COUNTERFACTUALS AND CAUSAL LAWS

J. L. MACKIE

At the end of a recent article[1] Nicholas Rescher expresses the rash hope that the logical problem of contrary-to-fact conditionals may be allowed to rest in peace. But in saying that ' nomological ' or ' law-governed ' counterfactuals still ' generate real problems for the proper understanding of the concept of a law ' he gives us an excuse for exhuming the logical problem too. For, as I shall argue, a more adequate account of the meaning and use of counterfactuals in general will resolve also the problems they raise for the concept of a law.

The most acute problems, I believe, are these. A law-governed counterfactual seems to be a non-logical, synthetic truth about an unrealized possibility, and therefore seems to extend the scope of a law beyond the actual facts. Also it seems that ' generalizations of fact ' or ' accidental ' universal propositions do not sustain counterfactuals in the way that causal laws do, so that causal laws must be something more than statements of actual universal sequence or concomitance.[2] If it just happens to be the case that everyone in this room understands English, it does not follow that if Mr. Khrushchev had been here he would have understood English, but if there is a causal law which connects being in this room with the understanding of English then this counterfactual conditional does follow. This seems to point to a distinction between what is asserted by a law-statement and by an ' accidental' universal of the form 'All A's happen, as a matter of fact, to be B's ', which would compel us to reject a Humean or regularity theory of causation and admit that causal laws involve 'connections ' not reducible to concomitances and sequences. But such ' connections ' would constitute a difficulty for empiricism: how could we discover them, and what would they even *be*—for it will

[1] ' Belief-contravening Suppositions ', *Philosophical Review*, LXX (1961), pp. 176–196.

[2] Cf. William Kneale, *Probability and Induction*, pp. 74–75, and ' Natural laws and contrary-to-fact conditionals ', *Analysis*, X (1950), reprinted in *Philosophy and Analysis*, ed. M. Macdonald; also ' Universality and Necessity ', *British Journal for the Philosophy of Science*, XII (1961), pp. 89–102.

not do to define a connection simply as *that which* sustains a counterfactual?

I shall try to show that these problems can be solved within the framework of a regularity theory, and indeed that the very same interpretation of counterfactuals solves both them and the much-discussed logical problems which Rescher claims to have laid to rest.

I. *General account of the meaning and use of counterfactuals*

A counterfactual such as ' If he had come he would have enjoyed himself ' does two things: it has a conditional element and it asserts or hints that he did not come. It is of the conditional element that an account is needed, for clearly it does not state an entailment or strict implication, and yet there is in it something more than the material conditional (of the form $P \supset Q$) which is equivalent to ' Either he did not come or he enjoyed himself '. But an open conditional, such as ' If he came he enjoyed himself ', may likewise say more than the material conditional. Indeed its conditional element is just like the conditional element in the counterfactual: an open conditional is just like a counterfactual without the asserted or hinted denial of the antecedent. And similarly what Goodman has called a factual conditional, such as ' Since he came he enjoyed himself ', has still the same conditional element but also asserts or hints that the antecedent (and therefore the consequent also) is true. These three forms differ, then, only in what they say or suggest about the truth or falsity of the antecedent: in all there is also a conditional element, which makes some connection, over and above material implication, between the antecedent and the consequent, and it is of this that an account is needed. I shall offer an account of this element in counterfactuals, but it will be applicable with only minor modifications to other non-material conditionals as well.

Prima facie, a counterfactual seems to describe an imaginary situation, and to say or hint that it is imaginary. Consider ' If you had had the brakes fixed, there would not have been a collision '. A situation which, it is admitted, has not come about, namely the brakes having been fixed, is further characterized by the absence of a collision. But this description is not a purely imaginative exercise; we imagine the brakes having been fixed but say that the absence of collision follows from this or goes with this non-

imaginatively. How can we describe non-imaginatively an imaginary situation? Only by inference from something else that we know or believe. And yet to state a counterfactual is not to give an inference in full: we do not give all the premisses and intermediate steps. A counterfactual conditional, then, is a condensed and incomplete argument.[1]

For example, if we expanded the one about the brakes we might get something like this: ' Suppose that you have had the brakes fixed. Then when the other car turns across your path you press the brake pedal. So your car stops quickly. So there is no collision.' Though expanded, this is still incomplete: to complete it we should have to add further premisses describing the situation and laws connecting properly adjusted brakes with stopping, and stopping, in certain circumstances, with the absence of collision.

