

Notes on Hume on Causation

Peter Millican, Hertford College, Oxford

1. “Of the Idea of Necessary Connexion”

The sections most focused on causation are entitled “Of the Idea of Necessary Connexion”: *T* 1.3.14 and *E* 7:

- Both discussions start from Hume’s empiricist “Copy Principle” (*T* 1.3.14.1, *E* 7.4), that all ideas are copies of impressions (or composites of ideas which are thus copied: *T* 1.1.1.3-12, *E* 2.5-9).
- Hume seeks the *impression* from which the crucial *idea* – of causal power or *necessary connexion* – is copied, and he identifies this as an impression of *reflection* which arises in our minds when we make a customary inference (thus linking with his prior discussions of induction, cf. *T* 1.3.6.3, 12-15; *E* 5.3-6).
- Sometimes Hume talks of this impression as a *feeling* (as would be expected if it is an impression of reflection). But often he talks as though the impression is *the inductive inference itself*. Thus in the *Treatise* he repeatedly uses the phrase “determination of the mind” (*T* 1.3.14.20, 23, 25, 26, 29, 33), but in the *Enquiry* he drops this, perhaps because it has circular *causal* overtones,¹ and refers instead to “customary transition” of the imagination or mind (*E* 7.28, 29, 30; also in the *Treatise* at *T* 1.3.14.24).
- Having identified the impression, he presents two “definitions of cause” (*T* 1.3.14.31, *E* 7.29), the first of which is framed in terms of *constant conjunction* between one type of thing (the “cause”) and another (the “effect”), and the second in terms of the *mental inference* (“customary transition” etc.).
- The relationship between the two definitions is not clarified, and leaves Hume’s position on causation extremely unclear. Most fundamentally, the first definition looks *objective*, defining causation in terms of sequences of events, while the second looks *subjective* (in the sense of *observer-relative*),² depending not on event-patterns but on what goes on in the mind of an observer.

2. Relevant Later Texts

The paper Millican (2024, §§2-3) outlines the most prominent interpretations of Hume on causation – from his contemporaries to the present – and points out that previous scholarly debates have seriously neglected *later* discussions in the *Treatise* and *Enquiry*, where Hume explicitly *applies* his two definitions. These are:³

- The four “corollaries” of the definitions at *Treatise* 1.3.14.32-36 (§4.1 in the 2024 paper).
- The “rules by which to judge of causes and effects” in *Treatise* 1.3.15 (§4.2 in 2024).
- The materialist argument of *Treatise* 1.4.5.30-33 (§4.3 in 2024).
- The sections “Of liberty and necessity”, *Treatise* 2.3.1-2 and *Enquiry* 8 (§6 in 2024)

§5 of the 2024 paper highlights how in the first three of these discussions, *it is the first definition of cause which plays the dominant role in identifying causes* (indeed, the second definition doesn’t feature at all in *T* 1.3.15 or *T* 1.4.5.30-33). Moreover, there are many other passages where Hume not only stresses *constant conjunction* as the appropriate criterion, but also advocates *conforming our inferences accordingly*. Thus *Hume deprecates our naïve tendency to draw customary inferences in cases where there is no genuine constant conjunction*, implying again that the second definition should be given no independent weight here.

The sections “Of liberty and necessity” provide two parallel definitions of *casual necessity*, and go on to appeal to *both* definitions, probably because Hume’s concern here is not so much *to identify causal relations*, as *to circumscribe what we can properly understand by causal necessity*. Hence the “impression of necessary connexion” – the source of the crucial idea – features relatively strongly. But when arguing for determinism in the human sphere (at *T* 2.3.1.5-12 and *E* 8.7-16), the first definition continues to dominate even here.

¹ Hume shows awareness of the potential circularity of defining “cause” in terms that are themselves causal at *E* 8.25 n. 19.

² The terms “objective” and “subjective” are potentially very slippery, because the distinction can be interpreted in numerous different ways (e.g. “objective” can mean measurable, precise, non-mental, external, unbiased, public, universal).

³ This list is complete, as confirmed by textual searches for references to the definitions and to “constant conjunction” etc.

3. Twenty “Objectivist” Quotations about Causation

(a) Experienced Constant Conjunction as Evidence of Causation

- (1) “This connexion or constant conjunction sufficiently proves the one part to be the cause of the other” (T 1.3.12.16)
- (2) “all our reasonings concerning causation are deriv’d from the experienc’d conjunction of objects” (T 1.3.14.36)
- (3) “This constant conjunction sufficiently proves, that the one part is the cause of the other.” (T 1.3.15.9)
- (4) “’tis only by our experience of [objects’] constant conjunction, we can arrive at any knowledge of [their causation]” (T 1.4.5.30)
- (5) “all objects, which are found to be constantly conjoin’d, are upon that account only to be regarded as causes and effects” (T 1.4.5.32)
- (6) “knowledge of cause and effect ... is not, in any instance, attained by reasonings *a priori*, but arises entirely from experience, when we find, that any particular objects are constantly conjoined with each other” (EHU 4.5-6)

(b) Constant Conjunction as Definitive of Causation

- (7) “We may define a CAUSE to be ‘An object precedent and contiguous to another, and where all the objects resembling the former are plac’d in like relations of precedency and contiguity to those objects, that resemble the latter.’” (T 1.3.14.31)
- (8) “as our idea of efficiency is deriv’d from the constant conjunction of two objects, wherever this is observ’d, the cause is efficient; and where it is not, there can never be a cause of any kind. ... If constant conjunction be imply’d in what we call occasion, ’tis a real cause.” (T 1.3.14.32)
- (9) “the constant conjunction of objects determines their causation ... that constant conjunction, on which the relation of cause and effect totally depends” (T 1.3.15.1)
- (10) “3. There must be a constant union betwixt the cause and effect. ’Tis chiefly this quality, that constitutes the relation” (T 1.3.15.5)
- (11) “the constant conjunction of objects constitutes the very essence of cause and effect” (T 1.4.5.33)
- (12) “we may define a cause to be *an object, followed by another, and where all the objects, similar to the first, are followed by objects similar to the second.*” (EHU 7.29)

(c) Regularity as “The Very Essence” of Power or Necessary Connexion⁴

- (13) “This multiplicity of resembling instances ... constitutes the very essence of power or connexion” (T 1.3.14.16)
- (14) “this uniformity forms the very essence of necessity” (T 2.3.1.10)
- (15) “this constancy forms the very essence of necessity, nor have we any other idea of it” (EHU 8.25 n. 19)

