

### 3

## Causal Laws and Causal Instances

HUME'S AIMS, strategies, and conclusions were examined in the first two chapters. In this chapter we turn to an exposition, analysis, and defense of major implications of his views. In particular we consider the relation between singular statements about particular causal relations and universal statements about general causal relations.

Hume's theory represents a profound and in some ways permanent shift in the history of philosophy, in which causal laws replaced causal instances as the real locus of controversy about the causal relation. Hume's predecessors had supposed that the causal relation was to be analyzed in terms of a particular item's inherent power, efficacy, or agency—or perhaps in the transmission of some quantity like energy, which an inherent power made possible. They also believed that causal laws are derived and established through the repeated experience of particular sequences of phenomena independently recognized as causal in character. We have already seen that Hume's own brand of Copernican revolution reverses this picture: individual cases of causation are to be analyzed in terms of constant conjunctions, while the powers we accord to them are assimilated to the terms of a mental association.

Hume's Copernican shift obliges him to provide first an account of the nature of these laws, second a justification for the claim that the truth of singular causal statements depends on the truth of law statements (instead of the reverse), and third an

explanation of why we sometimes correctly make singular causal claims without knowing the allegedly relevant laws and sometimes in the absence of previous acquaintance with the items of the sort causally related. We intend to discharge these and others of Hume's obligations in our analysis of his treatment of the relation of law and instance.

### I

Hume's denial of the primacy of individual causal sequences in understanding causal relations is not so much a consequence of his regularity theory as its starting point. His denial that we can learn what causation consists in by attending to particular sequences hinges on the claim that nothing is observable in these cases to distinguish them from accidental sequences. That is, we experience no quality or relation common and peculiar to individual sequences deemed causal, and we therefore cannot determine what causes and effects there might or must be by the minutest inspection of a particular event, state, or condition (T, 75). Specifically, the power, efficacy, or agency other philosophers accord to causes to explain the occurrence of their effects, is something we are incapable of detecting. As Hume puts it, "there is nothing in any object, considered in itself, which can afford us a reason for drawing a conclusion beyond it" (T, 139).

The empiricist strictures of Hume's ideas and impressions doctrine nudges him from this purely negative claim to his positive regularity theory of causality. It is sometimes contended that Hume's march can be stopped well short of his regularity account if only we refuse to grant his negative, empiricist claim that causality cannot be detected in the individual case. Gertrude Anscombe so argues:

[A]s to the statement that we can never observe causality in the individual case. Someone who says this is just not going to count anything as "observation of causality." This often happens in philosophy; it is argued that "all we find" is such-and-such, and it turns out the arguer has excluded from his idea of "finding" the sort of thing he says we don't "find." And when we consider what we are allowed to say we do "find," we have the right to turn the tables on Hume, and say that neither do we perceive bodies, such as billiard balls, approaching one another. When we "consider the matter with the

utmost attention" we find only an impression of travel made by successive positions of a round white patch in our visual fields . . . etc.<sup>1</sup>

Anscombe's aim is to argue for the primacy of individual causal sequences. Her strategy is to attack Hume's epistemology, hoping that its inadequacies will cast a pall over his theory of causation. Anscombe is quite wrong to suggest, however, that from the fact that we do perceive physical objects, *pace* Hume's theory of perception, the conclusion can be reached that we also perceive "a lot of causality." Quite apart from interpretative issues regarding whether Hume doubts that we perceive physical objects, it is clear that Hume does not deny that we observe cases of causal sequence and identify them on the basis of current and past observation. There is of course also a sense in which causality is not observable, and Anscombe herself admits that in this sense Hume was correct, though she does so in terms calculated to show Hume mistaken. Hume's standard challenge to his opponents was, "produce some instance, wherein the efficacy is plainly discoverable to the mind, and its operations obvious to our consciousness or sensation" (T, 157-58). Anscombe accepts the challenge:

Nothing is easier: is cutting, is drinking, is purring not "efficacy"? But it is true that the apparent perception of such things may be only apparent: we may be deceived by false appearances. Hume presumably wants us to "produce an instance" in which *efficacy* is related to sensation as *red* is. It is true that we can't do that; it is not so related to sensation. He is also helped, in making his argument that we don't perceive "efficacy," by his curious belief that "efficacy" means much the same thing as "necessary connection"<sup>2</sup>

For the purposes of Hume's argument that particular causal sequences cannot directly and immediately be recognized, all that is required is the admission that "efficacy," or power or agency, or productive force, or any of the cognates of causation, is not related to sensation in the way "red" is, whatever way that may be. That these former terms are not so related to sensation is indeed a consequence of Hume's epistemology and

1. Gertrude Anscombe, "Causality and Determination," as reprinted in Ernest Sosa, ed. *Causation and Conditionals* (Oxford: Oxford University Press, 1975), pp. 68-69.  
2. *Ibid.*, p. 69.

theory of perception. It is, however, also a consequence of a large number of other such theories, including some specifically mentioned and rejected by Hume himself. In any event, so far as Hume's "curious belief" is concerned, the notion that efficacy provides the necessary connection Hume's opponents hoped to find is a tentative *concession* Hume makes to his opponents in order to increase the plausibility of their argument; it is not a gratuitous assumption he himself embraces.

The passage quoted above is found in that section of the *Treatise* in which Hume examines all possible senses of necessary connection, and all possible attributions to causal sequences that might perform the functions accorded to necessary connection. Anscombe's attack represents a common mistake among Hume's critics, who suppose that defects in one of his theories must vitiate the central and distinctive features of other parts of his philosophy. It may be true that Hume's epistemological views and his theory of meaning first led him to a regularity account of causation, but the latter account may be assessed independently of his theories of knowledge and language. Indeed, his own arguments may consistently be expounded outside those contexts. (Moreover, any alternative to Hume's regularity approach ideally should explain why there is no directly or indirectly detectable property common and peculiar to causal sequences. Anscombe's view does not count as such an alternative, because her view is that the notion of causation is altogether unanalyzable. Her view can only be refuted by producing a successful and complete alternative analysis.)

Because Hume thinks no third thing is ever to be observed besides the two conjoined events called cause and effect, he is led to the view that there is a connection of meaning between the truth of a singular causal statement and the truth of one or more statements reflecting the regularity observed. A semantical entailment between singular causal statements and lawlike statements is required by both of Hume's two definitions. These two definitions reflect Hume's commitment to the primacy of laws over individual cases in the analysis of causation, for to regard an individual sequence as causal is *ipso facto* to regard it as an instance of a general law; to confirm that a sequence is causal is tantamount to confirming that a general statement is a law. The universality Hume thus finds within the particularity of in-

dividual causal sequences replaces the necessity conceived earlier in the history of philosophy as that which is most central to the concept of cause. But what exactly is the relationship between the singular statement and the law whose truth is a semantically necessary condition for the singular statement's truth? This putative relation must be squared with the evident fact that all—Humeans included—are willing to offer singular causal statements as true without knowing the laws that are allegedly their necessary conditions.

## II

We must first discuss the Humean notion of a causal law. Unfortunately, Hume never explicitly states the conditions a statement must meet to qualify as a causal law; moreover, he leaves even darker what kind of entity qualifies as a causal instance. In this section we reconstruct Hume's tacit commitments on both scores. First, however, we discuss the meanings of the definite label "law of nature," which Hume uses only rarely and then without careful attention to its meaning.

In scientific discourse "law of nature" covers less territory than in common discourse, for in the latter it may be applied to causal uniformities only crudely formulated and understood. Science, of course, recognizes some noncausal laws, but when words such as "law" and "lawlike generalization" or "nomological generalization" (to distinguish laws from other universal statements) are used in this chapter, they should be understood as including only the class of *causal* laws and generalizations. This class we take to have extensive membership and not to be coincident with the class of *scientific* laws. Any universal causal generalization qualifies if it is true and either is inferred from its instances or is deducible from another generalization or is derived analogically from other laws (cf. EHU, Sec. 26). Statements such as "Open flames cause dry newspaper to burn" are law statements in our stipulative, restricted sense of the term. (Cf. Hume's use of the terms "law" and "general fact"; EHU, Secs. 90, 132, 47.) Causal laws in this sense need not contain the verb "cause" or its cognates. The laws could be stated, for example, in the language of contiguity and succession or expressed in verbs and other parts of speech that reflect causal con-

nections. Thus "Open flames burn dry newspapers" is as much a causal law as the previous expression employing the word "cause." But, however formulated, every expression of a causal law is governed by a set of definitive specifications, a set we shall now examine in detail. To a large extent these specifications constitute the stock in trade of contemporary discussions of causal law. Nevertheless, it will be useful to collect them all here, and to find their warrant in the Humean corpus.

In the first place, Hume's emphasis on *constant* conjunction makes it patent that an irregularity of conjunction among particular sequences is impossible. Accordingly, a first specification for any causal law, *c*, is the *Uniformity Specification*:

- (1) *c* states a uniform relation of contiguity and succession between relevantly similar pairs of particular entities  $(x_1, y_1)$ ,  $(x_2, y_2) \dots (x_n, y_n)$ .