Something like this would be the ground on which one would advance this counterfactual. But we can understand it without being able to complete the argument: we can understand a counterfactual without knowing its grounds. It is therefore more like this incomplete argument: ' Suppose that you have had the brakes fixed. Then (in view of certain unspecified true propositions) there is no collision.'

But to advance the counterfactual is not to say that there is such an argument available; it is not to say, ' There are true premisses from which together with the premiss " You have had the brakes fixed " the conclusion " There is no collision " follows.' To advance the counterfactual is not to assert any proposition, even one about an argument; it is rather to run through a condensation of an argument. We can do this without being able to specify explicitly the other premisses and intermediate steps on which we are relying; we jump from the supposition to the conclusion in the light of knowledge and beliefs that we need not and commonly do not make explicit. Similarly we can understand as a condensed argument a counterfactual advanced by someone else, without being able to complete either his argument or one of

[1]An interpretation of conditionals as arguments is given (in another context) by John Anderson in ' Hypotheticals ', *Australasian Journal of Philosophy*, XXX (1952), pp. 1–16. An interpretation of counterfactuals as incomplete arguments is developed by R. S. Walters in ' The Problem of Counterfactuals ', *Australasian Journal of Philosophy*, XXXIX (1961), pp. 30–46. My own account arises partly from discussion of an early draft of Walters's article, and I agree with much, but not all, of what he says.

our own. In either case the argument is not argued, but rather entertained: not all the premisses are asserted, nor is the conclusion. One premiss is merely supposed, and the argument from it to the conclusion lies within the scope of this supposition.

Since the argument is thus condensed or telescoped, there is inevitably some indeterminacy about the way in which it would be completed. Other premisses would have to be drawn from our other knowledge and beliefs, and, as Rescher has correctly stressed, the introduction of the belief-contravening supposition will compel us to reject some further beliefs if we retain others, but does not in itself determine which of the others are to be retained and which therefore rejected.

If we interpret counterfactuals, and other non-material conditionals, as arguments, we cannot say that they are true or false or that they are implied by other statements. But we can say that a non-material conditional is *sustained* by the premiss or premisses which, with the antecedent as a further premiss, entail the consequent of that conditional. Thus 'All defeated presidential candidates are disappointed ' and ' Kennedy was a presidential candidate ' together sustain but do not imply ' If Kennedy had been defeated he would have been disappointed ' and similar pairs of statements sustain the open conditional (usable in October, 1960) ' If Kennedy is defeated he will be disappointed ' and the factual conditional ' Since Nixon was defeated he was disappointed.' It is true that if certain premisses, together with a supposition P, entail a conclusion Q, then these premisses alone entail the material conditional $P \supset Q$. So wherever true premisses validly sustain a non-material conditional, the corresponding material conditional is true. But the non-material conditional corresponds not to the conclusion $P \supset Q$ but rather to the whole argument within the scope of the supposition, from which we infer $P \supset Q$ by the principle of conditional proof.

By treating counterfactuals as telescoped arguments we avoid the difficulties encountered by those who have tried to reduce them to statements of some other sort, and in particular to give a truth-functional analysis of them.[1] But we should expect that a statement (or consistent set of statements) of any sort could sustain a non-material conditional, since it could be the additional

[1] *E.g.*, Roderick M. Chisholm, *Mind*, LV (1946), pp. 289–307, and F. L. Will, *Mind*, LVI (1947), pp. 236–249.

premiss (or set of premisses) which, with the antecedent, entails the consequent. And then if the sustaining statement (or statements) were true, the sustained conditional would be acceptable in the way in which an entertained argument is when its conclusion follows validly from premisses of which one is the supposition and the others are true. But while this holds for open and for factual conditionals, it seems not to hold in all cases for counterfactuals: the problem from which we started was that accidental universals do not sustain these, and there are also other awkward cases. Since on this interpretation there is no question of counterfactuals being true or false we avoid the problem of finding adequate criteria for their truth[1]; but we are left with the two other problems of explaining in what circumstances we are prepared to advance a counterfactual and of saying when and why we are justified in doing so.

