Space, Time and Causality, Lectures 9 & 10:  
Causation: Regularity Accounts

Overview and Intended Outcomes:  
By the end of this week’s work you’ll be able to:
— explain the idea of providing a reductive account of causation and the motivation for the project of providing such an account 
— explain Hume’s regularity account of causation 
— explain necessary condition accounts and sufficient condition accounts 
— explain Mackie’s INUS condition account 
— explain some of the objections which can be raised against these accounts 
— evaluate the theories under consideration, and argue for your views

Causation

Causation appears to be a pervasive structuring phenomenon in the concrete world. Hume called it “the cement of the universe”. Causal connections are of importance to us, as it seems that we manipulate the world by using them: we make things happen by doing other things which cause them. Further, our everyday thought and talk are peppered with references to causation, and causation is implicated in a wide range of philosophical issues. For instance, there are causal accounts of action and responsibility. Some philosophers argue that to perceive something is at least in part to have an experience caused by that thing. Others say that memory needs to be understood in terms of causation. Still others say that reference (a name ‘standing for’ an object) needs to be understood in causal terms. And in this module we’ve seen that causation is implicated in discussions about time (in relation to such questions as What distinguishes time from other dimensions? What determines the ‘direction’ of time? Can there be time without change?), and in discussions about space (Can acceleration relative to the fixed stars provide a plausible causal explanation of inertial effects?). There seems to be ample motivation to look at the nature of causation.

The Area of Investigation

We’re going to focus on what’s called ‘singular causation’ — where one particular thing causes another. Examples:

The impact caused the fracture
Don’s fall caused his (Don’s) death
The short-circuit in the basement caused the fire in the Gaumont Hotel

We won’t be looking at causal relations between types (‘Smoking causes cancer’). The key question we’ll be addressing is: When is one particular thing the (or a) cause of another?
A Preliminary: ‘Analysis’

Analysis is one way of giving the content of a concept. In analysis we state necessary and sufficient conditions for the concept to apply (truly) to some thing or things.

**Necessary Conditions:** \( x \) is a ewe only if \( x \) is a sheep
(Being a sheep is a necessary condition of being a ewe. To be a ewe, a thing must be a sheep.)

Note that a statement giving a necessary condition for being a so-and-so leaves it open that there is more to being a so-and-so than satisfying the stated condition.

**Sufficient Conditions:** \( x \) is a ewe if \( x \) is female and \( x \) is a sheep
(If something is female and a sheep, then that’s sufficient to make it a ewe.)

Note that a statement giving one sufficient condition for being a so-and-so (specifying one way of being a so-and-so), leaves it open that there are other sufficient conditions for being a so-and-so (other ways to be a so-and-so).

Necessary and sufficient conditions: \( x \) is a ewe if and only if \( x \) is female and \( x \) is a sheep
This is an analysis of the concept of being a ewe. Intuitively, it says what all and only ewes have that makes them ewes.

**Note:** ‘if and only if’ is often abbreviated as ‘iff’ in philosophical texts.

**Reductive Analysis**

An analysis is reductive if the necessary and sufficient conditions given don’t mention the analysed concept. Thus, ‘\( x \) causes \( y \) iff \( x \) causes \( y \)’ is (obviously) not a reductive analysis of causation. Notice also that it’s plausible that ‘\( x \) causes \( y \) iff \( x \) produces \( y \)’ is not reductive either, because the concept of production seems to have content too closely related to the concept of causation.

Why Try to Give a Reductive Analysis of Causation?

One source of motivation for trying to provide a reductive analysis of causation arises as follows. We take ourselves to have a good deal of causal knowledge. But it’s arguable that:

- We don’t see (or otherwise have experience of) causal connections
  (All we see is one thing after another)
- Causal connections aren’t knowable a priori (independently of experience)
  —can’t be identified just by reflection
  —need to be found by investigation

So it seems that if there are facts about causation they cannot be basic (at least not if we are to be able to have knowledge of them): they must be facts which are determined by other facts.
Hume’s Account

‘We may define a cause to be one object followed by another, and where all the objects, similar to the first, are followed by objects similar to the second.’