(d) The Two Definitions of Necessity

- (16) “Here then are two particulars, which we are to consider as essential to necessity, viz. the constant *union* and the *inference* of the mind; and wherever we discover these we must acknowledge a necessity.” (T 2.3.1.4)
- (17) “I DEFINE necessity two ways, conformable to the two definitions of *cause*, of which it makes an essential part. I place it either in the constant union and conjunction of like objects, or in the inference of the mind from the one to the other.” (T 2.3.2.4)
- (18) “Beyond the constant conjunction of similar objects, and the consequent inference from one to the other, we have no notion of any necessity, or connexion.” (EHU 8.5)
- (19) “being once convinced, that we know nothing farther of causation of any kind, than merely the *constant conjunction* of objects, and the consequent *inference* of the mind from one to another ... we may be more easily led to own the same necessity common to all causes” (EHU 8.21)
- (20) “Necessity may be defined two ways, conformably to the two definitions of *cause*, of which it makes an essential part. It consists either in the constant conjunction of like objects, or in the inference of the understanding from one object to another.” (EHU 8.27)

⁴ Two other passages, at T 2.3.2.2 and EHU 8.22 n. 18, talk of the “very essence of necessity” in terms of inference by an observer, but they are clearly referring to an *idealised* observer whose inferences are governed by knowledge of all the relevant regularities (see §7.1 on Hume’s rejection of subjectivism below). These 20 quotations are also in Millican (2024), §7.

4. Overview of Hume's Position

§1 and §2 above explain why Hume's two definitions of cause – at *Treatise* 1.3.14.31 and *Enquiry* 7.29 – have seemed so confusing, and also why a broader study of his texts can help to resolve this confusion by highlighting his dominant emphasis on the first definition over the second. This is not to deny that puzzles remain regarding Hume's intentions in his sections “Of the idea of necessary connexion” (and especially the two definitions), and how far he may be successful.⁵ But whatever that verdict might be, his later discussions (including many of the quotations from §3 above) show that when identifying causal relations, Hume overwhelmingly favours the first definition over the second, strongly indicating that he is a *regularity theorist* about causation.

The rest of these notes continue as follows:

- A brief review of the huge significance of causation within Hume's philosophy (§5).
- Twelve “key points” about Hume's theory of causation (§6), strongly supported by textual quotation which ought to make them relatively uncontroversial (except for some relatively speculative material in §6g).⁶
- A deeper discussion of the major philosophical options for interpretation of Hume on causation (§7).

5. The Significance of Causation in Hume's Philosophy

- The longest part of the entire *Treatise*, Book 1 Part 3, is mainly devoted to the understanding of causation and causal reasoning, together with the related theories of belief and probability.
- Hume argues (*T* 1.3.2.1-3) that only causation can ground an inference from observed to unobserved (i.e. an empirical, “probable” inference). And the subtitle of the *Treatise* declares its aim to be “to introduce the experimental [i.e. empirical] method of reasoning into moral subjects”.
- Not only is causation the principal theme of *Treatise* 1.3, but also, the bulk of the discussion is framed by Hume's declared intention to analyse the crucial idea:

“To BEGIN regularly, we must consider the idea of *causation*, and see from what origin it is deriv'd. 'Tis impossible to reason justly, without understanding perfectly the idea concerning which we reason; and 'tis impossible perfectly to understand any idea, without tracing it up to its origin, and examining that primary impression, from which it arises.” (*T* 1.3.2.4)

- This bears fruit at *T* 1.3.14.20-4, with *successful* identification of the “impression of necessary connexion”, which thus *vindicates* the corresponding idea. But on the way, Hume discusses the Causal Maxim (*T* 1.3.3),⁷ the nature and basis of causal inference (*T* 1.3.4-6), the definition, causes, and influence of belief (*T* 1.3.7-10), and varieties of probable judgement, both respectable (*T* 1.3.11-12) and otherwise (*T* 1.3.13).
- Hume rounds off Book 1 Part 3 with a brief but important section giving “Rules by which to judge of causes and effects” (*T* 1.3.15) and a discussion of “The reason of animals” (*T* 1.3.16), the latter corroborating his theory of human causal inference through its application to non-human animals.
- The discussions of materialism in *T* 1.4.5.29-33 and of “liberty and necessity” (i.e. free-will and determinism) in *T* 2.3.1-2 extend causal explanation into the realm of human action. Both of these build crucially on Hume's analysis of causation (e.g. *T* 1.3.14.33, 1.4.5.30).⁸
- All this leaves it extremely unlikely that Hume would be a “corrosive” sceptic about causation.

⁵ Millican (2004, §8.1, p. 134) suggests that Hume is trying – not entirely convincingly – *both* (a) to smooth the path from a descriptive associationist psychology (in particular, his account of customary inference) to prescriptive rules founded on the presumption of uniformity (notably the rules of *T* 1.3.15); *and* (b) to identify the “impression” that grounds the key idea of necessary connexion, with a view to delimiting what it can legitimately represent (as applied in the sections “Of liberty and necessity”). His main motive for (b) is to attack the supposed distinction between “physical” and “moral” causes, and to insist that the very same notion of causation that applies to the physical world also applies to human behaviour.

⁶ For detailed discussion of these twelve “key points”, see Millican (2021) §1, pp. 208-23.

⁷ The Causal Maxim was a core component of the Cosmological Argument for God's existence as proposed by John Locke and Samuel Clarke, and we have biographical evidence that Hume's early sceptical interest in religion was significantly focused on these philosophers (see Millican 2016, §II-III).

⁸ Hume also had an early interest in the Problem of Evil, and recognised that determinism would make God responsible for humanly caused evil – see *E* 8.36, and his “early memoranda” (Millican 2016, §II). For discussion of the relationship between the Causal Maxim, what Hume calls “the doctrine of necessity”, and determinism, see Millican (2010).

6. Twelve Key Points of Hume's Theory of Causation

a Whether *A* causes *B* is an objective matter of fact, and causes – whether superficial or hidden – can be discovered by systematic investigation

- “Since therefore ’tis possible for all objects to become causes or effects to each other, it may be proper to fix some general rules, by which we may know *when they really are so*.” (T 1.3.15.2, my emphasis)
- “philosophers, observing, that, almost in every part of nature, there is contained a vast variety of springs and principles, which are hid, by reason of their minuteness or remoteness, find, that it is at least possible the contrariety of events may not proceed from any contingency in the cause, but from the secret operation of contrary causes. This possibility is converted into certainty by farther observation; when they remark, that, upon an exact scrutiny, a contrariety of effects always betrays a contrariety of causes, and proceeds from their mutual opposition.” (E 8.13, copied from T 1.3.12.5)

b Causes are understood to be prior and contiguous to their effects

- “I find in the first place, that whatever objects are consider’d as causes or effects, are contiguous; and that nothing can operate in a time or place, which is ever so little remov’d from those of its existence.” (T 1.3.2.6 cf. T 1.3.15.3), but Hume expresses reservations in a footnote, and drops contiguity from the *Enquiry* (7.29).
- “The second relation I shall observe as essential to causes and effects, is ... that of priority of time in the cause before the effect.” (T 1.3.2.7, cf. T 1.3.15.4)

c The principal component of the concept of causation is *necessary connexion*, which is essential to it