Now, as Rescher has stressed, a ' belief-contravening supposition ' always confronts us with the task of choosing which of our existing beliefs to retain in combination with it and which to reject, and this indicates a general solution of the above-stated problems: we use a counterfactual if and only if we are justified in thus sticking to the belief (or set of beliefs) that would sustain it. I shall show, in II below, how this principle explains the different bearing of causal laws and ' accidental ' universals on counterfactuals, and, in III below, how the same principle resolves other well-known difficulties.

II. *Laws and ' accidental ' generalizations*

If we ask, ' Why is it that causal laws sustain counterfactuals whereas generalizations of fact do not? ' we are formulating the puzzle in a misleading way. We are suggesting that we must look for some special virtue in causal laws, over and above universality, that enables them to sustain counterfactuals, mysterious truths that go beyond the actual world. My contention is that counterfactuals are not truths but condensed arguments, that so interpreted they cease to be mysterious, and that the premisses that sustain them are just ordinary propositions, which may or may not be universals. The real puzzle is, ' Why do some generalizations of fact, particularly those that are called " accidental " generalizations, fail to sustain counterfactuals which a corresponding causal law would sustain? ' The problem is not to find any extra virtue in causal laws, but to find what special deficiency there is in ' accidental ' universals.

[1] Discussed, *e.g.*, by Nelson Goodman, *Fact, Fiction and Forecast* (London, 1954), pp. 14–31.

Once we ask the right question it is comparatively easy to find the answer. Let us take it that we have discovered by complete enumeration, by checking each individual in turn, that all persons in this room understand English. To use this to sustain the counterfactual, ' If Mr. Khrushchev were in this room he would understand English ' would be to add the supposition ' Mr. Khrushchev is in this room ' and to use it along with the enumeratively established universal to derive the conclusion ' Mr. Khrushchev understands English '. But since our sole ground for believing the universal was an enumerative check, that ground disappears as soon as we add the supposition that someone *else* is in the room; someone, that is, who is not in fact in the room and whose understanding of English has not been checked. The adding of the supposition so changes the situation that the previous evidence for the universal completely fails to support it in the new situation. If the universal were true and Mr. Khrushchev were in the room then he would understand English, but our ground for believing the universal, the person-by-person check, evaporates as soon as we add the supposition, so we cannot take this universal *as we know it* and this supposition as joint premisses in an argument. Because the supposition of Mr. Khrushchev's presence is contrary-to-fact, we have not checked the understanding of English of all the persons in the room in the supposed situation, and as the complete check was our only reason for believing the universal we are not justified in sticking to it when we add the supposition, and we are not in fact prepared to do so.

This account is confirmed if we contrast the counterfactual with an open conditional. The ' accidental ' generalization, ' Everyone in this room understands English ', does sustain the open conditional ' If Mr. Khrushchev is in this room he understands English '—that is, one of the persons present may be Mr. Khrushchev disguised or unrecognised, and if so he has passed the check on his understanding of English. This is acceptable because the open supposition that he is here does not undermine our belief in the universal, whereas the supposition that he is here, coupled with the admission that in fact he is not, does undermine

it. It is precisely the contrary-to-fact aspect of the antecedent that makes us unable to use it along with an enumeratively established universal.

This account can easily be extended to cover examples where the 'accidental' universal is known not by a complete enumeration but by some other, similar, process. If we know that none of the stones in this box is radioactive because a Geiger counter nearby shows no response, this universal does not sustain the counterfactual ' If that other stone were in this box it would not be radioactive ' because again the supposition that some *other* stone is in the box undermines the evidence of the Geiger counter as a reason for believing the universal along with the supposition.

On the other hand, a generalization sustains a counterfactual if our reason for adhering to it is not undermined when we add the supposition. This can come about in two ways, for these reasons may be either deductive or inductive ones.