*Enquiry*, Section VII

Hume’s account posits three necessary conditions:

1) **Contiguity** Causes and effects are connected in space and time
2) **Succession** Causes come before effects in time
3) **Constant Conjunction**
   
   \[ x \text{ causes } y \text{ only if } (x \text{ is } A \text{ and } y \text{ is } B \text{ and every } A \text{ is followed by a } B) \]

‘Necessary Connection’

Hume rejects one notion which *seems* to be a component of our ordinary notion of causation. It’s tempting to say things like: ‘If \( b \) causes \( c \), then \( b \text{ made } c \text{ happen} \)’, ‘Given that \( b \) happened, \( c \text{ had to happen} \)’, ‘Given that \( b \) happened, it was *necessary* that \( c \) happened’. These claims seem to give voice to the idea that causation involves some form of necessity: of the occurrence of the cause *forcing or necessitating* the occurrence of the effect, so that some sense the cause event could not happen without the effect occurring also. Hume thinks this ‘rich’ reading of these claims is ruled out. He thinks we should *not* include the idea of necessary connection in our account of causation.

— We don’t *observe* necessary connections (nor could we, since if they did exist they would concern what would be the case in non-actual circumstances)
— Causal necessary connections could not be known a priori (since there’s no contradiction in supposing that a particular cause event occurs and the corresponding effect does not)
— There are no necessary connections between distinct existences

This last is a metaphysical principle. It has a degree of plausibility. After all, if two things are really distinct—really different things—then surely one *could* exist without the other?

(Questions: Why does this claim seem plausible? If you believe it, can you say why you are inclined to believe it? Did you think about or imagine anything, for instance, when trying to decide whether it was true? If there was a process here, is it one that Hume endorses generally as a way of determining the answer to metaphysical questions?)

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1 Adherence to this principle is frequently attributed to Hume (e.g. by Tooley). Interestingly, Hume does not seem to deploy it often. Notice that it is a *metaphysical* principle—concerning the things themselves. Hume more often speaks in *epistemological* terms, talking about the possibility of *knowledge* of necessary connections. At least at one point, however, he does appeal to the metaphysical principle—in *Treatise* Volume I, Book 1, Part III, Section III, arguing against the idea that every event has a cause, he says: “The separation, therefore, of the idea of a cause from that of a beginning of existence, is plainly possible for the imagination; and consequently the actual separation of these objects is so far possible.”
‘No Necessary Connections’ and Regularities
Hume’s ban on necessary connections in nature has consequences for how he can understand generalizations like ‘Every A is followed by a B’.

‘Every A is followed by a B’ will be true when, as a matter of actual fact, every A is followed by a B.

Problems for Hume: Contiguity
Can’t cause and effect be separated in space and time, with an assassination in the Balkans, for instance, causing a war in Belgium?

Possible response: Yes, but via a chain of intervening causes and effects.

Follow-Up: But is contiguity really required for causal connection? Example: Newton’s theory of gravitation posits instantaneous action-at-a-distance with no intervening causes and effects. (So, if a theory was sufficiently impressive, in terms of explaining many things, being (relatively) simple, having a (relatively) small ontology, and so on, but seemed to posit action-at-a-distance, mightn’t we be prepared to allow that there really was such action?)

Problems for Hume: Succession
Can there really be no future-to-past causation? For instance, couldn’t it be that the flick of a switch in 2009 causes the arrival of a time machine in 1881? (Time-travel seems to be logically possible. That is, there isn’t any obvious contradiction in the idea of it. If that’s right, since time travel would involve back-over causation, it would seem back-over causation will be logically possible too, if there’s no independent argument for the impossibility of back-over causation.)

Another problem with the succession condition is that if we build time-order into the concept of causation, then we can’t give a reductive account of the direction of time in terms of causation.

Problems for Hume: Constant Conjunction
If we drop the contiguity and succession conditions, we are left with a plausible-seeming core—the constant conjunction condition. [We can get rid of the ‘followed by’ in the account of constant conjunction by saying instead: x causes y only if (x is A and y is B and every A is related in way R to a B). The idea can be made into an analysis of causation by substituting ‘iff’ for ‘only if’ in this claim.]

But there are several problems with this.

—(1) Causation without Conjunction?
Hit pool ball, it goes into the pocket (and hitting it caused it to go down); but sometimes I hit a pool ball and it doesn’t go into the pocket.

Possible Response: Be more precise about the facts—the hitting was of a particular type.
—(2) *The ‘Problem of Grain’*
But *how* fine-grained are our descriptions of events to be?
Too coarse-grained and nothing causes anything (pool ball case)
Too *fine*-grained and there are *too many cases of causation*…

Suppose I’m scratching my nose in a particular way just before a car crash occurs on Heslington Road. If I adopt a way of describing the nose scratching which is fine-grained enough, then it will be true that

Every nose scratching just like this… [fine-grained specification inserted here] has been followed by a car crash just like that.

—(3) *Epiphenomenal Causes*

\[
\text{Pressure Drop } d \rightarrow \text{Barometer Fall } b \rightarrow \text{Rain Shower } r
\]

Time →

Suppose: Pressure drops like \(d\) cause barometer falls like \(b\), and also cause (a little later) rain showers like \(r\). Then: All barometer falls (like \(b\)) are followed by rain showers (like \(r\)).
In that case, Hume’s account says, erroneously, that \(b\) causes \(r\).