- “Shall we then rest contented with these two relations of contiguity and succession, as affording a compleat idea of causation? By no means. An object may be contiguous and prior to another, without being consider’d as its cause. There is a NECESSARY CONNEXION to be taken into consideration; and that relation is of much greater importance, than any of the other two above-mention’d.” (T 1.3.2.11)
- “we have ... discover’d a new relation betwixt cause and effect, ... This relation is their CONSTANT CONJUNCTION. Contiguity and succession are not sufficient to make us pronounce any two objects to be cause and effect, unless we perceive, that these two relations are preserv’d in several instances. We may now see the advantage of quitting the direct survey of this relation, in order to discover the nature of that *necessary connexion*, which makes so essential a part of it.” (T 1.3.6.3)
- Hume continues to insist that necessity “makes an essential part” of causation itself (T 2.3.1.18, cf. E 8.25) and of the definitions of cause (T 2.3.2.4, E 8.27).

d Causal necessity is not the same as *absolute* or *metaphysical* necessity

- “with regard to propositions, that are prov’d by intuition or demonstration ..., Whatever is absurd is unintelligible; nor is it possible for the imagination to conceive any thing contrary to a demonstration. But ... in reasonings from causation, and concerning matters of fact, this absolute necessity cannot take place, and the imagination is free to conceive both sides of the question” (T 1.3.7.3)
- “... without consulting experience, ... Any thing may produce any thing. Creation, annihilation, motion, reason, volition; all these may arise from one another, or from any other object we can imagine.” (T 1.3.15.1)
- “to consider the matter *a priori*, any thing may produce any thing” (T 1.4.5.30, cf. 1.4.5.32)
- “The mind can always conceive any effect to follow from any cause, and indeed any event to follow upon another: whatever we conceive is possible, at least in a metaphysical sense ...” (A 11, cf. E 12.28-9)

e Hume is a convinced determinist, although his basis for this is unclear

- Hume describes – and implicitly endorses – the standard deterministic view about “the operations of external bodies” (T 2.3.1.3, cf. A 31, E 8.4), and then goes on to argue that exactly the same applies to “the actions of the mind” (T 2.3.1.5-15, E 8.7-20). (For detail on this and all the points below, see Millican 2010.)
- He denies genuine *chance* or *indifference* (e.g. T 1.3.12.1, 2.3.1.18; E 6.1, 8.25).
- His fourth “rule by which to judge of causes and effects” at T 1.3.15.6 says “The same cause always produces the same effect, and the same effect never arises but from the same cause.”

- Determinism also features in Hume's theological discussions, notably regarding the Problem of Evil (e.g. *E* 8.32 ff.) and the morality of suicide ("Of Suicide" paragraph 5, *Essays* 580).
- "I never asserted so absurd a Proposition as that any thing might arise without a Cause: I only maintain'd, that our Certainty of the Falshood of that Proposition proceeded neither from Intuition nor Demonstration; but from another Source." (*Letters of David Hume* (1932) i 186)
- "the philosopher and physician ... know, that a human body is a mighty complicated machine: That many secret powers lurk in it, which are altogether beyond our comprehension: That to us it must often appear very uncertain in its operations: And that therefore the irregular events, which outwardly discover themselves, can be no proof, that the laws of nature are not observed with the greatest regularity in its internal operations and government.

The philosopher, if he be consistent, must apply the same reasoning to the actions and volitions of intelligent agents. The most irregular and unexpected resolutions of men may frequently be accounted for by those, who know every particular circumstance of their character and situation. A person of an obliging disposition gives a peevish answer: But he has the toothake, or has not dined. ... Or even when an action, as sometimes happens, cannot be particularly accounted for, either by the person himself or by others; we know, in general, that the characters of men are, to a certain degree, inconstant and irregular. ... The internal principles and motives may operate in a uniform manner, notwithstanding these seeming irregularities; in the same manner as the winds, rain, clouds, and other variations of the weather are supposed to be governed by steady principles; though not easily discoverable by human sagacity and enquiry." (*E* 8.14-15)

f Necessary connexion is one of a family of "power" terms which Hume treats as virtually synonymous in this context

- "I begin with observing that the terms of *efficacy*, *agency*, *power*, *force*, *energy*, *necessity*, *connexion*, and *productive quality*, are all nearly synonymous; and therefore 'tis an absurdity to employ any of them in defining the rest. By this observation we reject at once all the vulgar definitions, which philosophers have given of power and efficacy; and instead of searching for the idea in these definitions, must look for it in the impressions, from which it is originally deriv'd. If it be a compound idea, it must arise from compound impressions. If simple, from simple impressions." (*T* 1.3.14.4, cf. *E* 7.3, 8.25 n. 19)

g Understanding these terms involves having a certain simple *idea*, which is copied from a corresponding *impression* of reflection

- *E* 7.8 n. 12 presumes that "the idea of power" is an "original, simple idea"; see also *T* 1.3.14.4 above. But this is puzzling, given that *necessary connexion* is clearly a *relation* (cf. *T* 1.3.2.6, 11), and relations seem inevitably *complex*, as Hume himself acknowledges (*T* 1.1.4.7). Likewise, *power* must be understood, he says, as *relative* to an effect (*E* 7.14, 7.29 n. 17), apparently implying complexity. A plausible solution (cf. Millican 2007b §2.2) is to interpret Hume as attempting to identify a simple *common element* in all of the various relational notions that he is investigating – we might call this *consequentiality*.
- Hume finds the crucial impression by shifting from *causal* to *inferential* consequentiality. This looks quite philosophically promising if he is implicitly appealing to a *Lockean* faculty of *reflection* (cf. Locke's *Essay* II i 4), which enables us to *monitor* our mental operations, and thus to become aware when an inference is taking place (rather than simply experiencing a succession of thoughts and feelings).
- Elsewhere, the *Treatise* suggests that "impressions of reflection" ("internal impressions") are confined to "passions, desires, and emotions" (*T* 1.1.2.1, cf. 1.1.1.1, 1.1.6.1, 1.2.3.3). The *Enquiry* sometimes seems more Lockean, talking of "reflection on the *operations* of our own minds" (*E* 7.9, cf. 7.25).
- This Lockean perspective could explain why Hume describes the impression as a "determination" of the mind or thought (*T* 1.3.14.20, 22, 29; 1.4.7.5), or a customary "transition of the imagination" (*E* 7.28, 30) – not so much a *feeling*, as *reflective awareness* of such inference taking place. It also fits well with his description of it as "that inference of the understanding, which is the only connexion, that we can have any comprehension of" (*E* 8.25), suggesting we are able to grasp it *as a movement of the mind from A to B*.
- This account could also explain how the *idea* copied from that impression – on this view, the idea of *consequentiality* – might plausibly be seen as essential to a correct understanding of causation, and attributable to external causes and effects, whereas attributing a mere subjective *feeling* would be incoherent.
- But unfortunately, in the *Enquiry* Hume repeatedly and explicitly emphasises through italicisation that he considers the impression in question to be something that we *feel*, at *E* 7.28 (twice), 7.29 and 7.30. And at *E* 7.29 n. 17, he strongly suggests that applying this "internal sensation" to "external bodies" is a *mistake*
- However we interpret the impression, *Hume clearly sees his quest as succeeding when that impression is identified* (*T* 1.3.14.20, 22; *E* 7.28, 30), thus *legitimizing* the idea through the Copy Principle (so his attitude to the idea of power or necessary connexion is quite different from his attitude to our thoughts of external objects or selves, which turn out to be *fictions* (*T* 1.4.2.29, 36, 42-3, and 52; *T* 1.4.6.6-7).