Suppose it is known that all the pottery used at a certain period was unglazed. From this we can infer that all the pottery so far dug up in sites of that period is unglazed. The latter proposition, known thus by inference from the former, sustains the counterfactual that if some other site of that period had been excavated only unglazed pottery would have been found in it. And this holds even if the former proposition is itself only an ' accidental ' generalization; all that is essential is that it gives us a reason for adhering to the latter one which is not undermined when we add the contrary-to-fact supposition that a certain site of the period has been excavated—a site which has not in fact been excavated.

This is not, however, the only type of case. What is more interesting is that a causal law can sustain counterfactuals without being itself derivable from any wider generalization. This is the problem, for, it may be argued, if a causal law is a universal proposition that can be combined with a supposition that alters the extension of the subject term it must be something more than a generalization of fact. But I reply that the difference does not lie in the content of the proposition: it is not that a causal law asserts something of a different sort from what is asserted by any other universal. The difference lies first in the way we use them.[1] To

[1] Cf. A. J. Ayer, 'What is a Law of Nature?', *Revue Internationale de Philosophie*, 36 (1956), Fasc. 2.

use a proposition as a causal law is (i) to combine it with suppositions that go beyond cases for which the law has been checked, and so to advance open conditionals, and (ii) to combine it with suppositions that alter the extension of the subject term, and so to advance counterfactual conditionals. But secondly—and this is more important—the difference lies in the kinds of evidence we have. We are justified in using a universal as a causal law if we have good inductive evidence for it, so that our reasons for believing it are not impaired when it is combined with a supposition of kind (i) or (ii). We are also, of course, justified in thus using a universal that is derived from other causal laws, but only because they in turn are supported by good inductive evidence.

It may now be objected that I have shifted the problem to the realm of induction: to explain why a causal law sustains counterfactuals is to explain how there can be evidence for a universal proposition which is not impaired either (i) by a supposition that there is an instance of the subject term which has not been included in the evidence, or (ii) by a supposition which adds further (contrary-to-fact) instances of the subject term. To this charge I plead guilty: indeed what I claim to have shown is that the problem of the sustaining of counterfactuals by causal laws is nothing more than the general problem of induction. It is not my purpose to discuss this problem. If we can take it that there are good inductive reasons, that we can have evidence for generalizations which the supposition of further instances does not undermine in the way in which it undermines evidence which consists in a complete enumeration or anything of the same sort, then we have explained how causal laws differ from ' accidental ' universals in their ability to sustain counterfactuals without assuming that a causal law, in its content, is anything more than a simple universal.

If we have inductive evidence for 'All A are B ', then this evidence supports the conclusion that an unobserved A is B, and thus it justifies the argument from the supposition that X is A to the conclusion that X is B, and the open conditional which is a condensation of that argument. But this evidence is logically related in exactly the same way to the argument from the supposition that Y is A to the conclusion that Y is B, even if we know that Y is not in fact A, and that is why it justifies the counterfactual which is a condensation of this argument. Formally all that is required to let a law sustain counterfactuals is that there should

be the same logical relation (i) between the evidence and the proposed law (covering unobserved instances) as things are, and (ii) between the evidence and the proposed law with things otherwise the same but with additional instances of the subject term. And this holds for all ordinary inductive reasoning.

III. *Implausible and competing counterfactuals*

The principle I have used to explain why ' accidental ' generalizations fail to sustain certain counterfactuals will also explain why, among other counterfactuals, some are acceptable and others are not. Initially we might expect that the counterfactual ' If A then C ' would be acceptable wherever a statement (or set of statements) S was true (or believed to be true) and A and S would together entail C.[1] But some statements are not acceptable for the rôle of S, or are not acceptable in all circumstances, and some are more acceptable than others. It is my task to explain these differences, though this does not call for such hard and fast restrictions as would be needed if we wanted to call some counterfactuals true and others false.

If A is a contrary-to-fact supposition, then $\sim A$ is true, and the conjunction $A.\sim A$ entails any conclusion at all. Any counterfactual whatever would be justifiable on these grounds, and to avoid this trivialization we must not admit $\sim A$ as an acceptable sustaining statement for the counterfactual ' If A then C ', and indeed we do not so use it. Our principle explains why this is so: since $\sim A$ is the denial of the supposition A, we are not prepared to stick to $\sim A$ when we introduce that supposition. Similarly, since $\sim A$ is true, $\sim A \vee C$ is also true, whatever C may be, and A together with $\sim A \vee C$ entails C. But we do not advance the counterfactual ' If A then C ' on these grounds, for if our only reason for believing $\sim A \vee C$ is that we believe $\sim A$, we have no reason for sticking to $\sim A \vee C$ when we add the supposition A.