This specification is obviously insufficient, since Hume demands that *all* genuine instances of the type X be so related to an instance of type Y. Whenever and wherever a genuine antecedent condition X appears, a consequent condition Y follows (though *y*'s may conceivably occur without *x*'s). A second specification, then, is the *Universality Specification*:

- (2) *c* is universally quantified and has the form of a universal conditional.

According to Hume's first definition of causation (Df<sub>1</sub>), after which these first two specifications are patterned, it is a conceptual truth that causal laws are exceptionless. Statements describing regularities that "generally" or "frequently" hold do not qualify as laws. Nomological generalizations always have the general form "X is succeeded without fail by Y." But this formula is still too simple. Hume is committed to the formula "Same cause *x*, same effect *y*" *provided that* the causally relevant conditions surrounding *x* and *y* are also the same. A fuller analysis of this theory of causal laws, then, would read as follows: "Whenever an instance of *x* and causal conditions *o* coexist, an instance of *y* follows contiguously." Hume would undoubtedly insist that any full formulation of a causal law would include the complete set of jointly sufficient conditions, and many criticisms of Hume seem plausible only because they miss this important point.



Causal laws must also take the form of universal conditionals. Laws are often thought to be appropriately expressed, at least to a first approximation, in the universal conditional form "All A's are B's," where "A" and "B" are schematic letters for descriptive predicates. Construed as  $(x)(A_x \supset B_x)$  this form may seem satisfactory. There are, however, several reasons why a Humean might object to it, unless further specifications are mentioned. First, causal laws express a strong universal relation of succession that is masked by the atemporal and purely material conditional "All A's are B's." Second, accidental regularities share an identical logical form. Third, the descriptive terms themselves might involve dispositional concepts or causal relations that simply shift the analysis to a different level. Accordingly, it is better to begin with the looser form "Whenever condition A obtains, then condition B obtains," where it is understood that causal predicates cannot be substituted for "A" and "B," and that these descriptive predicates are logically independent. Even though modern logic recognizes no difference between "all" and "whenever," the latter more closely reflects Hume's specifications. Moreover, since Hume regards cause and effect as perfectly distinct and separable events, symbolization of causal generalizations might well recognize this logical difference by means of two quantifiers. The following is therefore an initially attractive rendering of  $c$ :

$$(x) [A_x \supset (\exists y) (B_y \cdot S_{yx})]$$

This formula expresses the structure of a statement to the effect that whenever there exists an instance of A, it is succeeded by an instance of B. The variable "x" ranges over causes described by predicate "A," and the variable "y" ranges over effects described by predicate "B." ("S" symbolizes the relation of contiguous succession. "A"—which here includes both X and O as distinguished above—and "B" are usually highly complex predicates.) This first-order symbolization for  $c$  still reflects a presumption that the causal force of a law is at least in part expressible by means of a truth-functional conditional such as material implication; yet it is now generally conceded that the material conditional is not an appropriate logical connective to express causal sufficiency.<sup>3</sup>

Temporarily laying aside problems of logical form, our analy-

3. See, e.g., Davidson's work cited in footnote 11 below.

sis of laws as universal conditionals is still incomplete, for such statements could describe accidental conjunctions (sharing the same logical form), and they could be false. The problem of accidental sequence is not dispelled by the Universality and Uniformity Specifications—a major problem confronted throughout Chapter 4. False statements must, of course, be excluded; and since the Universality Specification covers all cases, there must at no time be a falsifying instance. A third specification, then, is

(3)  $c$  is omnitemporally true.

This condition requires elaboration. The omnitemporality qualification is redundant: all nonindexical expressions that have truth-value have it omnitemporally, and causal laws cannot satisfy the universality and uniformity conditions if ineliminably indexical terms figure in their expression. The qualification is included here to emphasize the requirement that laws be totally exceptionless. It must also be borne in mind that (3) is not an epistemic requirement. (3) does not require  $c$  be known to be true, or even that it be believed true. Indeed, (3) does not describe *any* conditions for the acceptance of  $c$  as lawlike. (These epistemic issues will be treated in Chapter 4.)

Finally, a universal causal conditional describes a constant conjunction of instances that fulfill, as a matter of contingent fact, the succession expressed by the statement. *De facto* universality is integral to Hume's attack on rationalism and provides a fourth specification:

(4)  $c$  is contingent.<sup>4</sup>

This specification requires that statements of causal connection not be logically necessary. Although the nature of causal laws is such that, by definition, they are exceptionless, any particular causal generalization can be denied without self-contradiction. As shown in the previous chapter, it is a fundamental point in

4. In accordance with this specification, the truth-functional formulas mentioned under specification number 2 would have to be amended to show that a cause and an effect are not members of the same class. This is not to deny that there are analytically true general causal statements such as "Fatal illnesses cause death" or perhaps "Vacuum bottles cause liquids to remain warm." Whether these statements are nomological generalizations and related questions are discussed in later chapters.



Hume's philosophy that causal connections cannot be discovered by "reasonings *a priori*," since knowledge of such relations "arises entirely from experience" of constant conjunctions, or comes analogically or by education. Causal generalizations, then, are contingent in the sense that their truth or falsity depends on (is contingent on) empirical truth conditions (EHU, Secs. 21-23).

Although Hume never broaches the subject, his use of terms such as "always" and "constantly" strongly suggests that he would agree with those modern philosophers who insist that law statements in the present tense are statements of *unrestricted* universality.<sup>5</sup> This additional specification is essential for related reasons. First, causal laws are not mere substitutes for lists of proper names. They state that there has never been, is not, and never will be an exception to the regularities they express. This is true even if the classes mentioned in the law no longer have members—e.g., "All mastodons are tooth-bearing." Accordingly, all laws are formulable in the present tense and refer to open or infinite classes of instances rather than to closed or finite classes. (Laws that refer exclusively to past instances describe classes believed to be contingently closed to further augmentation.) Second, in asserting a law statement, we seem at least implicitly to be saying either that no finite number of observed instances composes the exhaustive class of the law's instances or that it cannot be known that an enumerated set is exhaustive. Laws stated in the present tense, then, are contingent, unrestricted universal statements of uniform succession believed to be true on the basis of some observed instances.

### III

Two problems confronting the above specifications deserve immediate attention: the problem of plural causes and the problem of ultimate causes.

*Plural Causes.* There may be a looseness in the Uniformity Specification due to Hume's neglect of the problem of a plurality of causes. He holds that "the same effect never arises but from

5. Cf. K. Popper, "A Note on Natural Laws and So-called Contrary-to-Fact Conditionals," *Mind* (January, 1949). Reprinted in *Philosophical Problems of Causation*, ed. T. Beauchamp (Encino, Calif.: Dickenson Publishing Co., 1974).

the same cause" (T, 173). This declaration, forming part of Hume's Fourth Rule "by which to judge of causes," is never given argued support. He does not carefully consider whether some difficulty may be generated by holding the counterclaim that there can be two causal generalizations, "Whenever X, then Y" and "Whenever Z, then Y," where X and Z are both logically separate and individually sufficient conditions of Y, and where Y is fully described in each case. He merely suggests, in his Fifth Rule, that "where several different objects produce the same effect, it must be by means of some quality, which we discover to be common amongst them" (T, 174). This claim that in certain cases there are not (or, more difficult still for Hume, could not be) a plurality of causes has struck some philosophers, both friendly and antagonistic, as implausible.<sup>6</sup> C. J. Ducasse's reaction is typical:

"Where several different objects produce the same effect," what immediately and obviously does follow is that *as a bare matter of experience nature is then not uniform*. . . . [What does not follow is] that these different objects have some common quality, as Hume asserts.<sup>7</sup>

Hume's Single Agreement criterion may be poorly formulated, but Ducasse and others have missed his point. The point is that to assume the general principle "same cause, same effect," is to assume that there is a "common quality" among "plural causes" (T, 173). Whether it is appropriate to make this assumption is a matter for experimentation to decide, not theory. An example of an unresolved problem may help illustrate our meaning. Suppose three different drugs produce apparently identical types of hallucination, and it is not known why. Despite our condition of partial ignorance, we are inclined to say that the effect in each instance is the same. This case is not significantly different from a situation in which apparently identical states of drunkenness are produced by mescal, brandy, and vodka. While mescal is distilled from the juice of the American aloe, brandy from the grape, and vodka chiefly from rye, we know that there is a

6. Cf. J. L. Mackie, "Causes and Conditions," *American Philosophical Quarterly* 2 (October, 1965), pp. 245-64, and A. Pap, *An Introduction to the Philosophy of Science* (New York: Free Press, 1962), pp. 255-58.

7. C. J. Ducasse, *Causation and the Types of Necessity* (Seattle: University of Washington Press, 1924; New York: Dover, 1969), p. 15.

distillate "common quality," relevant to all three causes, that produces the single effect. Hume is arguing the simple, and we think correct, point that our past successes in isolating such common qualities among apparently different causal sources leads us to predict that we can be similarly successful in handling such new plurality cases as those involving drugs.

