinks the problem is that Hume misunderstands what’s conceivable in the first place. Hume, for instance, claims that we can conceive of oak trees that sprout new leaves in winter and drop their leaves in summer. Shepherd argues that this is not genuinely conceivable:

There cannot be a more unintelligible proposition than to assert of those trees, which have usually flourished in May and June, that they may cease to do so, and only thrive in December and January.

So far from the mind being able distinctly “to conceive” such a change in their qualities, when the proof has once been afforded, that it is their nature to require warmth for their growth; and that cold kills their blossoms; it must be ever after considered impossible for these objects to affect qualities not originally included in their natures. *(ERCE 81)*

It is impossible for an oak tree to sprout new leaves in winter. We may think we can imagine this possibility, but what we are imagining is actually something that looks like an oak tree but has very different biology. Anyone who understands the biology of oak trees will be able to see that it is impossible for them to sprout new leaves in winter. Or go back to the earlier example. If you understand a little chemistry, you will be unable to conceive of a compound of nitrogen and hydrogen (in the correct ratio) that is not ammonia. “Like causes necessarily include, and therefore produce and exhibit their Effects”, and so “the mind can never consider them as possible to exist apart in nature” *(ERCE 112)*.

Mary Shepherd on Causation, Induction, and Natural Kinds

Shepherd’s underlying disagreement with Hume concerns the individuation of natural kinds. She reads Hume as thinking that two objects are like or of the same kind just in case they have the same sensible qualities *(ERCE 73)*. She points out that Hume tends to go back and forth between talk of like objects and talk of objects with like sensible qualities. She also points out that he tries to show that we cannot know the effects of things *a priori* by arguing that we cannot infer the effects of things from their sensible qualities. This is evident in passages like the following:

Adam, though his rational faculties be supposed, at the very first, entirely perfect, could not have inferred from the fluidity and transparency of water that it would suffocate him, or from the light and warmth of fire that it would consume him. *(Enquiry 4.1)*

Present two smooth pieces of marble to a man who has no tincture of natural philosophy; he will never discover that they will adhere together in a direct line, while they make so small a resistance to a lateral pressure ... nor does any man imagine that the explosion of gunpowder ... could ever be discovered by arguments *a priori*. *(Enquiry Concerning Human Understanding 4.1)*

Once the assumption that likeness is just likeness in respect of sensible qualities is made explicit, it’s pretty implausible. But in any case, Shepherd gives three reasons to reject it.

First, the distinction between the sensible qualities of an object and its effects is perceiver-dependent:

[A] blind man may call the object which warmed, or burned him, fire; but his eyes being supposed suddenly to open, he would consider the flame and its brilliant color as the effects of fire, whilst he who sees fire constantly,
being able always to take notice of its flame and colour, considers them as the constant and unvarying qualities of fire ... but the quality of burning, which he does not constantly experience, he names an effect or consequence of fire. (ERCE 52–53)

If there is no consensus about which things are sensible qualities and which mere effects, then it’s hopeless to insist that only sensible qualities matter for kind membership.

Second, the sensible qualities of an object are just a subset of its effects:

> Objects, when spoken of and considered as causes, should always be considered as those masses of unknown qualities in nature, exterior to the organs of sense, whose determination of sensible qualities to the senses forms one class of their effects. (EPEU 127)

This explains why different observers disagree about which things are sensible qualities and which mere effects. To be brown or to smell smoky is to have the power to affect the human sensory apparatus in a certain way. But why should kind membership be determined by a thing’s powers to affect the human sensory apparatus alone? Why not also use its powers to affect the canine sensory apparatus, or the human digestive system? Why not use all its powers?

Third, Shepherd argues, Hume’s assumption that kind boundaries are determined by sensible qualities alone is incompatible with our ordinary practice. In everyday life, we determine what kind of thing we’re dealing with by determining what it does, as well as what it looks like — or, to be precise, by what it does, including what it looks like.

And we are quite right to take into account an object’s causal powers when we determine what kind it is a member of: “Fire, in order to deserve the name it bears, must comprehend all its qualities tried and untried; observed and unobserved ... an object is nothing else (in relation to us,) than a mass of peculiar qualities” (ERCE 54; cf. ERCE 64, ERCE 110). Thus, it’s “part of the definition of fire to burn certain bodies, to melt others; of bread to nourish the human body; of snow to be cold, and white” (ERCE 55). Hot snow is not snow at all.

If this is right, then the various scenarios Hume finds conceivable are not genuinely conceivable:

> Were a body, in all other respects resembling snow, to have the taste of salt and feeling of fire, it would be an extraordinary phaenomenon, no doubt; and one which might for aught we know take place, but it would not be snow ... it would, therefore, be entirely a different object, and would require a new name; and the phaenomenon could offer no ground for the conclusion, that reason does not afford an argument, for the expectation of similar effects from similar causes. (ERCE 69)

We cannot conceive of snow that feels hot, because it’s a necessary truth that snow is cold. We cannot conceive of fire that fails to burn the combustible materials placed in it, because being able to burn various things is essential to fire. Thus, Hume’s argument does not even get off the ground.