h That impression arises from observed *constant conjunction* and the consequent tendency to draw inductive inferences

- “Perhaps ’twill appear in the end, that the necessary connexion depends on the inference, instead of the inference’s depending on the necessary connexion” (*T* 1.3.6.3). This is best taken as referring to the *origin* of the idea of necessity, through instinctive customary inference from a present impression.
- But once we have explicitly ascribed a causal connexion between *A* and *B*, the order of explanation changes, and we can go on to make further inferences – often of great complexity – based on that ascription (so now the inference depends on the ascription). This is no longer instinctive: careful reflective reasoning is often needed to distinguish genuine causal relations from those that are merely superficial (e.g. *T* 1.3.13, 1.3.15).

i Hume accordingly provides two *definitions* of cause

- “We may define a cause to be [1] ‘An object precedent and contiguous to another, and where all the objects resembling the former are plac’d in like relations of precedency and contiguity to those objects, that resemble the latter.’ If this definition be esteem’d defective, because drawn from objects foreign to the cause, we may substitute this other definition in its place, viz. [2] ‘A cause is an object precedent and contiguous to another, and so united with it, that the idea of the one determines the mind to form the idea of the other, and the impression of the one to form a more lively idea of the other.’ (*T* 1.3.14.31)
- “Similar objects are always conjoined with similar. Of this we have experience. Suitably to this experience, therefore, we may define a cause to be [1] *an object, followed by another, and where all the objects, similar to the first, are followed by objects similar to the second.* ... The appearance of a cause always conveys the mind, by a customary transition, to the idea of the effect. Of this also we have experience. We may, therefore, suitably to this experience, form another definition of cause; and call it, [2] *an object followed by another, and whose appearance always conveys the thought to that other.*” (*E* 7.29)
- It seems unlikely that Hume intends these as analytical specifications of *necessary and sufficient conditions*. He knows that customary inference can occur in respect of conjunctions that are very far from constant (e.g. *T* 1.3.13.7), and that genuine constant conjunctions can lie undiscovered, so that “philosophers” who wish to identify them have to go to great trouble to do so (as at *T* 1.3.12.5 and *E* 8.13–15, as well as *T* 1.3.15, cf. §a and §e above). So the two definitions will often in practice come apart.
- Hume’s explicit aim here is to investigate *our understanding of the relation of cause and effect* in terms of *the conditions in which that idea arises, and the impression from which it is copied*. This is, accordingly, what the definitions aim to encapsulate, focusing on the crucial idea of power or necessary connexion.

j Hume also provides two definitions of necessity, which he applies to the issue of “liberty and necessity”

- The definitions of cause and of necessity are separately indexed in the volume of the *Essays and Treatises* that contains the *Enquiry*: “CAUSE and EFFECT ... Its Definition” refers to *E* 7.29 and 8.25 n. 19; “NECESSITY, its definition” refers to *E* 8.5 and 8.27 (see Hume 1748, pp. 229–30):
- “Our idea, therefore, of necessity and causation arises entirely from the uniformity, observable in the operations of nature; where similar objects are constantly conjoined together, and the mind is determined by custom to infer the one from the appearance of the other. These two circumstances form the whole of that necessity, which we ascribe to matter. Beyond [1] the constant *conjunction* of similar objects, and [2] the consequent *inference* from one to the other, we have no notion of any necessity, or connexion.” (*E* 8.5)
- “Necessity may be defined two ways, conformably to the two definitions of *cause*, of which it makes an essential part. It consists either [1] in the constant conjunction of like objects, or [2] in the inference of the understanding from one object to another.” (*E* 8.27; *T* 2.3.2.4 is very similar)
- “... Here then are two particulars, which we are to regard as essential to necessity, viz. [1] the constant *union* and [2] the *inference* of the mind; and wherever we discover these we must acknowledge a necessity.’ ... this reasoning puts the whole controversy in a new light, by giving a new definition of necessity. ... the ... advocates for free-will must allow this union and inference with regard to human actions. They will only deny, that this makes the whole of necessity. But then they must shew, that we have an idea of something else in the actions of matter; which, according to the foregoing reasoning, is impossible.” (*A* 32–4)
- Hence those such as Clarke who attempt to draw a distinction between *physical* necessity and *moral* necessity are refuted: they cannot even form a coherent idea of the “something else” that they wish to attribute to “the actions of matter” (see also the corollary of the two definitions at *T* 1.3.14.33). Hume’s emphatic use of this argument – consistently in all three works – conclusively refutes the “New Hume” interpretation which takes Hume himself to be denying that satisfaction of his two definitions “makes the whole of necessity”.