Hume is here thinking of inductive reasoning by analogy. Much the same account is still widely prevalent in ongoing work in inductive logic and the theory of lawlikeness. Far from making the substantive point (which would be synthetic *a priori*) that there cannot be cases of plural causes, Hume is making the common sense methodological point that experience teaches us to look for common qualities and not to rest content with such a simple view of experience as that advanced by Ducasse. At best, Ducasse's argument leads to a stalemate, and at worst it makes him appear to be an opponent of inductive reasoning, which in fact he is not. As Juhani Pietarinen has perceptively pointed out,

Inference by analogy is closely connected with the problem of lawlikeness. A prerequisite for a growth of the degree of belief in a generalization is that certain (usually a great number of) properties are believed to a large extent to be irrelevant. But the analogical reasoning is not all that counts. The degree of learning depends essentially on certain assumptions about the "regularity" of the phenomena which the generalizations are concerned with.<sup>8</sup>

Since Hume's regularity theory of causation is neither crucially impaired by removal of his Fourth Rule nor significantly enhanced by its retention, there is no need to assess its shortcomings in detail. It should not be overlooked, however, that Hume intends his "Rules by which to judge of causes and effects" more as guiding principles to the discovery and verification of causal relations and claims than as firm theoretical principles that are either true or false. Their own warrant is inductive—the successes of their past employment. Hume would probably not contest the view that most of these rules, if in any sense true, are contingently and not analytically so (though at least some are conceptual truths, if his definitions of "cause" are presupposed). But he would challenge a defender of the plurality thesis to produce an example that is more than speculative. Short

8. Juhani Pietarinen, *Lawlikeness, Analogy, and Inductive Logic* (Amsterdam: North Holland Publishing Co., 1972), pp. 10–11.

of such an example, his Rules seem at least to be trustworthy; and it deserves notice that those who use the objection from causal pluralism provide no alternative explanation to account for the alleged fact of pluralism.

*Ultimate Causes.* Hume's discussions of ultimate causes also present a problem. He argues that one of reason's chief functions is to grasp "general causes" which explain "many particular effects." He pursues his point with the following argument:

As to the causes of these general causes, we should in vain attempt their discovery; nor shall we ever be able to satisfy ourselves, by any particular explication of them. These ultimate springs and principles are totally shut up from human curiosity and enquiry. Elasticity, gravity, cohesion of parts, communication of motion by impulse; these are probably the ultimate causes and principles which we shall ever discover in nature; and we may esteem ourselves sufficiently happy, if, by accurate enquiry and reasoning, we can trace up the particular phenomena to, or near to, these general principles. The most perfect philosophy of the natural kind only staves off our ignorance a little longer. (EHU, Sec. 26)

If this passage is interpreted in accordance with Hume's own theory of causation, a search for causes of general causes would indeed be "in vain." One might search for underlying and general regularities, which explain a wide variety of phenomena; but it would be a category mistake to seek the causes of general causes. Hume has been accused of committing this mistake by John Passmore:

Take the case where *A* always goes with *B*. How, on this definition of "cause" [Df<sub>1</sub>], can Hume intelligibly speak of such universal contingencies as having a cause? Just because the contiguity of *A* and *B* is universal, there is nothing prior to it. . . . It is meaningless to talk, as Hume does, of "the cause of attraction" (T, 13). In his sense of the word "caused," it is unintelligible to speak of attraction as "caused"; it could have a cause only if at one time bodies did not attract one another—in which case the laws of attraction would no longer be universal.<sup>9</sup>

9. J. A. Passmore, *Hume's Intentions* (Cambridge, England: Cambridge University Press, 1952), p. 30. Passmore is referring to *mental* attraction between ideas. (In addition to T, 13, cf. T, 92f, 169, 179, and EHU, Secs. 9, 26, 36.) For a much more favorable interpretation than Passmore's, see Donald Livingston, "Hume on Ultimate Causation," *American Philosophical Quarterly* 8 (1971), esp. pp. 66f.

This criticism betrays a misunderstanding of Hume's argument and its aim. Just prior to the above quotation from the *Enquiry*, Hume speaks of ultimate causes as powers and attacks the Lockean position that if the ultimate atomic constituents of things were exposed, their operations could fully be understood (by some rationalist standard of intelligibility). Hume contends that even following discoveries of the most general regularities, such as Newton's Law of Universal Gravitation or his own "universal laws of cohesion among ideas," we still find ourselves unable fully to understand phenomena that are subsumable under those laws or to "penetrate into the reason of the conjunction" (T, 12f, 169; EHU, Sec. 26). Such discoveries fail to explain what causes one event to succeed another, in Locke's sense of cause. Only succession is observed, never what makes the succession happen. In place of the false hope extended by Locke, Hume is offering his readers no more than a nonparadoxical, deductive-nomological account of explanation—viz., that deductive explanations, in those cases where the explanandum consists in a general law, subsume the explanandum under other laws of wider scope. This is what Hume means when he says "we must endeavour to render all our principles as universal as possible, by tracing up our experiments to the utmost, and explaining all effects from the simplest and fewest causes . . ." (T, xvii).

Hume's point is that repeatedly subsuming natural phenomena under causal laws of broader scope provides no comprehension of Lockean ultimate causes, for even the most basic laws only "stave off our ignorance" until discovery of their "general causes," i.e., general regularities from which they are deducible. The small thread of truth in Passmore's criticism is that Hume uses the term "general cause" sloppily, perhaps because he has Locke in mind. To render his language consistent Hume should say "general law" instead of "general cause." However, he does not fall into the deeper confusion Passmore attributes to him. He never commits himself to the view that general causes have prior and contiguous causes; he holds only that general regularity expressed by a nomological generalization may itself be grounded in other, "more ultimate" regularities. The problem of ultimate causes thus turns out to be identical to the problem of fundamental laws.

## IV

Bearing in mind the four specifications of general laws developed in Section II, we shall now consider the relation between laws that meet these specifications and singular causal statements. The obvious problem is that the causal generalizations that follow directly from reflection on common singular causal statements cannot always meet the requirements of Hume's theory. For example, the singular causal statement "the shelving of a copy of Hegel's *Phenomenology* caused the bookshelf to break" does not entail a general law to the effect that bookshelves break whenever copies of Hegel's *Phenomenology* are placed on them. The former statement might be true in virtue of the presence of a copy of that great classic being contingently necessary for the breaking, while the latter lawlike statement is not true. A predicate such as "shelving copies of Hegel's *Phenomenology*" might be among the antecedents of some lawful conditional, but it does not describe any part of the antecedent of the law that subsumes the particular causal sequence here described. After all, any other book or object of equal or greater weight would have been sufficient on the occasion for the breakage, though none would have been necessary. The causally relevant factor for purposes of generalization is weight, yet it goes unmentioned in the true singular statement. In what way, then, could the singular statement in question entail a law that involves considerations unmentioned in the singular statement? How could irrelevant predicates be employed to pick out correctly the causal sequences the singular statement reports? And in what sense are such singular statements "implicitly general"?

Donald Davidson has offered an appealing answer to these questions.<sup>10</sup> He distinguishes between stronger and weaker versions of the thesis that singular causal statements are implicitly general. On the strong version, a singular causal statement, employing predicates "X" and "Y" to describe its relata (the par-

10. Donald Davidson, "Causal Relations," *Journal of Philosophy* 64 (1967), pp. 691f, 697, 701f. Cf. also his "Actions, Reasons, and Causes," *Journal of Philosophy* 60 (1963), pp. 685-700, as reprinted in B. Berofsky, ed., *Free-Will and Determinism* (New York: Harper & Row, 1966), pp. 236f. Some features of Davidson's analysis were anticipated by Hume's Scottish successor, Thomas Brown (1778-1820). See his *Inquiry into the Relation of Cause and Effect* (London, 3rd ed., 1818).



ticular cause,  $x$ , and its effect,  $y$ ), entails a general statement of conditional form, whose antecedent and consequent predicates consist in, or at least include "X" and "Y." On a weak interpretation of the condition of implicit generality, the truth of the singular statement entails that there are some true descriptions of  $x$  and  $y$ , the cause and effect, and that there is some general law employing the predicates that figure in these descriptions, from which the singular statement in question follows, on appropriate substitution of co-referential descriptions. This interpretation is weaker than the former because no particular law employing predicates "X" and "Y" is directly entailed by ordinary statements that employ these predicates, and the truth of such a statement can be defended without having to defend any particular law.

Davidson's suggestions focus attention on the crucial, but easily overlooked, point that a distinction must firmly be drawn between causes (those events, states, or conditions that actually bring about an effect and that would be mentioned in one or more true causal laws) and those features of causal occasions generally cited in our *descriptions* of a cause and its effect. Following Davidson's lead, it is useful for us to distinguish further between the laws actually entailed by true singular causal statements and the general statements our descriptions of those causal occasions would entail if the singular statements were generalized. In Hume's formula "all the *objects similar to x* are followed contiguously by *objects similar to y*," common sense will lead one to focus attention on objects similar to  $x$  (under a certain description). Even ordinary causal generalizations reflect this fact (e.g., "life preservers—or aluminum boats, or buoys, or logs—cause persons to float"). But any universally true causal law will focus attention not on the objects but on the relevant similarities  $x$  possesses in common with other objects (e.g., its shape, density of material, etc.). In short, the Uniformity and Universality Specifications must be tightened to assert that a condition of causal laws is formulation *purely* in terms of universally connected features. Accordingly, the terms ordinarily used to describe causally connected objects may differ radically from the descriptive predicates that appear in those causal laws governing the cited sequences. In most cases, only precisely formulated laws that refer to specific but quite general features will not violate the Uniformity and Universality Specifications.