The competing counterfactuals ' If Bizet and Verdi had been compatriots, Bizet would have been Italian ' and ' If Bizet and Verdi had been compatriots, Verdi would have been French ' can be expanded respectively into these arguments:

'Verdi is Italian; suppose that Bizet and Verdi are compatriots; then Bizet is Italian.'

[1] Cf. Goodman, op. cit., pp. 14–31.

' Bizet is French; suppose that Bizet and Verdi are compatriots; then Verdi is French.'

Each of these by itself is unexceptionable. Each combines a true premiss with a contingent supposition and draws a conclusion which follows validly from them (given certain linguistic rules about the term ' compatriots ' and nationality-descriptions such as ' French ' and ' Italian '). But the three premisses ' Verdi is Italian ', ' Bizet is French ', and ' Bizet and Verdi are compatriots ' form, in the light of the linguistic rules, an inconsistent triad. Any two are compatible, so any two can be used in the same argument, but all three cannot be used together except in a *reductio ad absurdum*, and so we cannot use together, as direct arguments, the two arguments that need them as premisses. Corresponding comments apply to the counterfactuals that are condensations of the two arguments. There is a use for each of them separately, where we are prepared to stick to one or other of the nationality-statements along with the supposition, but there is no direct use for the combination of them into ' If Bizet and Verdi had been compatriots Bizet would have been Italian and Verdi would have been French ', because we cannot stick to both the nationality-statements along with the supposition. Since a counterfactual is not true or false, the competition between these two is no problem. Of any two competing counterfactuals we shall advance the one which is sustained by those of our other beliefs which in the actual context we are prepared to stick to when we add the supposition. In cases of the Bizet-Verdi sort, we would normally have no more reason for sticking to one rather than the other of the two beliefs when we add the supposition that brings them into conflict, and so we would not normally use either of the competing counterfactuals in such a case as this.

There is a similar formal pattern even where one of the relevant beliefs is or incorporates a causal law. The statements ' Cyanide is a deadly poison ', ' Jones is alive ', and ' Jones took cyanide ' form an inconsistent triad, and the first and second of these would sustain, respectively, the competing counterfactuals ' If Jones had taken cyanide he would not be alive ' and ' If Jones had taken cyanide, cyanide would not have been a deadly poison '. But these are not on level terms, as were the rivals in the Bizet-Verdi example. We are much more prepared to stick to the law that

cyanide is a deadly poison than to the particular fact that Jones is alive. But it is not that the former generalization is ' so secure that we are willing to retain it at all costs, and to let all else revolve about it when a belief-contravening supposition is made '.[1] The point is that if it is definitely conceded that Jones did not take cyanide, then the supposition that he did take it so changes the situation that we have little reason to adhere, along with it, to the statement that Jones is alive. This is not because the law is secure, but merely because a situation containing a different temporal antecedent is a different situation, about which the observation that Jones is alive in the actual situation fails to inform us. It is not that we know the causal law about cyanide, but merely that we know there are causal laws, that a difference in a temporal antecedent is often followed by a different outcome. That this is the point is confirmed by the fact that the *open* conditional ' If Jones took cyanide, cyanide is not a deadly poison ' is quite natural and plausible. This is so because we can quite well combine the fact that Jones is alive with the supposition, considered as an open possibility, that he took cyanide, and use these as joint premisses in an argument. The corresponding counterfactual is not plausible because the contrary-to-fact supposition, just because it is contrary-to-fact, does away with our reason for adhering, along with it, to the statement ' Jones is alive '.

Similarly, if we have these five beliefs:[2]

(1) All dry matches located in an oxygen-containing medium light when struck.

(2) M is a dry match.

(3) M is located in an oxygen-containing medium.

(4) M has not been struck.