—(4) *Ruling Out Probabilistic Causation*

Hume’s account rules that there is only deterministic causation. It says that where \(b\) causes \(c\), *all* \(b\)-like events are followed by \(c\)-like events. There is no room for merely probabilistic causation, where a type of potential cause *may* be followed by a certain type of effect on certain occasions but not on others.

**Problem:** Modern physics seems to say that there is probabilistic causation.

—(5) *Non-Causal Regularities*

Day is regularly followed by night. But days do not cause nights.

—(6) *Cosmic Coincidences*

Suppose: (As things actually turn out) every time I will someone to be evicted on Big Brother, that person is evicted.
Then, by Hume’s account, my willings cause the evictions.
But we think that this could be *just* coincidence, with no causal connection.

(Note that there may be cases in which someone’s willings *do* cause evictions—this objection doesn’t depend on ruling out telepathy, or telekinesis, a priori. What seems to be objectionable about Hume’s account is that it counts *all* regularities as causal.)
Interim Summary

- What is it for one thing to be the cause of another?
- Seems we need a reductive account to allow for causal knowledge

- **Regularity Theory:**
  \( b \) causes \( c \) iff every \( b \)-like event is followed by a \( c \)-like event

- **Problems:**
  Causation without conjunction?
  The ‘Problem of Grain’
  Epiphenomenal Causes
  Doesn’t allow Probabilistic Causation
  Counting Non-Causal Regularities as Causal
  ‘Cosmic Coincidences’

“Conditions” Accounts of Causation

We’ll look now at a slightly more sophisticated approach to causation than is provided by Hume’s simple regularity account. This kind of account makes use of the idea of causes as *conditions* of their effects: necessary conditions, sufficient conditions, necessary *and* sufficient conditions, or something yet-more complex.

**Necessary and sufficient conditions**

Roughly, we can think of necessary and sufficient conditions as follows:

- \( X \) is a *necessary condition* of \( Y \) iff ‘if \( Y \) then \( X \)’ is true.
- \( X \) is a *sufficient condition* of \( Y \) iff ‘if \( X \) then \( Y \)’ is true.

For the moment, we’re going to understand claims of the form “if \( X \) then \( Y \)” as depending only on the truth or falsity of \( X \) and \( Y \). We’ll say that the claim “if \( X \) then \( Y \)” is false when “\( X \)” is true and “\( Y \)” is false, and true otherwise. (“If/then” claims understood in this way are called “material conditionals”.) We can put this in the form of a table:

<table>
<thead>
<tr>
<th>( X )</th>
<th>( Y )</th>
<th>If ( X ) then ( Y )</th>
</tr>
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<tbody>
<tr>
<td>( T )</td>
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</tbody>
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Why Material Conditionals?

You might wonder why we should understand conditionals in this apparently counter-intuitive way. There are two points to note on this at this stage.

First, there is an argument for the claim that this account captures the logic of the indicative conditional. (Indicative conditionals like ‘If it is raining, then we will get wet’ as opposed to subjunctive conditionals like ‘If it were to rain, then we would get wet’.)

[Technical Note: Here’s the argument. (If you can’t follow it, don’t worry—this is a side issue. If you’re interested and want more help, see Ernest Lepore, Meaning and Argument, 2nd Edn, Blackwell 2003, Chapter 7, point 3, pp84-5, and the related appendix entries.) We’ll use the symbol ‘⊃’ for the material conditional. (Part 1) A claim of the form ‘If A, then B’ entails ‘A ⊃ B’. That is, if ‘If A, then B’ is true, then ‘A ⊃ B’ must be true. This is the case, because if ‘If A, then B’ is true, then it is ruled out that A and not-B, and that being ruled out is enough to make ‘A ⊃ B’ true (see the table above). (End of Part 1) Now, many people, however, think that ‘If A, then B’ is stronger than ‘A ⊃ B’, meaning that it takes more to make ‘If A, then B’ true, than does to make ‘A ⊃ B’ true. If this is right, then ‘A ⊃ B’ will not entail ‘If A, then B’, because it will be possible to have the first true without the second being true (because the additional requirements are not met). There is an argument against this claim, however. (Part 2) First, notice that ‘A ⊃ B’ is exactly equivalent to ‘not-A or B’: ‘A ⊃ B’ is true iff A is false or B is true (again, look at the table above to confirm this). Second, notice that if ‘C or D’ is true, then ‘If not-C, then D’ must be true. (This just seems obvious: if C is false, and ‘C or D’ is true, then D must be true.) But if we put ‘not-A’ for ‘C’ here, and ‘B’ for ‘D’, we see that if ‘not-A or B’ is true, then ‘If not-not-A, then B’ must be true; but this is just ‘If A, then B’. So, ‘A ⊃ B’ does entail ‘If A, then B’, after all. (End of Part 2) Since we’ve already agreed that ‘If A, then B’ entails ‘A ⊃ B’, this means that if one is true, so is the other: they have exactly the same truth-conditions.]