The relation of Hume's two specifications to singular causal statements may now be clarified further. The Uniformity Specification governs instances as follows: the antecedent condition terms in a constant conjunction statement of law  $c$  may be employed to describe correctly one or more features of each instance of  $c$ 's antecedent, and the consequent condition terms in  $c$  correctly describe one or more features of each instance of  $c$ 's consequent. The Universality Specification relates to instances as follows: if  $s$  is a singular causal statement of the form " $x$  caused  $y$ ," then  $s$  may entail no particular law but it does entail that there exists a universally quantified conditional statement, containing among its antecedents a predicate  $x$  instantiates and as its consequent a predicate  $y$  instantiates.

Although it is not clear whether Davidson explicitly attributes either the strong or the weak version of the claim of implicit generality to Hume's writings, it is plausible to attribute the more acceptable of these two accounts to Hume. Two passages in particular support this contention. First, in the section on Rules, Hume offers two principles, which, he says, "hang upon" what we have called uniformity-universality requirements:

- (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. . . . When in any instance we find our expectation to be disappointed, we must conclude that this irregularity proceeds from some difference in the causes. (T, 174)

In some late sections of the first *Enquiry*, Hume augments these familiar inductive principles with a warning against carelessly attributing irrelevant conditions to causes:

When we infer any particular cause from an effect, we must proportion the one to the other, and can never be allowed to ascribe to the cause any qualities, but what are exactly sufficient to produce the effect. . . . If the cause, assigned for any effect, be not sufficient to produce it, we must either reject that cause, or *add to it such qualities as will give it a just proportion to the effect.* (EHU, Sec. 105, emphasis added)

Hume misleads us somewhat by saying we ascribe causation "wherein we discover the resemblance." Davidson correctly main-

tains that we may discover a shared quality of causal instances, yet not have hit upon true causal features. Still, Hume's broad formulation produces no major problem. Perhaps he means "discoverable common quality" (as at EHU, Sec. 68, for instance), not "discovered common quality." He commonly assumes a distinction between causal ascriptions and correct causal ascriptions, as the passage from the *Enquiry* suggests. At any rate, it seems obvious that Hume would not quarrel with Davidson's constructive claims (cf. T, 139, 175).

Moreover, Hume appears to anticipate Davidson's views in his discussions of unknown and hidden causes. Hume often admits that there may be qualities that account for causal relatedness other than the "superficial qualities" we commonly cite (EHU, Secs. 29, 31). Sometimes it appears that Hume is not serious and might be parodying Locke in his comments on hidden causes. But at other points, he is clearly pressing a thesis. He argues, for example, that while we often attribute causal agency to objects that only "irregularly and uncertainly" produce a particular effect (opium irregularly causes sleep), philosophers do not presume that such objects, as experienced, are causes. Rather, they suppose that there are "some secret causes in the structure of the parts" that are either operative or prevent the operation (EHU, Secs. 47, 67; T, 132). The causal laws of which such cases are instances he also proclaims secret, i.e., undisclosed. In such cases as "pestilence, earthquakes, and prodigies," says Hume, we believe there is a causal relation, yet we are "at a loss to assign a proper cause" (EHU, Sec. 54). He explains this loss as follows: "The circumstance, on which the effect depends, is frequently involved in other circumstances, which are foreign and extrinsic. The separation of it often requires great attention, accuracy, and subtilty" (EHU, Sec. 84n). Hume is again arguing that one may be aware of particular causal sequences without being aware either of exact causal factors or of the causal laws governing the sequences observed.

Hume's conclusion seems to be the one Davidson argues for: while singular causal statements do not entail any particular law, they do entail that there is a law. Perhaps the first clause in this conclusion should be elaborated in the following way: one may know that particular causal sequences occur without knowing the precise causal laws that govern them; and, fur-

thermore, the *meaning* of singular causal reports of such sequences does not include the citation of a particular law. Hume's insistence that there is no well-founded attribution of causal relatedness to individual sequences without the support of past experience, analogical reasoning from such experience, or belief acquired through education, is thus clearly compatible with Davidson's approach to implicit generality. While Davidson's argument centers on the meaning of causal statements and Hume's on a claim about the epistemic basis of such statements, they are perfectly complementary.

Moreover, Davidson's clarification of the relations between causal laws and causal instances and our extension of it serve to undercut two important objections that have been lodged against Hume's regularity theory. The first may be called the Irregular Cause Problem, and the second the Singular Cause Problem. We consider them in turn in the next two sections.

## V

*The Irregular Cause Problem.* It has repeatedly been claimed by philosophers that some true causal citations do not conform to the requirement of regular succession. One particularly interesting example of this objection has been advanced by Fred Dretske and Aaron Snyder. They provide alleged counterexamples to Hume's view, which they in turn use to support a theory of causal irregularity. The chief counterexample involves a randomizing device R that proceeds, upon activation, to one of its one hundred different terminal states (each equiprobable). Attached to R is a revolver that fires when and only when the terminal state is number 17. If we place this device next to a cat, point the revolver at the cat, activate R, and the cat is killed, then according to ordinary causal thinking we have killed the cat, even though the improbable has occurred. The distinctive Snyder-Dretske thesis emerges from this example:

Though we designate our actions as the cause, and the cat's death as the result, there is no regular or uniform connection between actions of the first sort and results of the latter sort. If we should perform in the same way under *identical circumstances*, more often than not (roughly 99% of the time) the cat would survive. . . . [Here] in iden-

tical circumstances something of type *C* will not even generally be followed by something of type *E*.<sup>11</sup>

In one important sense the described circumstances do provide an example of causal irregularity. But the authors fail to answer the pertinent and most difficult questions forced by the Hume-Davidson analysis. Consider again Hume's discussions of unknown and hidden causes. As we saw, he contends that while we often attribute causal efficacy to objects that only "irregularly and uncertainly" produce a particular effect, philosophers suppose there to be "some secret causes, in the structure of parts," that are either operative or preventive. Because the causal laws are also undiscovered, we should distinguish, in cases such as the Snyder-Dretske example, between the regularities entailed by true singular causal statements and the general statements our descriptions of those causal occasions would entail if the known singular relation were generalized. No proponent of the Regularity Theory would unguardedly admit that the antecedent conditions Dretske and Snyder describe as type *C* events are relevantly similar to the conditions that actually cause the death of the cat. Regularity theorists would insist that until the description of type *C* events is divided into types  $C_1, C_2, \dots, C_{100}$ , one has merely described some obviously causal occasion without identifying the exact cause.

The peculiarities of a randomizing device fail to diminish the force of this argument. An advocate of the regularity theory would not concede that the criteria for a proper nomological description of events of type *C* are satisfied by a description such as "activating a randomizing device." This event is *part* of the cause—indeed it is a contingently necessary condition—but adequate and precise descriptions of type *C* events would include both the sufficient and the necessary conditions for type *E* events. In the case of a randomizing device the conditions would have to be those sufficient both for landing in state number 17 and for killing the cat. Here several laws might be involved.

Holding to their objection from causal irregularity, Dretske and Snyder have responded to one possible line of criticism as follows:

11. F. I. Dretske and A. Snyder, "Causal Irregularity," *Philosophy of Science* 39 (1972), p. 70 (emphasis added).

... it is unclear how we could redescribe our action so as to include conditions "sufficient both for landing in state number 17 and for the killing of the cat"—since, so far as is known, there are no conditions which are sufficient (in the sense of "subsumable under causal laws") for the electron's landing in state number 17. . . . [If the suggestion is] that we can redescribe *what we did* as "putting the electron in state number 17" and, under this description, have something that is part of some causally sufficient condition for the cat's death, [this] is certainly right. But [it] implicitly concede[s] the very point for which we were arguing. For if we can be said to have put the electron in state number 17, despite the acknowledged lack of any causal regularity, then we can also be said to have killed the cat. The conclusion remains that either we can do things that bear no causal connection to our immediate actions, or else causal connections do not require regularity.<sup>12</sup>

This conclusion is fallaciously drawn, even though Dretske and Snyder do correctly see the line of argument a defender of the regularity theory must take. Suppose one can, as they suggest, redescribe the agent's action as "putting the electron in state number 17." We know, based on what they say, that the following causal generalization is true:

Whenever the electron is put in state number 17, then (given the stipulated circumstances) the cat dies.