k When the two definitions come apart, *constant conjunction* dominates

- According to Hume, we should endeavour to discover the reliable causal conjunctions that underlie superficial inconsistencies (*T* 1.3.12.5, *E* 8.13-15), to identify high-level *general rules* that can overcome prejudices (*T* 1.3.13.11-12), and to apply the rules by which to judge of causes and effects (*T* 1.3.15) “to distinguish the accidental circumstances from the efficacious causes” (*T* 1.3.13.11).
- When we are unable to identify genuinely *constant* causal relationships, we should condition our expectations by the experienced frequencies (most explicitly at *E* 10.3-4, cf. *T* 1.3.11-12; *E* 6).
- In discussing whether “matter and motion” (*T* 1.4.5.29, 33) could possibly be the cause of thought, Hume concludes: “that all objects, which are found to be constantly conjoin’d, are upon that account only to be regarded as causes and effects. Now as all objects, which are not contrary, are susceptible of a constant conjunction, and as no real objects are contrary; it follows, that for ought we can determine by the mere ideas, any thing may be the cause or effect of any thing; which evidently gives the advantage to the materialists above their antagonists.” (*T* 1.4.5.32)
- Hume frequently emphasises the priority of the first definition by stating that “the very essence” of power, cause and effect, or necessity is constituted by “constant conjunction of objects” (*T* 1.4.5.33), “multiplicity of resembling instances” (*T* 1.3.14.16), “constancy” (*E* 8.25 n. 19) or “uniformity” (*T* 2.3.1.10). Sometimes he remarks that such consistent patterns would provide a perfectly informed observer with a reliable basis for inductive inference (*T* 2.3.2.2, *E* 8.22 n. 18), but even then it is the *potential* for such inference – and hence the uniformities themselves – that constitutes “the very essence” of causal necessity, not the *actual* occurrence of any inference based on them.
- There is a suggestive parallel with the two definitions of virtue or “personal merit” in the second *Enquiry* (in terms of [1] “mental qualities, useful or agreeable to the person himself or to others” at *M* 9.1 cf. 9.12; or [2] “whatever mental action or quality gives to a spectator the pleasing sentiment of approbation” at *M Appx* 1.10). In this case, too, Hume’s critical discussion of the “monkish virtues” at *M* 9.3 strongly suggests that the objective definition should dominate if the two come apart.

l In the first *Enquiry*, Hume recognises more sophisticated causal relations than in the *Treatise*, mediated by quantitative powers and forces

- In the *Treatise*, Hume seems to be thinking of causal relations as holding almost exclusively between discrete types of event: hence his talk of “constant conjunction”. Even the “rules by which to judge of causes and effects” talk of the absolute presence or absence of particular causal factors:

“4. The same cause always produces the same effect, and the same effect never arises but from the same cause. ...

5. ... where several different objects produce the same effect, it must be by means of some quality, which we discover to be common amongst them ...

6. ... The difference in the effects of two resembling objects must proceed from that particular, in which they differ. ...

8. ... an object, which exists for any time in its full perfection without any effect, is not the sole cause of that effect ...” (*T* 1.3.15.6-8, 10)
- Only the seventh rule gives any hint that we might be dealing with varying quantities, which cannot therefore be characterised in terms of discrete types of “object”:

“7. When any object encreases or diminishes with the encrease or diminution of its cause, ’tis to be regarded as a compounded effect, deriv’d from the union of the several different effects, which arise from the several different parts of the cause.” (*T* 1.3.15.9)
- But even this is very crude and unscientific, given that Newtonian physics treats the impact of billiard balls not in terms of “motion in the first ball” causing “motion in the second” (or even “parts of the cause” etc.), but rather, in terms of the relevant *velocities, masses, angles, coefficient of restitution, momentum*, and so forth – all of these being arithmetically quantifiable on a continuous scale.
- The *Enquiry* recognises this, e.g. conservation of momentum: “it is a law of motion, discovered by experience, that the moment or force of any body in motion is in the compound ratio or proportion of its solid contents and its velocity” (*E* 4.13). Going on to discuss induction, Hume refers back to “that wonderful force or power, which would carry on a moving body for ever in a continued change of place, and which bodies never lose but by communicating it to others” (*E* 4.16), talks of “secret powers” (*E* 4.16, 21), and couches his argument in terms of constant conjunction *between the “sensible qualities” and the “secret powers”* (rather than between “objects” as in the *Treatise*).

- Two footnotes in *Enquiry* 7 help to bring quantitative “powers” within the scope of Hume’s theory of causation, generalising beyond mere constant conjunction – and even beyond multi-factor interactions – to include arithmetical functional relationships. But Hume’s main point in them seems to be his insistence that our only grasp of such powers is relational, that we understand them in terms of their perceived effects:
- “We find by experience, that a body at rest or in motion continues for ever in its present state, till put from it by some new cause; and that a body impelled takes as much motion from the impelling body as it acquires itself. These are facts. When we call this a *vis inertiae*, we only mark these facts, without pretending to have any idea of the inert power; in the same manner as, when we talk of gravity, we mean certain effects, without comprehending that active power.” (E 7.25 n.16)
- “According to these explications and definitions, the idea of *power* is relative as much as that of cause; and both have a reference to an effect, or some other event constantly conjoined with the former. When we consider the *unknown* circumstance of an object, by which the degree or quantity of its effect is fixed and determined, we call that its power: And accordingly, it is allowed by all philosophers, that the effect is the measure of the power. But if they had any idea of power, as it is in itself, why could not they measure it in itself? The dispute whether the force of a body in motion be as its velocity, or the square of its velocity; this dispute, I say, needed not be decided by comparing its effects in equal or unequal times; but by a direct mensuration and comparison.” (E 7.29 n. 17)

7. Philosophical Interpretation of Hume’s Theory: Reductionist, Subjectivist, Projectivist, or Sceptical Realist?

All of the points established in §6 above fit easily with a traditional reductionist interpretation of Hume’s theory. Reductionism is clearly consistent with causal objectivity (a), and with the provision of definitions in terms of non-causal relations such as priority, contiguity and constant conjunction (b and i). It is also entirely consistent with treating *necessary connexion* as essential to causation, as long as this necessary connexion itself is also understood reductively, through parallel definitions (c and j), rather than – for example – being treated as some variety of *absolute* modality (d). Reductionism is also entirely consistent with determinism (e), as long as that doctrine is interpreted accordingly, in terms of universal conformity to regular laws (rather than any supposed metaphysical “straitjacket”). And of course reductionism is the most natural way of reading Hume’s discussion of the “idea of necessary connexion”, where he seeks the *meaning* of causal terms by tracing the relevant impression (f, g, h). The main objections to interpreting Hume as reductionist have come from the apparent conflict between his two definitions, and his apparent subjectivism. The former objection is implicitly countered by k and l, which show how the first definition (and the objective functional relationships that it involves) *dominate* the second definition (which is based on “intuitive” causal inference). The latter objection is dealt with in the following section, followed by a brief review of the other popular interpretative options.

7.1 Hume’s Rejection of Subjectivism in the *Enquiry*

The *Treatise* contains numerous passages that appear to assert the subjectivity of causal necessity, mostly in Section 1.3.14 (cf. T 1.4.7.5, 2.3.1.4 and 2.3.1.6). Here are four clear examples:

“Necessity, then, ... is nothing but an internal impression of the mind” (T 1.3.14.20); “necessity is something, that exists in the mind, not in objects” (T 1.3.14.22); “the necessity or power ... lies in the determination of the mind”. (T 1.3.14.23); “power and necessity ... are ... qualities of perceptions, not of objects” (T 1.3.14.24).