(5) M has not lit.

then when we introduce the supposition that denies (4) we must reject at least one of the others, so that there are four formally possible counterfactuals:

(*a*) If the match M had been struck, it would have lit.

(*b*) If the match M had been struck, it would not have been dry.

[1] As Rescher says (p. 198) of a similar case.
[2] Cf. Rescher's Example 13.

(*c*) If the match M had been struck, it would not have been located in an oxygen-containing medium.

(*d*) If the match M had been struck, it would not have been the case that all dry matches located in an oxygen-containing medium light when struck.

Of these, (*a*) is the most plausible, because, as in the cyanide example, the denial of (4) so changes the situation that we lose the ground we had for adhering to (5). But if we exclude (*a*) by making the antecedent ' If the match M had been struck but not lit ', there is then no general reason for preferring one rather than any other of the consequents of (*b*), (*c*), and (*d*), and which of the three counterfactuals we actually use on any occasion will depend on which of the beliefs (1), (2) and (3) we choose to retain. It is true that all of these are somewhat odd in another way. Counterfactuals are most naturally used to describe an imaginary course of events, where the antecedent of the conditional corresponds to a causal antecedent and the consequent to an effect, and of the four counterfactuals listed above only (*a*) conforms to this pattern. But this is only the most natural use, not the only possible one.

Goodman, in his search for adequate criteria for the truth of counterfactuals, has to introduce one restriction after another on the set S of statements that sustains the counterfactual, and it is in order to exclude such examples as (*b*) above that he finally lays it down[1] that S must be not merely compatible but ' cotenable ' with the antecedent A. Since cotenability depends on causal relations this criterion is circular, and involves Goodman in the ' really serious ' difficulty that we cannot determine whether S is cotenable with A without determining whether another counterfactual is true. Thus he faces the infinite regress that ' to establish any counterfactual . . . we first have to determine the truth of another '.[2] But, as we have seen, once we reject the question of truth and confine ourselves to the tasks of explaining in what circumstances we are either prepared to use or justified in using a counterfactual we need not exclude absolutely such examples as (*b*), and we can explain our normal reluctance to use them without introducing the circular criterion of cotenability.

An argument from a supposition can be used either directly or indirectly. That is, we may use it *either* to say what would really

[1] Op. cit., p. 21.
[2] Op. cit., p. 23.

happen (or have happened) if the supposition were (or had been) fulfilled, *or* to show that the supposition is false or in some sense impossible. There are two corresponding ways of using the open or counterfactual conditionals which are condensations of such arguments, and counterfactuals which conflict with one another in their direct use may be compatible when used indirectly. Thus although the competing counterfactuals about Bizet and Verdi cannot be used together directly, to say what would have been the case if the two really had been compatriots, they can be used together indirectly to show that in view of our other knowledge they could not have been compatriots. Similarly, two ' law-governed ' counterfactuals can be used together to show that their common supposition is causally impossible: ' If there were a perpetual motion machine it would dissipate energy ' and ' If there were a perpetual motion machine it would not dissipate energy ' can be used together by someone arguing that there could not be a perpetual motion machine.

IV. *Conclusion*

It may seem strange to say that non-material conditionals are condensed arguments, when on the face of it they are single statements. But what matters is not what they look like but how they work, and what kinds of logical commendation and disparagement are appropriate to them. We have seen that such conditionals, and especially counterfactuals, work like arguments, and that whereas we get into difficulties if we try to characterize them as true or false we avoid these difficulties by discussing the circumstances in which the corresponding arguments can be used. Some of the difficulties would be met by saying that counterfactuals are ambiguous statements, but it seems impossible to say satisfactorily what straightforward statements a counterfactual is ambiguous between. We could perhaps say that non-material conditionals are just a special sort of statement, that they are not reducible to any other sort of statement and work not like other statements but like arguments; but if this much is conceded it is only a verbal issue whether we say that they are arguments or not.

It may be objected that the distinction between accidental and causal generalizations is a distinction between two sorts of thing that can be asserted, and not merely one between two ways of using and two ways of supporting what we assert. Granted that a

certain generalization is true, there seems to be a real and objective issue whether it is causally true or only accidentally true. Without going back on what I have argued, I would admit that there are two sorts of objective issue that can be raised in these terms.