We also know that a generalization based on any other activating action (e.g. putting the electron in state number 16) is false. These formulations demonstrate that when we are sufficiently precise in our descriptions of events and reach a true causal generalization, we have located the cause, and when we are sufficiently imprecise we say something that is either false or misleading. They also reveal the irrelevance of injecting, as Dretske and Snyder do, the reminder that there is an "acknowledged lack of any causal regularity." At the appropriate link in the chain from activation of *R* to the cat's death there is no lack of causal regularity at all, for the generalization cited above is universal, uniform, and true. There is, of course, a *noncausal* irregularity in their example between activating the machine and its landing in state number 17, since (as they hy-

12. F. I. Dretske and A. Snyder, "Causality and Sufficiency: Reply to Beauchamp," *Philosophy of Science* 40 (1973), p. 289.



pothesize) there was an "event which was perfectly random and had no cause."<sup>13</sup> But this noncausal occurrence is irrelevant (as they correctly see) to whether the activator caused the cat's death (he did); nor does it figure in any way in the proper causal law. In short, the randomizing device example is irrelevant and is shown to be irrelevant, as was originally suggested, by a correct redescription of the human action as one of placing the electron in state number 17 (where, of course, there is a perfect causal regularity with the death of the cat). Because of this regularity we recognize that the action is the cause of the cat's death; if there were no such regularity, then either the actor did not cause the death or else the death resulted from some other action (describable using the appropriate terms).

Dretske and Snyder may have still another rejoinder, one which they seem to anticipate. They argue that if one focuses on the effect "landing in state number 17," and asks for its cause, it appears that the activation of the machine caused the effect of landing in state number 17, even though these two events are irregularly connected. And this is indeed a somewhat more interesting example than the cat's death, because there is without question an irregular relation between activating R, and the device's landing in state 17. Dretske and Snyder argue that there is a causal relation here, too, because "there are no conditions other than C [the activating act] which are necessary for E [landing in 17] for which C is not already sufficient."<sup>14</sup> Hence, C is causally sufficient for E.

But this claim too is mistaken. It may be admitted that the act of activating R at least partially *explains* why R landed in state 17, once we understand both how randomizing devices operate and that the probability of landing in 17 was 0.01. But we would not say that the activating act *caused* R to land in state 17. The action in question, activating R, may be described as the event that caused the electron to land in one of the one hundred terminals, but not to land in 17 in particular.

This perhaps unappealing claim does not simply beg the question by insisting on a regularity account while invoking Davidson's theory of redescription. It follows from what Dretske and

13. Dretske and Snyder, "Causal Irregularity," p. 70.

14. Dretske and Snyder, "Causality and Sufficiency," p. 291.

Snyder themselves say. They say that settling in state number 17 was a "random event" that was "not causally determined." Yet, they say, it was not an uncaused event: "our activating the device was causally sufficient for its settling in state number 17, and consequently for the cat's death, in the sense that nothing further was necessary, in that particular case, for either of those results." But something else was necessary in that particular case, viz., a random occurrence. According to their own account of causation, after which the previous quotation is patterned, "in calling a condition S sufficient for E, we mean that there are no conditions other than C which are necessary for E for which C is not already sufficient."<sup>15</sup> The question, then, is whether C was "already sufficient" for the random occurrence that led to E. The answer seems obviously to be that it was not causally sufficient, no matter what account of sufficiency one employs. For nothing could, on their own definition, be causally sufficient for the *purely random* occurrence. It is a random, accidental occurrence; hence, the act of activating the device does not *cause* the landing in 17. At most it causes R to land in some terminal or other. And this is good regularity doctrine, whether Hume's or Davidson's. [Note also that the Dretske-Snyder analysis of causal sufficiency comes precariously close to begging the question by repeating "sufficiency" in the analysis.]

Dretske and Snyder have perhaps confused causal irregularity with causal accidentality. If, during an air raid, bombs are dropped that cause the unanticipated deaths of children in regions remote from the target, the deaths will be described as an accident (in part because their probability is low) but not as a case of causal irregularity. It may be that the case of killing the cat is similarly improbable, but not irregular. The air raid example again illustrates the importance of a proper description of the actions involved. None would deny that bombing under the fully described conditions always results in the death of distant children. Similarly we should not deny that activating a randomizing device under the appropriate description (say, Dretske's and Snyder's "putting the electron in state number 17") will always result in the death of appropriately distant cats.

15. *Ibid.*

The real problem of randomness is at once more and less serious than proponents of causal irregularity recognize. Where there is genuine randomness, there is no causation at all, as Dretske and Snyder seem to recognize: an "event which [is] perfectly random . . . [has] no cause."<sup>16</sup> It is therefore no counterexample to the regularity thesis that causation consists in regularities that are not just nonrandom, but strictly universal. But suppose, as the current orthodoxy in the interpretation of quantum mechanics suggests, that the fundamental laws of nature are not strictly universal, but are irreducibly statistical. What will the upshot be for the Humean? Here the problems of causal irregularity become more serious than philosophers such as Dretske and Snyder have imagined. Suppose it turns out that all events are related to one another in the irreducibly stochastic way that a quantum mechanical randomizing device's states are alleged to be related. If the fundamental laws of physics are statistical in character, then the apparently deterministic phenomena at the macroscopic level will correctly be described by statements, deducible from the statistical quantum laws, that are themselves only deterministic in the unattainable limit, as Planck's constant approaches zero by comparison to values of macroscopically measured values.

This possibility, not envisioned by Hume, must have serious repercussions for his theory of causation, because it appears to deny the existence of the constant conjunctions in which causation consists. Thus, given an event of either macro- or micro-physical character, the most fundamental law of working will not restrict its successor to one and only one kind, but will at best specify a class of different kinds of successors with varying degrees of probability. Because at the level of macroscopic events the probability distribution is so heavily skewed that the probability of one particular successor approaches 1.00, we mistake the sequence for a deterministic one when in fact it is essentially statistical. But if there are no true universal and uniform laws, there is no Humean causation, anywhere. If in the light of this conditional we nevertheless embrace the truth of at least one singular statement of causal relatedness between two particular events, we are *ipso facto* committed to rejecting Hume's account of causation as false.

16. *Ibid.*

How can the Humean reply to this argument? The safest reply is that the philosophy of physics is currently in an unsettled state, and problems surrounding the interpretation of quantum mechanics remain insufficiently resolved to enable one particular view of this theory to refute a theory of causation that has so much to recommend it. For it is by no means agreed that quantum mechanics is most plausibly construed as irreducibly statistical or indeterministic. Numerous exponents of hidden variable theories claim that underlying deterministic mechanisms may eventually be found to which quantum phenomena are reducible. Others, following Ernest Nagel,<sup>17</sup> argue that in all important respects quantum mechanics is a deterministic theory after all. Nagel points out that the Schrödinger wave equation expressing the fundamental regularity of the theory is not a probability formula, but a differential equation of the same form (providing single-valued time dependent solutions) as the equations expressing deterministic Newtonian mechanics. The difference between Newtonian and quantum mechanics, in Nagel's view, rests on differences between the state-descriptions that the two theories both deterministically relate. The fundamental states of objects in Newtonian mechanics are given by their values of momentum and position; the parallel states for quantum mechanical objects are given by the so-called  $\Psi$ -function. The appearance of irreducible probability is generated for quantum mechanics by the fact that the only plausible interpretation available for the  $\Psi$ -function involves treating the square of its absolute value as a measure of the probability that an object will have the classical state-variable properties at a given time. The Humean may take over this argument and claim that if the states accorded to objects by quantum mechanics can satisfy the requirements of spatiotemporal contiguity and succession, then the deterministic character of the fundamental equation of quantum mechanics assures that these objects will engage in causal relations of the sort Hume envisaged.

The trouble with this line of counterargument, aside from the fact that it rests on an interpretation of quantum mechanics at least as controversial as the one attributed to anti-Humeans,

17. Ernest Nagel, *The Structure of Science* (New York: Harcourt, Brace & World, 1961), Chapter 10.

is that it is uncertain whether objects can satisfy the requirements of contiguity and succession. That is, these requirements were initially established in the light of Newtonian assumptions that the fundamental states of objects are their exact position and momentum. The deterministic interpretation of quantum mechanics obliges us to surrender this assumption, and to replace it with the supposition that objects are fundamentally characterized by their  $\Psi$ -functions. But at present the  $\Psi$ -function is either uninterpreted or interpreted in terms of irreducible objects having only probable position and momentum. In the former case, we cannot tell whether objects satisfy the requirements of spatiotemporal location that position and momentum provide, while the latter alternative obviously renders quantum mechanics incompatible with the Humean account of deterministic causality. This dilemma for the Humean illustrates why it is perhaps best simply to say that arguments from quantum mechanics involve premises that are too controversial to settle any matters in the present connection.

Other Humean responses to the absence of strictly universal and uniform laws also deserve consideration. One strong rejoinder is to admit that without such laws there is no causality whatever, and that the concept of cause will then have no correct application to any actual sequence. Of course the Humean will only agree to this admission if his opponents accept the challenge of showing, in the absence of universal and uniform laws, what difference there is between the causal sequences they seek to retain and accidental sequences. If Humean arguments to show our inability to distinguish causal sequences from accidental ones without appeal to regularities are sound, opponents will be unable to substantiate their claim that causality obtains in an indeterministic world, because they will be unable to distinguish causal and accidental sequences.