By contrast, the *Enquiry* only twice suggests that causal necessity is subjective:

“When we say, therefore, that one object is connected with another, we mean only, that they have acquired a connexion in our thought, and give rise to this inference ...” (E 7.28)

“The necessity of any action, whether of matter or of mind, is not, properly speaking, a quality in the agent, but in any thinking or intelligent being, who may consider the action; and it consists chiefly in the determination of his thoughts to infer the existence of that action from some preceding objects” (E 8.22 n. 18)

The latter it is a note, consisting of text copied from the *Treatise*, explaining why people mistakenly believe in “indifference”, and it ends by describing necessity in terms of *potential and idealised* (not actual) inference:

“a spectator can commonly infer our actions from our motives and character; and even where he cannot, he concludes in general, that he might, were he perfectly acquainted with every circumstance of our situation and temper, and the most secret springs of our ... disposition. Now this is the very essence of necessity, ...”

The placement of *E* 7.28 would give it far greater significance, except that its subjectivist implication is negated in the very next paragraph, after the two definitions have been presented:

“We say, for instance, that the vibration of this string is the cause of this particular sound. But what do we mean by that affirmation? We either mean, that this vibration is followed by this sound, and that all similar vibrations have been followed by similar sounds: Or, that this vibration is followed by this sound, and that upon the appearance of one, the mind ... forms immediately an idea of the other. We may consider the relation of cause and effect in either of these two lights; but beyond these, we have no idea of it.” (*E* 7.29)

It seems, therefore, that before the two definitions (e.g. at *E* 7.28), Hume is focusing on the subjective origin of our idea of necessary connexion, but that having presented them, he then allows that causal necessity can be understood *either* in terms of constant conjunction *or* in terms of customary inference.⁹

7.2 Hume’s Supposed “Projectivism” about Causation (and Morality)

The idea that Hume is a “projectivist” has most often been discussed with reference to these two passages:

“This contrary bias is easily accounted for. ’Tis a common observation, that the mind has a great propensity to spread itself on external objects, and to conjoin with them any internal impressions, which they occasion, ... [this is] why we suppose necessity and power to lie in the objects ..., not in our mind, ...” (*T* 1.3.14.25)

“Thus the distinct boundaries and offices of *reason* and of *taste* are easily ascertained. The former conveys the knowledge of truth and falsehood: The latter gives the sentiment of beauty and deformity, vice and virtue. The one discovers objects as they really stand in nature, without addition or diminution: The other has a productive faculty, and gilding or staining all natural objects with the colours, borrowed from internal sentiment, raises, in a manner, a new creation.” (*M App* 1.21)

In the first passage, Hume is *explaining away an erroneous objection to his theory of necessary connexion*, not endorsing such “projection”. The second passage seems approving of “projection” in the moral case, but notice that he is here *distinguishing* between the “boundaries and offices” of *reason* and *taste*, saying that *reason* “conveys the knowledge of truth and falsehood” and “discovers objects as they really stand in nature, without addition or diminution”,¹⁰ while *taste* gilds or stains. But crucially, Hume himself clearly considers causal judgements as lying within the domain of *reason*,¹¹ thus standardly representing objects *without addition or diminution*. The sentimental gilding that he associates with *taste*, and which distinguishes it from *reason*, appears to involve its action-guiding nature and its association with human desires (e.g. *EPM App* 1.18-20, cf. *T* 3.1.1.6). Thus Hume’s distinction between *reason* and *taste* here seems to come down to the familiar divide between the *cognitive* and the *conative*. And so far from “gilding or staining” being a unifying theme across Hume’s theories of causation and morality, its application to moral judgements is precisely what pushes them into the category of taste, thereby *distinguishing* them sharply from causal judgements.

Blackburn’s projectivism understands Hume’s impression and idea of necessary connexion *functionally*, in terms of our inferential behaviour and attitudes. This is philosophically attractive, as we saw in §6g above, because ascribing *consequentiality* between events seems coherent and fits well with what we are doing when we ascribe causal relations. But unfortunately, as we also saw, Hume – even in the *Enquiry* – continues to describe the impression as something we *feel*, suggesting that projection of this onto objects is a mistake.¹²

⁹ This seems relatively clear in the *Enquiry*, and might perhaps also be taken to provide a clue to the interpretation of the *Treatise*, for example on the supposition that Hume had a similar view there but failed to express it clearly, having overdramatised the subjectivism of his position for rhetorical effect.

¹⁰ *Reason* here is accordingly our *cognitive* faculty, “by which we discern Truth and Falshood” (1748, 1.4 n., cf. *P* 5.1), whether of relations of ideas or matters of fact (e.g. *T* 3.1.1.9; *M App* 1.6). For extensive discussion of this notion of reason, and its relation to “the imagination” within Hume’s thinking, see Millican (2012, §§3.2-3).

¹¹ *M App* 1.2-3 repeatedly emphasises that “*reason* instructs us in the several tendencies of actions”. See also *T* 2.3.3.3: “the causes and effects ... are pointed out to us by reason and experience”; *T* 3.1.1.12: “reason, in a strict and philosophical sense, ... discovers the connexion of causes and effects”.

¹² We can still find a genuine element of “projectivism” in Hume’s theory of causation, arising from his Copy Principle which obliges him to seek an “impression of reflection” to ground any idea that is not straightforwardly sensory. It is then almost inevitable, if his quest succeeds, that the “internal” impression he identifies can be construed as “projected” when represented through that idea. But then the link between Hume’s theories of causation, morals and aesthetics is revealed as relatively shallow, based on his overt empiricism, rather than any deep theory of projectivist objectification.

7.3 The New Hume

As argued above, Hume consistently treats constant conjunction (and elaborations thereof, as in §61 above) as the criterion of causal truth, and insists repeatedly that *we can have no conception whatever of causal necessity that goes beyond his two definitions*. Even more significantly, he presents important arguments – concerning materialism in *T* 1.4.5.29-33, and liberty and necessity in *T* 2.3.1-2, *A* 31-4 and *E* 8 – that depend crucially on this claim. The latter argument is especially emphatic in this respect:

- It is consistent in all three works: the *Treatise*, the *Abstract*, and (all the many editions of) the *Enquiry*.
- It includes explicit anticipations of the protests to be expected from those who take physical causation to involve some kind of necessity that is stronger than Hume's two definitions.
- Such opponents deny that satisfaction of the definitions "makes the whole of necessity" (*A* 34), "maintain there is something else in the operations of matter" (*T* 2.3.2.4), and thus "rashly suppose, that we have some farther idea of necessity and causation in the operations of external objects" (*E* 8.22). Hume's response is to insist that his analysis shows any such idea to be "impossible" (*A* 34), and hence that "there is no idea of any other necessity or connexion in the actions of body" (*E* 8.27. cf. *T* 2.3.2.4).
- He highlights the same point at the beginning of the *Enquiry* version of the argument: "Beyond the constant conjunction of similar objects, and the consequent inference from one to the other, we have no notion of any necessity, or connexion." (*E* 8.5). This occurs only six paragraphs after Hume's two definitions of cause (*E* 7.29), and is where he starts applying them to solve "the long disputed question concerning liberty and necessity" (*E* 8.2), "the most contentious question, of metaphysics, the most contentious science" (*E* 8.23).
- Nobody reading Sections 7 and 8 of the *Enquiry* together could reasonably be in any doubt that the definitions have been presented expressly with a view to this crucial application, for which it seems that they must serve the role of delimiting *what we can properly mean* by causal power and necessity.