First, we can ask whether a universal is only accidentally true with implicit reference to some wider generalization. If it is true that all the pottery so far dug up in sites of a certain period is unglazed, we may say that this is accidentally true if not all the pottery used in that period was unglazed, but not only accidentally true if all the pottery used in that period was unglazed. In this sense an accidental generalization is simply one that is unrepresentative of a larger class of which we are implicitly taking it as a sample. In this sense it is an objective issue whether a generalization is accidental or not as soon as we have fixed the larger class with implicit reference to which the issue is raised.

Secondly, certain causal laws are sometimes distinguished from other universals in the following way.[1] Suppose that there were a closed deterministic system which we knew all about; then we could distinguish its fundamental laws of working from statements, even universal statements, of the collocations of things and properties at various times. This would not be a simple formal distinction, for collocation-statements might be put into a purely qualitative form. Nor would it coincide with our ordinary distinction of laws from mere facts, for statements which we should initially regard as causal laws might turn out to be derived from the conjunction of more fundamental laws with collocations. The distinction of which I am speaking could be made finally only in relation to complete knowledge of the system and of the relations among the true propositions that described it. Though not easily drawn, it would constitute an objective distinction between laws of working and collocations, and this is a possible sense in which the question whether a generalization is accidental or not could raise an objective issue: a non-accidental universal would be, in any system, a law of working which did not depend upon collocations. This distinction can in principle be drawn; but it does not mean that the laws of working are any more necessary, in any way logically stronger, than the collocation

[1] Cf. H. Gavin Alexander, ' General Statements as Rules of Inference? ' in *Minnesota Studies in the Philosophy of Science*, Vol. II (1958), pp. 309–329, esp. p. 327.

statements: these laws would be distinguished only negatively, by their freedom from any element of or dependence on collocation, not by any positive feature over and above their being true universal propositions.

I shall not pursue this question further, because it is not my purpose to attempt a full account of the nature of causal laws. All I have tried to do is to resolve those problems about the concept of a law which are raised by counterfactual conditionals. I claim that if we interpret such conditionals as condensed arguments we can both explain why some counterfactuals are acceptable while others are not and at the same time show that the supposed counterfactual core of causal statements, their applicability to unrealized possibilities, is nothing more than their being supported by inductive evidence and used accordingly. A proper analysis not only resolves the logical problem of counterfactuals but also reduces the problems raised by law-governed counterfactuals to the general problem of induction.

PROPOSITIONS

R. CARTWRIGHT

1. WHAT is it that is susceptible of truth or falsity? In spite of the attention given to it, this question can hardly be said to have been settled. The answers suggested constitute a bewildering variety: sentences, utterances, ideas, beliefs, judgments, propositions, statements—each has had its advocates. Perhaps variation in terminology explains some of the apparent disagreement, but it does not explain it all. And the current fashion among logicians of taking sentences to be the bearers of truth and falsity indicates less an agreement on philosophical theory than a desire for rigour and smoothness in calculative practice. Thus there is ample reason for re-opening the issue.

2. Treatments of the question often proceed upon one or the other of two assumptions. Some assume that there is just one kind of thing susceptible of truth or falsity, that truths and falsehoods together comprise a single type or category of things; and accordingly we are sometimes told that it is *only* judgments or *only* utterances or *only* propositions that are, properly speaking, true or false. Others assume that there is some one category of things that are, in some sense, the 'ultimate' or 'primary' subjects of ascriptions of truth and falsity and that anything else which is true or false is so only 'derivatively' or 'secondarily'. Thus we are sometimes told that although beliefs and sentences may with propriety be said to be true (or false), their truth or falsity is 'derivative from' that of something else—propositions, perhaps, or statements; and to this it is added that only these latter are true 'in the primary way'. Perhaps it is unfair to speak of either of these as assumptions rather than as reasoned conclusions. The point need not be debated here. For I mention them only for the purpose of explaining that they are not presupposed by the question I wish to discuss. This explanation may be unnecessary in the case of the second; for perhaps we should not naturally take the question, 'What is it that is susceptible of truth or falsity?' to presuppose that things of some one kind are 'ultimately' true (or false). But the question is so worded that it might