It will not do to argue in reply that causation obtains in any sequence reflecting a probabilistic regularity at some particular level above chance. There will be no detectable difference between accidental sequences that reflect the particular level of probability in question and the most fundamental (and therefore unexplainable) statistical regularity of quantum mechanics associating kinds of events at exactly the same level of probability. We cannot ground causation on irreducible statistical laws, quantum mechanical or otherwise, for the fundamental status

of these laws excludes their nomological explanation as surely as the accidental status of a nonnomological statistical regularity excludes its wholly nomological explanation. Under these circumstances causal and accidental sequences will be indistinguishable. The following conclusion is the one we have suggested the Humean should support: if the fundamental "laws" of nature turn out to be statistical and not uniform and universal, there is no causation, and the concept has no correct applicability.

It is worth emphasizing again that Hume's is not an inquiry into the meaning of the expression "cause" as it figures in ordinary language. Appeals as to what we should say in ordinary or extraordinary contexts have little weight for Hume. He is concerned not with what we *believe* is true when a singular causal statement is true, but with what *is* invariably true when such a statement is true. If it turns out that on the only tenable account of the matter, given the facts of an ineliminable indeterminism, all singular causal statements are false, the analysis Hume offers will in no way be vitiated. His philosophical views do not entail the existential claim that there are true singular causal statements. To announce that there are paradigm cases of true singular causal statements is no part of an analysis of the notion of cause, unless the announcement is accompanied by an account of the differences between sequences that make the paradigm cases true and sequences that are noncausal. The latter endeavor transcends appeal to intuitions about particular cases.

## VI

*The Singular Cause Problem.* It has been argued that since Hume restricts inquiry into causation to the search for laws, his work makes no contribution to the analysis of singular causal statements as such or to inquiry concerning the character of the events, states, and conditions among which the causal relation obtains. This misconception of Hume's theory is due to an emphasis on causal laws out of proportion to their actual place in Hume's writings. C. J. Ducasse is representative:

If the engine of my car stops, and I ask "Why?", I am not asking for a statement of invariable succession or of a law, even though one may, conceivably, be inferable. . . . What I want to know is . . . the single



*difference* between the circumstances of the engine at the moment when it was running, and at the moment when it was not. . . . Constant conjunctions . . . would follow as a matter of course, if the cause and the conditions were repeated. But constant conjunction is then a *possible corollary, not the definition*, of causation. *To have mistaken it for the latter was Hume's epoch-making blunder. . . . [Hume and Mill believe] inquiry into causation is inquiry into laws. The truth is on the contrary that it is directly and primarily an inquiry concerning single, individual events.*<sup>18</sup>

This interpretation is not entirely groundless, but it obscures important subtleties in Hume's analysis. In Ducasse's interpretation Hume thinks causal inquiry is directly concerned with constant conjunctions and is not concerned, or is only indirectly concerned, with single cases. This emphasis is Ducasse's primary misconception.

Ducasse fails to see that on Hume's view even if a singular statement about an instance entails that a law exists, it is no less a singular statement about the instance. Saying "This hole in the radiator caused the car to break down" is on Hume's analysis neither equivalent to a law statement nor the result of an inquiry into a law, though the truth of the statement does entail that there is a universal law, known or unknown, subsuming the sequence described. Hume simply holds that whereas some relations are inherently relations between individuals regardless of the class to which they belong (spatial relations, e.g.), the causal relation holds between *individuals as instances* of specifiable classes. This analysis involves more than a mere verbal quibble with Ducasse. Hume grants that in any particular case what we "want to know," as Ducasse puts it, is the single difference between one set of circumstances and another. Indeed, one of Hume's previously cited passages could be mistaken for a quotation from Ducasse: "the circumstance, on which the effect depends, is frequently involved in other circumstances, which are foreign and extrinsic. The separation of it often requires great attention, accuracy, and subtilty" (EHU, Sec. 84n; cf. T, 148, 175). Hume affirms through his rules of induction the importance of inquiry into single differences and would agree that, as a matter of practical need, we are commonly interested in

18. C. J. Ducasse, *Causation and the Types of Necessity*, pp. 19, 21; also cf. p. 10. (Passages slightly rearranged, and some italics added.)

single differences and in single cases. He denies only that single differences can be *known* from absolutely singular cases.

This last observation points to a second difference between Hume and Ducasse, one regarding the conditions of causal knowledge. Hume's "epoch-making" epistemological twist is his claim that there is no identification, detection, or recognition of a causal relation without an appropriate background of experience. Ducasse disagrees. He thinks both that a sequence occurring only once can be causal and also that a particular sequence can be *known* through observation to be causal, even though it is unique, and therefore independent of any regularity or analogy to another regularity. Ducasse maintains that the individual causal sequence is primary and the general regularity secondary in the order of knowledge, and consequently in the analysis we may offer of the meaning of the concept. In this respect he is in agreement with Anscombe. Unlike Anscombe, however, Ducasse substantiates this commitment with an argument for the perceivability of causation. He claims that a set of changes C, composed of changes  $c_1, c_2, \dots, c_n$ , is the cause of an event E, in circumstances S (composed of C, E, and the set of irrelevant causal conditions I), if and only if C and E are the *only* two changes in S, and C can be distinguished from elements in I by *perception* in singular cases: "In any such concrete case observed, the causation which occurred was *not inferred* but was as literally *perceived* as were the concrete events it connected." Ducasse admits that perceptual mistakes are sometimes made about causation, but he attributes them to the fact that we have not succeeded in isolating the *only* change in circumstances:

It is difficult to make sure that no other occurred; but it is likewise difficult to make sure by observation that there is at a given time no mosquito in a given room, or no flea on a given dog. . . . Thus, theoretically, all that observation can yield is probability. . . . In many cases it is difficult or impossible to attain certainty that what we observe really conforms to the definition of the [causal] relation.

Ducasse has, in effect, described Mill's Method of Difference, which he takes to be a description or definition of the causal relation itself, not just a method for discovery or proof.<sup>19</sup>

19. *Ibid.*, pp. 147ff, and C. J. Ducasse, *Nature, Mind, and Death* (LaSalle, Ill.: Open Court, 1951), pp. 95, 105-7, 118-21. The two quotations are, respectively, from the former, p. 151, and from the latter, p. 119.

Ducasse is well aware of criticisms that it is difficult to ascertain the true cause by perceptual observation. He argues that if any doubt as to the conformity between observation and the definition of causation arises, then "additional observation can often dispose of the doubt and thus increase the probability."<sup>20</sup> This argument defends Ducasse's claims only by weakening them to the degree that Hume rests unrefuted. Hume never denies that hypotheses about proper causes can be framed on the basis of single occasions; and he notoriously agrees that experience in the form of "additional observations" increases the probability of accuracy. Hume merely denies that the relation itself is ever directly perceived or that we know by single perception which changes are the causal ones. It is the second of these claims that Ducasse must refute, and yet he fails to do so. Even certain of Ducasse's proponents have apparently recognized this defect. Among them, Edward Madden and James Humber write:

In perceiving the complex change, . . . did we directly observe the causal relation? Ducasse answers "yes" because we experienced what was in fact sufficient to *E*, even though what we experienced was more than sufficient. It seems to us, however, that the correct answer is "no" because there is a difference between experiencing the cause of *E* and experiencing something as the cause of *E*. Ducasse confuses the two notions. He is right in saying that one has perceived what is the cause of *E* but wrong in thinking that one thereby has perceived *x* as the cause of *E*. Given any complex change, one cannot claim to have experienced the whole of it or any part of it as the cause of *E* because what the cause of *E* is can be known in such cases only inferentially.<sup>21</sup>

In order to show both that causation is perceivable in particular sequences and that it is not an unanalyzable notion, Ducasse would have to show precisely which features of perceptual experience distinguish causes from noncauses. It would not suffice to show which features merely distinguish causes from irrelevant conditions or from changes that are accidental concomitants. Otherwise the initial question of how we are to distinguish causal and noncausal changes in a non-Humean way

20. Ducasse, *Nature, Mind, and Death*, pp. 113-25. Quotation p. 119.

21. Edward Madden and James Humber, "Nonlogical Necessity and C. J. Ducasse," *Ratio* 13 (1971); and reprinted in Beauchamp, ed., *Philosophical Problems of Causation, op. cit.*, p. 170.

is begged. Ducasse never provides such differentia as features of immediate perceptual experience alone, and his explanations invariably make tacit appeal to influential knowledge from other cases. In the end his account seems indistinguishable from Hume's.

In order to test Ducasse's views against Hume's, imagine a quite ordinary case of "perceiving" causation. Suppose an apprentice painter adds a blue substance to a can of white paint and stirs. He notices that the paint gradually thickens after these two initial changes. The blue substance, he thinks (or should we say perceives?), is not only coloring the can's contents but is also thickening them. He repeats the experiment with the same result. But now he wants a can of white paint, so he stirs the original paint without adding any of the blue substance. To his surprise it thickens in the same way, and just as rapidly. The stirring, not the added ingredient, has caused the thickening. Hume's Rules (Mill's Methods) tell the apprentice how to obtain this result ("with probability"), but how is he to know it on Ducasse's account? Following the latter, he would know by perception that the thickening is caused by the blue agent or the agent together with the stirring, since these are the only changes introduced; but he would not know that the stirring alone is the cause.