The "New Hume" interpretation identifies Hume's own position as taking causation to involve something beyond his two definitions – exactly the position of his opponents in this argument! New Humean attempts to address this problem have been unsuccessful, as most Hume scholars agree.¹³ Unless and until there is a credible reply from the New Humean side, therefore, their position can reasonably be considered refuted: it is *not* plausible to interpret Hume as believing in a "thick" kind of causation outrunning his two definitions.¹⁴

Even if New Humean interpretations could somehow evade this apparently devastating objection, others would remain. One is the sheer difficulty of making appropriate sense of Hume's texts, including his main argument concerning "the idea of necessary connexion", his statements of what he takes that argument to achieve (e.g. *T* 1.3.2.4, 1.3.14.2; *E* 7.3-5), and the corollaries and other conclusions that he draws from his definitions (at *T* 1.3.14.32-6, and as explained above). Strawson, for example, ignores Hume's statements of purpose and instead devotes eight chapters (14 to 21) to going through the *Treatise* and *Enquiry* discussions giving his own gloss on a sequence of passages, apparently chosen because they contain alleged "Referring uses of Causation terms" (§14.2). Fitting his interpretation with the text, moreover, requires making the implausible claim that Hume is an objectivist about *power*, but subjectivist about causal *necessity*,¹⁵ despite Hume's explicitly and repeatedly stating that these are equivalent, treating them as such, and even alternating between them within the very argument that is advertised (*E* 7.3) as fixing their precise meaning.

¹³ For example, both Ott (2011) and Willis (2015, p. 205 n. 43) allude to a general view that "the New Hume debate has run its course" and been "ended ... once and for all" by the objection from liberty and necessity. Hakkarainen (2012), p. 307 n. 36 refers to the objection as "devastating", while Ainslie (2012) describes Winkler (1991) and Millican (2009) as "persuasive rebuttals" of the New Hume. My sense from discussion with other scholars confirms that this view is widespread.

¹⁴ For an initial presentation of the argument from "liberty and necessity" against the New Hume, see Millican (2007a, §VIII) and (2007b, pp. 244-5 and n. 74). Beebe (2007) and Kail (2007, pp. 262-7) proposed answers, which were briefly addressed in Millican (2009), while Wright (2009, pp. 183-6) suggested that *T* 2.3.2.4 must be disingenuous. The approaches of Beebe, Kail, and Wright were comprehensively criticised in Millican (2011), to which so far no reply has been offered. Strawson (2011, p. 63, n. 51), citing all four of these papers of mine, claims to have *refuted* the objection without even engaging with it, alluding to three sections of his book (§1.4, §2.4, and §2.7) in which the only reference to Hume's discussions of liberty and necessity involves selective quotation from *E* 8.21 (p. 25), omitting even the most crucial parts of that paragraph. His reissue of *The Secret Connexion* (2014) fails to mention either the objection, or any of the papers (by Winkler and myself) in which it was urged.

¹⁵ For Hume's "global subjectivism about necessity" see Strawson (1989, §15.3). Also note that in view of our earlier results, it is entirely straightforward to read Hume's "referring uses of causation terms" as sincerely referring to *objective* causal powers (and *objective* causal necessities), without interpreting him in the New way.

Another major objection to New Humean interpretations arises from their need to give content to the supposed “thick” notion of causal necessity without involving an impression-derived *idea*. Their standard recourse has been to interpret Hume as supposing a hidden *conceptual* necessity, such that if *A* causes *B*, then this means that *A* has some property which, if only we knew of it, would sanction the inference that *B* must follow with a priori certainty.¹⁶ But given Hume’s fondness for the Conceivability Principle, it seems implausible that he could even seriously contemplate such conceptual necessities between “distinct existences”, let alone believe in them. New Humeans have accordingly suggested that his commitment to the Conceivability Principle must be less than it seems, but they face an uphill battle given the weight of textual evidence against them, including of the order of thirty unqualified statements of the principle in the *Treatise*, *Abstract*, and *Enquiry*.¹⁷

7.4 Humean Objective Powers (if not, perhaps, powers in objects)

We are left, then, with the traditional interpretation of Hume as a *reductionist* about causation, and as this would imply (and is anyway strongly supported by §6a, §6e, §6k and §6l):

Hume does believe in real causes.

Since, moreover, he sees causation as essentially involving causal power or necessity (§6c above), it seems to follow that *on his own interpretation of the relevant terms*:

Hume also believes in real causal powers and real causal necessity.

This indeed becomes entirely unproblematic given Hume’s first definition of necessity (§6j), which implies that *causal necessity and power, like causation, can be understood reductively in terms of constant conjunction* (which also explains how necessity can be essential to causation, since *both* are understood in the same way).

So Hume does believe in *objective powers* in one sense: powers that are there in the objective world, and not observer-relative. But does he believe in *powers in objects*? This is a more tricky question, for reasons raised in §6l above. As we have seen, identifying the relevant causes, powers, and necessities in a situation will often require careful and painstaking investigation, including systematic observation, experimentation, and generalisation, in the attempt to devise laws – sometimes mathematically complex laws – capable of reducing the various phenomena to order. Some of these, such as the Newtonian laws, may involve quantitative factors (e.g. momentum and kinetic energy) that are naturally expressible in terms of “energy”, “force”, and “power”, and through which one can relatively straightforwardly correlate the factor with the effect (thus implying, in the language of *E* 7.29 n. 17, “that the effect is the measure of the power”). But there is no guarantee that this will always be the case: not all causal laws are so simple. Ironically, however, Hume’s apparently crude running-together of so many terms (as in §6f above) could help here, manifesting open-mindedness over the form that future theories might take. If the “power” language of the *Enquiry* is indeed intended to be thus open-minded, then it need not indicate any commitment to *powers in objects*, but only to *objective powers* in the sense above (i.e. powers that are real and not *mind-dependent*). Accordingly, when Hume talks of the “powers and forces” of objects, he can be understood as referring to the characteristics – typically unknown, and quite likely quantitative – of *both* individual objects *and* their situations, that determine their behaviour in accordance with the appropriate laws of nature. What then actually occurs will be a holistic result of the entire array of “powers and forces” operative in the situation, quite different from the simplistic “inference from one object to another” suggested by his talk of “constant conjunction”, and significantly more complicated than the scenarios envisaged in the *Enquiry* footnotes discussed in §6l above, where an object’s behaviour is straightforwardly dependent *on its own* “power”. How far Hume envisaged all this is unclear, but at any rate a consistent *Humean* position would probably be committed to *objective powers*, but not necessarily to *powers in objects*.