VI

Shepherd’s readers sometimes worry that she has not solved Hume’s problem so much as just relocated it. Grant that snow is necessary-object’s causal powers or just a subset of them, and if so, how we decide what the relevant subset is. Shepherd cannot possibly think that any two loaves of bread, or any two fires, have all the same powers. However, she may well think that any two oxygen atoms have all the same powers, as Dalton claims. Here, the idea that the elements are the paradigmatic natural kinds is again helpful.

22. Shepherd does not feel the need to give much in the way of argument for this; presumably she thinks her contemporary readers will already accept it.

23. It’s a difficult issue whether we are supposed to take into account all of an object’s causal powers or just a subset of them, and if so, how we decide what the relevant subset is. Shepherd cannot possibly think that any two loaves of bread, or any two fires, have all the same powers. However, she may well think that any two oxygen atoms have all the same powers, as Dalton claims. Here, the idea that the elements are the paradigmatic natural kinds is again helpful.

24. Cf. Walter Ott:

> I cannot see how this is supposed to help solve Hume’s epistemic (as
ily cold and that it is impossible for hot snow to fall next winter. Still, couldn’t some hot fluffy white crystals fall from the sky tomorrow? And isn’t that just as bad?

Another way to put the worry is that Shepherd’s theory guarantees knowledge of principle (6), that like causes have like effects, only at the cost of making it trivial. If two objects do not have like effects in like circumstances, then ipso facto they are not genuinely like. But how do we know when two objects are alike? This is easy for Hume, but — so the objection has it — difficult, even impossible, for Shepherd. For her view, it seems, we cannot know whether two objects are genuinely alike unless we first know how they would behave in all possible circumstances.

Shepherd anticipates the objection:

If it should be asked … how it is known when objects are similar upon any two occasions — the sensible qualities may be the same, and not the secret powers on which the effects depend — I answer, this is to shift the question from the examination of like causes supposed to the consideration of the method whereby their presence may be detected. (ERCE 60)

The question of how like causes can be detected means different things in different contexts. Shepherd addresses it as a practical and scientific question, not a skeptical question. How can I tell, for instance, whether the glass on the kitchen counter contains water or sulfuric acid? One

option is just to examine it more closely. If the liquid is syrupy, it’s not water. A second option is to experiment with it, to see how it behaves in different circumstances. If a slice of lemon in the glass appears unaffected, it’s not sulfuric acid.

Moreover, we often know something about the origin of the objects we’re dealing with, and we can use this knowledge to help us determine whether the objects in question are genuinely alike:

The mind has always a regard to the method taken by nature and art in the formation of an object. When these are similar, the masses of Effects, or objects, are necessarily similar … we trace the sensible qualities of bread to the secret constitutions which have partly been put in action, by the sower and reaper of corn, the operations of the miller and the baker; and beyond these to the influence of the air, the sun, and the juices of the earth … None ever suppose, that it is what is first seen and felt — that it is colour and consistency which afterwards nourishes. – They suppose it is that which is sown and reaped, and kneaded and baked; which seen, or unseen; touched or untouched; is fitted to nourish … The sensible qualities are only considered as signs of the secret powers — which secret powers are understood to be determined by certain similar processes of art, mixed with the grand and regular operations of nature. When the formation of objects can be less accurately detected; their similarity of internal constitution becomes more doubtful. (ERCE 119–123)

Consider the baguette I bought this morning. I believe that it will be delicious, with a thin, crisp crust and an elastic crumb, like the one I bought yesterday. Why do I believe this? One reason is that today’s baguette looks and smells like yesterday’s baguette. But another reason is that I got them from the same bakery and hence know that they were made from the same ingredients, using the same process:
It is not the mere appearance of the external qualities, which can determine the mind to expect certain effects; it is only that appearance in conjunction with the recollection of the probable causes, that have produced the objects in question, and which lead the mind to suppose the said objects to be truly bread, water, or hartshorn; and therefore impossible not to be capable of exhibiting all their qualities, and none other than their qualities. (ERCE 102)

This way of telling whether today’s baguette will taste like yesterday’s is not, of course, foolproof. Maybe the baker has decided to dramatically change the recipe of her most successful product. Maybe she has taken a dislike to me and sold me a perfect replica of a baguette made out of scented Styrofoam. Maybe I am being deceived by Descartes’ evil demon. But none of these is relevant in the context of a reply to Hume.