The fact that we thus relinquish our initial causal beliefs based on perception if similar instances prove us wrong simply reflects Hume's analysis and its commitments to generality in causal knowledge. The fact that one genuine counterinstance proves us wrong in such cases tends to show that we implicitly think regularities are involved. Our powers of perception in singular cases are sufficient, then, to inform us which changes are causes. Matters only become more difficult as the changes in circumstances *S* are multiplied, for an increasing number of tests will be needed to discriminate causally relevant changes from irrelevant ones.<sup>22</sup> But if this is what Ducasse means in the passage above about "additional observation," then his account and Hume's still remain indistinguishable.

This example is not one unfairly foisted on Ducasse, for his own examples encounter the same problem:

22. In Hume, cf. EHU, Secs. 105, 84n; T, 173-75.

The other day, the dash lamp of the automobile I was in failed to light on my turning the switch. But when I fumbled at random in the mess of wires under the dash, the light flickered on. *Postulating* then that neither the barking of the dogs on the other side of town, nor any of the other changes which I did not observe taking place *were causally relevant* to the light's flickering on, I at once *concluded* that "what I had done" was the cause of it. Having thus identified the cause perceptually. . . .<sup>23</sup>

In this example the mentioned extraneous feature is obviously irrelevant, but if other changes had simultaneously obtained inside the car, could the "cause" have been so readily ascertained? Moreover, as Hume noticed, the "perception" of causation commonly requires sorting relevant and irrelevant features through analogy from previous experience of constant conjunctions. Ducasse may be revising the meaning of "perception" to include processes of reasoning, such as the elimination of alternative hypotheses, but then his theory clearly caves into Hume's. However, this interpretation of "perception" is not plausible as a rendering of Ducasse's meaning, for he often argues that knowledge of constant conjunctions and causal generalizations has nothing to do with the perception of causation. Indeed, Hume's "epoch-making blunder" allegedly lies in his failure to distinguish the two.

In addition to these problems concerning perception, it is doubtful that an analysis in terms of individual changes in preceding circumstances captures what is ordinarily meant by "cause," despite Ducasse's claim to have done so. In the first place, cause is not commonly distinguished from conditions in the way he suggests. The immediate single difference is not causally sufficient, by his own admission; and in many contexts it is not generally thought to be the cause at all. Suppose a roll of thunder is followed by the bursting of a dam—a structure, it is discovered, which was inadequately designed and built below specifications. Both the actions of the designer and contractor and the standing bulk of water are causal conditions capable of being isolated as the cause. There is a temporal gap between the former causal occasion and the cited effect, while the water and the construction materials are standing conditions in the set of

23. Ducasse, *Causation and the Types of Necessity*, p. 78. (Italics added.)

irrelevant conditions I just before the occurrence of the effect, not changes in C. Furthermore, the roll of thunder may or may not be causally relevant. Suppose a long-term erosion of concrete is actually the precipitating factor. Are we to say that only the last slight chink of erosion is causally sufficient? Even if we knew that this latter change alone had occurred in the circumstances, would it be the cause? We argue in Chapter 5 that Hume has a convincing answer to these questions, based on his account of contiguity and succession—a thesis on which he and Ducasse may in the end agree. That point, however, is presently irrelevant. We wish only to observe that Ducasse's analysis fails to capture the ordinary meaning of "cause," despite his oft-repeated claim to have done so and thereby to have bested Hume.

In at least one further respect Ducasse's view is indisputably at variance with Hume's. Ducasse insists that the cause of an engine's stopping is the single difference between "the circumstances of the engine at the moment when it was running, and at the moment when it was not." If this change is the sole instance of its type, and constituted the sole change in the circumstances, then it is the cause regardless of whether the sequence would or would not occur in exactly similar circumstances. Up to a point the regularity theorist agrees that qualitatively unique and unrepeated sequences may be causal. Regularity accounts say only that apart from analogical reasoning we cannot *know* that such sequences are causal, even though they may be unique instances of regularities. The Humean, then, will disagree specifically with Ducasse's claim that "the observing of . . . recurrence is theoretically *unnecessary* to the *identification* of cases of causation." If there can be no analogical comprehension whatever under "any known species," as Hume puts it, then there can be no "conjecture or inference at all" (EHU, Sec. 115). Humeans need not disagree that recurrence is theoretically unnecessary to the sequence's *being* a causal instance. The metaphysical issue for Hume is not the contingent matter of whether the type of sequence in question is in fact repeated, but whether the type of sequence instanced is invariable and unconditional regardless of *de facto* repetition.

This disagreement hinges on Ducasse's modal claim that an unrepeated sequence would be causal even were it not to recur at other times and places *where the same circumstances obtain*.



This view entails the dubious claim that causal statements fail to support counterfactual conditional statements. The disagreement thus depends on the character of modal and counterfactual claims and their bearing on singular factual ones. This matter will be taken up in the next chapter. It may now be observed, however, that the present dispute is not limited to a disagreement between Humeans and anti-Humeans similar to Ducasse. The dispute is between Ducasse and all others interested in analyzing causation, including many of Hume's most formidable opponents. It is now everywhere acknowledged that causal claims have counterfactual force. The issues that currently separate philosophers concern the explanation of this force. Perhaps these philosophers are mistaken on this fundamental matter, but we find no argument in Ducasse or elsewhere to support such a view.

## VII

One passage in the *Treatise* seems inconsistent with Hume's teaching that more than one experience is required for knowledge of causal relatedness. This passage may seem to sustain Ducasse's view of the matter:

'Tis certain, that not only in philosophy, but even in common life, we may attain the knowledge of a particular cause merely by one experiment, provided it be made with judgment, and after a careful removal of all foreign and superfluous circumstances. (T, 104; cf. EHU, Sec. 84<sup>n</sup>)

Hume recognizes that if causation consists in *de facto* constancy, and if causal inference requires customary expectation acquired by repetition of sequence, then multiple instances would be essential and causal knowledge would therefore seem inexplicable in cases of singular causation. He responds to this objection with the argument that

tho' we are here suppos'd to have had only one experiment of a particular effect, yet we have many millions to convince us of this principle; that like objects, plac'd in like circumstances, will always produce like effects; and as this principle has establish'd itself by a sufficient custom, it bestows an evidence and firmness on any opinion, to which it can be apply'd. (T, 105)

Employing an argument independent of those previously considered, Ducasse vigorously attacks this line of reasoning. He argues that this passage presupposes his own common sense singularism and constitutes an inconsistency in Hume's regularity theory. He alleges inconsistency because the principle to which Hume appeals would allow the generalizing of any observed singular sequence whatsoever—causal or accidental. Hume's stipulation about careful removal of superfluous circumstances fails to resolve the problem, Ducasse argues, for how could the superfluous conditions be identified on the basis of a single experiment? Such a procedure would have to involve the separation of relevant causal conditions from irrelevant ones, as occurs according to Ducasse's own theory. Yet the principle of same cause, same effect cannot itself provide this singular knowledge. From these premises Ducasse reaches two conclusions: (1) Hume's principle has "valid applicability" not for the discovery of causal sequences but only for their generalization after they have been discovered; (2) If causal relations can be discovered by single experiences, then causal relatedness may entail, but does not consist in, constancy of sequence.<sup>24</sup>

If Ducasse's interpretation of Hume were correct, his critical conclusions could not be gainsaid. But Hume has again been misinterpreted. He never allows that causal relations are discovered or even suspected in the case of objects with which an observer is entirely unfamiliar. Indeed, he steadfastly adheres to a principle which, he says, "admits of no exception": "Let an object be presented to a man of ever so strong natural reason and abilities; if that object be entirely new to him, he will not be able, by the most accurate examination of its sensible qualities, to discover any of its causes or effects; . . . nor can our reason, unassisted by experience, ever draw any inference" (EHU, Sec. 23). Ducasse apparently interprets Hume to have maintained that an observer need only be mentally equipped with the principle "like causes, like effects" and need not have previous knowledge of the object itself or of the circumstances in which it is found in order to infer causal relations. But Hume is not

24. Ducasse, *Nature, Mind, and Death*, pp. 96f; *Causation and the Types of Necessity*, pp. 10-13; and "Critique of Hume's Conception of Causality," *The Journal of Philosophy* 63 (1966), pp. 144f, as reprinted in *Philosophical Problems of Causation, op. cit.*, pp. 8f.

tempted by this view; he consistently argues that all reasoning concerning matters of fact is based on the relation of cause and effect *and analogy therefrom*. We interpret Hume to mean that knowledge of three distinct sorts is required for causal inference in single cases. Such inferences can occur only if the observer is acquainted with the causal irrelevance of certain background conditions, the observer is capable of some identifying "judgments" about the object prior to the actual experiment, and the observer is capable of reasoning analogically, within this epistemic framework, from the principle "like causes, like effects."<sup>25</sup>

An example will illustrate these three epistemic elements. Suppose Karl, who has only a common knowledge of fruits, is handed a young persimmon by his friend Ludwig, who requests that he taste it and give his reaction. Since Karl has just subjected his mouth to an astringent mouthwash, he waits until this "foreign circumstance" is no longer capable of spoiling the experiment. Meanwhile, he checks for bruises that would distort the natural taste. And since he is aware that the juice of some fruits tastes rather different from the fruit itself, he carefully slices a sector and only then deposits it in his mouth. He immediately experiences the tart bitterness and puckering sensation produced by persimmons. He thinks every bite of a persimmon will produce the same result. Why? Roughly, we maintain, for the reasons Hume gives. Karl does not think he is being deceived by the experiment because he was meticulously cautious in probing and eliminating foreign circumstances. He expects the same result to follow in a similar experiment because he has found this principle to obtain so regularly in the past. Of course he does not yet know all the relevant variables that could contribute to his knowledge of the fruit's qualities. He is not aware, for example, that the persimmon must not be softened by frost since after softening it turns sweet and delicious. This knowledge can be obtained only through further experimentation.