¹⁶ Strawson calls this the “AP property” (1989, p. 111), and Kail the “reference-fixer for power” (2007, p. 256).

¹⁷ See Millican (2007b, pp. 234–6) and (2009, §6), which observe that both Kail (2003, p. 49) and Wright (1983, p. 103) confuse the Conceivability Principle with its converse (that *inconceivability* implies *impossibility*). Hume sets limits on the latter, but never on the former (and see Millican 2017 for much more on Hume’s logic). Despite his fondness for the AP property, Strawson does not recognise or address this problem at all.

References

- Ainslie, Donald C. (2012), Review of Galen Strawson, *The Evident Connexion*, in *Notre Dame Philosophical Reviews*, at <https://ndpr.nd.edu/news/the-evident-connexion-hume-on-personal-identity/>.
- Beebe, Helen (2007), “The Two Definitions and the Doctrine of Necessity”, *Proceedings of the Aristotelian Society* 107, pp. 413-31.
- Hakkarainen, Jani (2012), “Hume’s Scepticism and Realism”, *British Journal for the History of Philosophy* 20, pp. 283-309.
- Hume, David (1739-40), *A Treatise of Human Nature: A Critical Edition*, vol. 1, ed. David Fate Norton and Mary J. Norton, Oxford: Clarendon Press, 2007 (references indicated by “T”).
- Hume, David (1740), *An Abstract of ... A Treatise of Human Nature*, included in both Hume (1739/40) and Hume (1748); references indicated by “A” and given to paragraph number.
- Hume, David (1741-83), *Essays, Moral, Political, and Literary*, ed. Eugene F. Miller, Liberty Classics, 2nd edition 1987 – references indicated by “Essays”, and given to page number
- Hume, David (1748), *An Enquiry concerning Human Understanding*, ed. Peter Millican, Oxford: Oxford University Press, 2007 (references indicated by “E”).
- Hume, David (1751), *An Enquiry concerning the Principles of Morals*, ed. Tom L. Beauchamp, Oxford: Oxford University Press, 1998 (references indicated by “M”).
- Hume, David (1757/72), *A Dissertation on the Passions and The Natural History of Religion: A Critical Edition*, ed. Tom L. Beauchamp, Clarendon Press, 2007 (references to Dissertation indicated by “P”, and given to section and paragraph number).
- Hume, David (1932), *The Letters of David Hume*, ed. J. Y. T. Greig, 2 vols, Oxford: Clarendon Press.
- Kail, P. J. E. (2003), “Conceivability and Modality: A Lemma in an Argument in Defense of Skeptical Realism”, *Hume Studies* 29, pp. 43-61.
- Kail, P. J. E. (2007), “How to understand Hume’s realism”, in Read and Richman (2007), pp. 253-69.
- Locke, John (1690), *An Essay Concerning Human Understanding*, ed. P. H. Nidditch, Oxford: Clarendon Press, 1975 (“Essay”).
- Millican, Peter (2007a), “Humes Old and New: Four Fashionable Falsehoods, and One Unfashionable Truth”, *Proceedings of the Aristotelian Society, Supplementary Volume* 81, pp. 163-99.
- Millican, Peter (2007b), “Against the ‘New Hume’”, in Read and Richman (2007), pp. 211-52.
- Millican, Peter (2009), “Hume, Causal Realism, and Causal Science”, *Mind* 118, pp. 647-712.
- Millican, Peter (2010), “Hume’s Determinism”, *Canadian Journal of Philosophy* 40, pp. 611-42.
- Millican, Peter (2011), “Hume, Causal Realism, and Free Will”, in Keith Allen and Tom Stoneham (eds), *Causation and Modern Philosophy* (New York: Routledge), pp. 123-65.
- Millican, Peter (2012), “Hume’s ‘Scepticism’ about Induction”, in Alan Bailey and Dan O’Brien (eds), *The Continuum Companion to Hume* (London: Continuum), pp. 57-103.
- Millican, Peter (2016), “Hume’s Chief Argument”, in Paul Russell (ed.), *The Oxford Handbook of Hume* (Oxford: Oxford University Press), pp. 82-108.
- Millican, Peter (2017), “Hume’s Fork, and His Theory of Relations”, *Philosophy and Phenomenological Research* 95, pp. 3-65.
- Millican, Peter (2021), “Hume on Causation and Causal Powers”, in Benjamin Hill, Henrik Lagerlund, and Stathis Psillos (eds), *Reconsidering Causal Powers: Historical and Conceptual Perspectives* (Oxford: Oxford University Press), pp. 206-40.
- Millican, Peter (2024), “Hume as Regularity Theorist – After All! Completing a Counter-Revolution”, *Hume Studies* 49, pp. 101-62.
- Ott, Walter (2011), Review of Keith Allen and Tom Stoneham (eds), *Causation and Modern Philosophy*, in *Notre Dame Philosophical Reviews*, at <http://ndpr.nd.edu/news/causation-and-modern-philosophy/>.
- Read, Rupert and Richman, Kenneth A., eds (2007): *The New Hume Debate: Revised Edition*, London: Routledge (first edition was 2000).
- Strawson, Galen (1989, 2014), *The Secret Connexion: Causation, Realism, and David Hume*, Oxford: Clarendon Press; second edition issued in 2014.
- Strawson, Galen (2011), *The Evident Connexion: Hume on Personal Identity*, Oxford: Oxford University Press.
- Willis, Andre (2015), *Toward a Humean True Religion*, Pennsylvania: Pennsylvania State University Press.
- Winkler, Kenneth P. (1991), “The New Hume”, in Read and Richman (2007), pp. 52-74. Originally published in *Philosophical Review*, 100, pp. 541-79.
- Wright, John P. (1983), *The Sceptical Realism of David Hume*, Manchester: Manchester University Press.
- Wright, John P. (2009), *Hume’s “A Treatise of Human Nature”*, Cambridge: Cambridge University Press.