More generally: say we are trying — to use Locke’s example — to discover whether two parcels of a substance that we believe to be antimony are really the same. There are various techniques we can use. We can examine the two parcels more closely, we can experiment to see how they behave in different circumstances, and we can use our knowledge of their origins. These methods are usually successful, but they are not foolproof. This is as it should be, on Shepherd’s view: we do in fact make mistakes, both in science and in everyday life. What Shepherd is trying to do is to establish that we use reason to arrive at our beliefs about future or unobserved causal relations. This does not require establishing that such beliefs are always true or always justified.

VII

On Shepherd’s view, that fire consumes its fuel and that oak trees bloom in spring are necessary truths. They are necessary truths even though “a priori, we know not what particular effect may arise as the result of any given cause” (EPEU 237). Hence Hume’s distinction between matters of fact and relations of ideas is not exhaustive, and the argument that relies on it fails.

Shepherd also holds that it’s a necessary truth that like causes have like effects. But the epistemic status of that necessary truth is very different. We need experience to know that snow is cold or that ammonia is made of nitrogen and hydrogen. But we don’t need experience, on Shepherd’s view, to know that like causes must have like effects. We just need to understand what causation is:

[C]ausation is necessary not arbitrary; and though the nature of any particular effect requires to be ascertained by experience, yet it is reason must show its necessary connection with its cause, as opposed to its arbitrary or accidental connection with it ... and the knowledge of its invariability of connection for the future, as opposed to the mere experience of its conjunction in past time. (EPEU 294)

This is why we can come to know the causal powers of things by a single trial. If I put my hand in the flame once, I will be certain that fire has the power to burn. I do not need to do this over and over again:

This is an argument, which all persons, however illiterate, feel the force of. It is the only foundation for the demonstrations of the laboratory of the chymist: which all life resembles, and so closely, in many instances, that the philosopher, and the vulgar, are equally sure of what cause is absolutely necessary to the production of certain effects. (ERCE 44)

Moreover, Shepherd argues, when we do make use of multiple trials, “it is in order to detect the circumstances, not to lay a foundation for the general principle, that a LIKE Cause repeated, a LIKE Effect will take place” (ERCE 44n).
According to Hume, experience of a single case does not — and, on Shepherd’s reading, should not — bring about causal beliefs:

The conclusions which [reason] draws from considering one circle are the same which it would form upon surveying all the circles in the universe. But no man, having seen only one body move after being impelled by another, could infer that every other body will move after a like impulse. All inferences from experience, therefore, are effects of custom, not of reasoning. (Hume, Enquiry Concerning Human Understanding 5)26

Shepherd thinks this is simply a mistake. Hume claims that nobody would believe that impact affects all bodies in the same way after seeing one collision. This is plausible, but it does not show that experience of a single case is insufficient to produce causal belief. It just shows that you have to be careful about how you describe the case. She explains that

Mr. Hume’s error … consists, in making an incomplete comparison … Every body is taken in an indefinite sense for every kind of body; but circle is not taken for every kind of figure … [U]pon the first study of Mathematical science, I found much difficulty in a philosophical objection I could not easily answer; namely; that the relations of the quantities in one figure did not seem necessarily applicable to all of a like kind; until I perceived that the affections of all, were involved in one of each kind; as there was nothing to occasion a difference amidst their relations. Now then let the data be the same, and the impulse given not only be like, but the body given be like; and I conceive that every man, and every child, would expect, upon a second trial, that the body would move in the same manner as before. (ERCE 91–93)

Say I see that the cue ball hits the eight ball and then the eight ball rolls off with a certain speed and in a certain direction. I will not form the belief that impact affects all bodies this way. (I will not, for instance, think that the impact of the cue ball would have the same effect on a glass of water.) But I might very well form the belief that impact affects all pool balls this way. The difference is that we believe that all pool balls are alike in the relevant respects (mass, elasticity, etc.), just as we believe that all triangles are alike in the relevant respects.

VIII

I’ve argued that Shepherd’s response to Hume should be read in light of the science of the day and her conception of her place in the British philosophical tradition. Reading Shepherd’s response to Hume in light of her conception of her place in that tradition — and in particular her claim to be the real heir of Locke — illuminates the broader context of her attempt to re-center reason as the source of scientific knowledge, in the face of Hume’s attack. It also illuminates the connections she sees between induction and natural kinds. Reading Shepherd’s response to Hume in light of the science of the day helps make plausible her claim that there are robust natural kinds in nature, defined by their causal powers: this is precisely what then-recent advances in chemistry held. It also provides us with a model of her theory.

I have not been able to explain all the details of Shepherd’s theory in a short paper. I have also not attempted to assess its success or failure, although I have tried to present it in a favorable light. My goal has simply been to show that Shepherd’s theory of causation and the system of metaphysics and epistemology it relies on is fascinating and deserves further research.

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This is included in the 2000 *Philosophical Writings of Lady Mary Shepherd*, but the attribution to her is not certain.