A similar single-experiment pattern is employed in applied sciences. All known variables are kept perfectly constant prior

25. On the importance of analogy in general for Hume, see James Noxon, *Hume's Philosophical Development: A Study of His Methods* (Oxford: Clarendon Press, 1973), Part III, Sec. 4.

to the introduction of some new factor. A scientist working on the effects of a chemical substance, for example, may go to elaborate lengths before the experiment to determine the health status of his rats, the nutritional value of their food, the purity of their genetic strain, the uniformity of their cages, the regularity of their handling, etc. If the rats immediately die, and it is known that needle injections themselves cause no harm, the scientist will be confident that his chemical substance and no other factor is the cause. If instead of death he merely observes a chromosome breakage several days after the injection, he may be less confident of a causal relation. But in either case he would probably be willing, if requested, to hypothesize certain undetected conditions which might have been present and which, if discovered, would refute the causal claim, even though he has at present no reason to suspect that such undetected conditions actually obtain.

On Hume's argument causal inference through analogical reasoning beyond immediate experimental contexts is not precluded, and may be useful in the formulation of testable hypotheses. His larger point seems to be that it is possible to reason by elimination of alternative hypotheses until the sole relevant causal factor is reached, provided that (1) the context is relatively simple (cf. EHU, Sec. 84n), (2) some features of the objects involved are known, and (3) belief in the principle that like causes produce like effects is present. This appeal to elimination is to be expected from a defender of the regularity theory.<sup>26</sup>

## VIII

One potential problem in this defense of Hume lies in the insufficiently analyzed phrase "relevant respects"—or essential rather than accidental circumstances, in Hume's language. Richard Taylor has argued that regularity theorists fail on at least two counts in their use of this notion. On the one hand, Taylor argues, the notion is otiose as an analysis of the causal relation, for to analyze causation in terms of causally relevant respects

26. In addition to our arguments, J. L. Mackie correctly points out that causal generalizations provide vital evidence of the *irrelevance* of various changes in the spatiotemporal vicinity of the causal relation. *The Cement of the Universe* (Oxford: Clarendon Press, 1974), p. 122.

simply begs the question. Furthermore, according to Taylor, the constant conjunction theory cannot satisfactorily explain how irrelevant conditions are to be distinguished from relevant ones, for some irrelevant conditions present in accidental (noncausal) constant conjunctions would have to be declared causally relevant by defenders of a pure regularity theory. A diverse set of true general statements about constantly conjoined features with plural instances could thus be constructed that we would know to be noncausal, but that the regularity doctrine would nevertheless identify as causal. For example, says Taylor, suppose a carload of matches has some unique combination of marks that distinguishes the matches (omnitemporally) from all other matches: "we could then rub each in a certain way and, if all of them in fact ignited, it would then be *true* that *any* match that has those properties ignites when rubbed in that fashion." Taylor concludes from this argument that the upholders of the constant conjunction tradition cannot legitimately account for the crucial distinction between relevant and irrelevant features, even though they have repeatedly resorted to its use.<sup>27</sup> This objection to Hume is at least as old as Thomas Reid's but is no more convincing for its updated terminology. Hume's Rules are attempts to specify experimental procedures in accordance with which it can be determined whether some set of features of objects is *always* conjoined with another set. Using these Rules, an assumption of invariability (i.e., a causal relevance hypothesis) can be made prior to actual *belief* in causal relatedness and can subsequently be tested experimentally (T, 149, 173). Hume admits that this inductive procedure may be tedious, complex, and sometimes unsuccessful (EHU, Sec. 84n; T, 148f), but the most one can ask is that good evidence be presented for causal claims. Hume's Rules are his attempt to specify a procedure for the discovery of such evidence. The methods of eliminative induction, which he somewhat too economically expounds, stand in need of considerable improvement;<sup>28</sup> but there

27. Richard Taylor, "Causation," *Monist* 47 (1963), pp. 287-313, esp. pp. 293-96. Quotation p. 295.  
28. The Methods of Eliminative Induction, as applied to causation within the framework of a regularity theory, have been developed by J. R. Lucas, "Causation," in *Analytical Philosophy*, 1st Series, ed. R. J. Butler (Oxford: Basil Blackwell, 1962), and by J. L. Mackie, "Causes and Conditions," *op. cit.*, Section V, and *The Cement of the Universe*, Appendix.

is no philosophical problem with his basic suggestion that good eliminative procedures do succeed in eliminating irrelevant factors and suffice quite adequately as practical criteria of causal relevance. No question is begged. On the contrary, the constancy feature of the constant conjunction theory is taken seriously and given additional content, viz., that the genius of causal inquiry consists in discounting differences while recognizing similarities.

Undoubtedly critics of Hume such as Taylor would deny such a rebuttal. Methods of elimination, they would say, are used precisely to find causal laws that specify what would and would not happen under certain conditions. The notion of counterfactual sequence thus underlies Taylor's arguments from accidental relations, and it seems to him clearly incompatible with Hume's emphasis on *de facto* conjunction:

Sometimes difficulties of the kind suggested have been countered by introducing the idea of a *law* into the description of causal connections. . . . [Causes] must, according to this suggestion, be exactly similar in certain respects only, and can be as dissimilar as one pleases in other respects. But here we shall find that, by introducing the idea of a law, we have tacitly re-introduced the idea of a necessary connection between cause and effect—precisely the thing we were trying to avoid. A general statement counts as a *law* only if we can use it to infer, not only what does happen, but what would happen if something else were to happen, and this we can never do from a statement that is merely a true general statement.<sup>29</sup>

What Taylor here claims can never be accomplished using a constant conjunction theory is precisely what Hume, or his modern followers at least, must and can do with consistency. The next chapter as a whole is an argument to defend this claim.

In this chapter we have marshaled arguments, building on those of the first two chapters, to expound Hume's doctrine of the implicit generality of singular causal instances. We first offered a Humean account of the laws that make for this implicit generality. Then we turned to counterexamples and counterarguments that suggest the primacy of causal instances over causal laws. We have been pulled progressively away from conceptual issues concerning the nature of laws and their relation to causal sequences, and have been drawn progressively closer

29. Taylor, "Causation," pp. 294-95.



to the epistemic conditions underlying our causal beliefs. This direction of argument should not be surprising. Attacks on Hume's conception of the implicit generality of causal sequences have rarely been based on a rejection of the truth conditions. Rather, Hume poses for singular causal statements and laws. His opponents have appealed to certain basic beliefs about causal sequences and causal laws, on the assumption that some of these beliefs are both true and incompatible with the Humean theory of causation. The beliefs in question are, most prominently, the counterfactual ones to which Taylor appeals in the passage above. In accounting for these beliefs, a Humean too must shift the focus; from the truth conditions of causal claims attention must be directed to the *evidence* we marshal on behalf of these claims.

In the next chapter we turn to the question of whether the regularity theory can explain the counterfactual force of causal statements. Our intent is to supplement the answers offered in this chapter. In later chapters we shall add a Humean theory of the *relata* of singular causal sequences, as well as further arguments against the objections to Hume canvassed so far. These inquiries bulk large as answers to the questions posed in this chapter. In this respect our defense of the Humean theory about the relation between causal laws and causal instances will not be complete until the final chapter.

## 4

## Law, Accident, Necessity, and Counterfactuals

WE HAVE SEEN how Hume substitutes implicit generality for the necessary connection alleged by his predecessors to obtain between the objects of causation. Accidentally conjoined events, by contrast, instantiate no law, and it is in their failure to do so that their accidentalness consists. If there are true contingent statements that are universal in form and that describe a uniform relation of *accidental* conjunction, then it may seem that Hume's specifications on the laws distinguishing causal from accidental sequences are inadequate, and thus that his theory of causation is seriously deficient. If in addition laws governing causal connections could be shown to reflect a non-psychological necessity—some sort of necessity in the objects of causation—then Hume's entire program would be undermined.

The attempt to find a non-Humean necessity either in general laws or in the causal sequences that instantiate them has recently focused on the relation between singular causal statements, laws, and counterfactual statements about the objects mentioned in the singular statements. The relevance of singular counterfactual statements to singular indicative causal statements hinges on the virtually universal conviction that a singular sequence of particular events, *c* and *e*, is a causal sequence only if there is some sense in which, if *c* had not occurred, *e* also would not have occurred. The sequence *c, e* is merely accidental, if, in this same sense, had *c* not occurred, *e* nevertheless might have. The relevance of singular counterfactual statements to laws rests