Second, remember that we are trying to give an account of causation which will solve the apparent epistemological problem concerning causation. Material conditionals can be determined true or false simply on the basis of what is actually the case. We’ll see that there are other forms of conditional, but that these are not obviously determinable as true or false on the basis of what is actually the case. Material conditionals seem more likely to allow us to deal with the epistemological problems we identified earlier.

Simple “Conditions” Accounts

Might we give an analysis of causation in terms of sufficiency, for instance? Suppose we say that C is a cause of E iff C and E are actual, and C is sufficient for E in the circumstances. In more detail, the idea is that

C is a cause of E iff
C and E are both actual, and
There is a condition D which is actual, and a law L, such that,
(C & D & L) entails E, &
(C & D) does not entail E, &
(D & L) does not entail E

[Reminder: X entails Y iff, if X is true, then Y must be true also.]
The last two clauses are intended to rule out spurious causes. The *penultimate* clause is intended to rule out spurious causes of the following kind. Suppose that David is standing on the grass, and that the grass is green. These two truths entail that David is standing on something green. Without the clause we’d have to say that David standing on the grass is a cause of David standing on something green. *The final clause* is intended to avoid counting all actual potential causes as causes of E.

A big problem for this proposal is that, if E has a cause, then every actual candidate cause satisfying an independence condition will be a cause of E. Here’s the proof:

Suppose C causes E, and allow (for the sake of argument) that the account is satisfied, so there’s a condition D and a law L such that C & D & L entail E, but neither (C & D) nor (D & L) does.

Consider a candidate cause X, which is actual and is such that (this is the independence condition)

\[ X \& [D \& (\text{if } X \text{ then } C)] \text{ does not entail } E, \text{ and } \]
\[ ([D \& (\text{if } X \text{ then } C)] \& L) \text{ does not entail } E \]

Since X, C and D are all actually the case,

(i) (X & [D & (if X then C)] & L) entails E
(ii) (X & [D & (if X then C)]) does not entail E
(iii) ([D & (if X then C)] & L) does not entail E

So, the proposal counts any actual X as a cause of E, no matter what X is. If the short circuit caused the fire, and I brushed my teeth for two minutes this morning, then—*according to this account*—my brushing my teeth for two minutes this morning caused the fire. (An analogous problem can be constructed for an account of cause in terms of necessity.) *And, even if these problems can be got round*—perhaps by ruling out conditional conditions—*there are other difficulties*:

**Problem for sufficiency accounts:** The length of a table’s legs is sufficient in the circumstances for the position of the top above the floor, so the length of the legs is a cause of the top’s position! One might start to get worried here, but even if one doesn’t, there’s a worse problem. The position of the top is sufficient in the circumstances for the length of the legs, but we strongly intuit that the position is not a cause of the length.

**Problems for necessity accounts:**

*Causal overdetermination* Suppose that a chemical reaction and a short circuit both act at the same time to produce a fire. Suppose that things are such that the chemical reaction would, on its own, have produced the fire. Likewise for the short circuit on its own. This is a case of *causal overdetermination*. Intuitively, the reaction and the short are both causes of the fire, but the proposed account says that neither is a cause, because neither is necessary in the circumstances. You might think (a) that causal overdetermination is astonishingly rare, so can be
ignored, and/or (b) that we’re really not sure what to say about what caused what in such cases, so they are not good test-cases for accounts of causation. But even if you do think one or both of these things, there is another, more pressing problem…

Preëmption Suppose that Tony sends Christopher to break Gino’s fingers with a wrench, but sends Pauli to watch Christopher, and break Gino’s fingers if Christopher loses his nerve. If Christopher doesn’t lose his nerve, then his bringing down the wrench (say) is a cause of Gino’s fingers getting broken, but that action isn’t necessary for the breakage in the circumstances (because if Christopher doesn’t do the job, Pauli will).

A General Problem for Simple Conditions Accounts
There is a problem which seems to undermine both simple necessary conditions accounts and simple sufficient conditions accounts: there seem to be causes which are neither necessary nor sufficient for their effects.

Consider an example of Mackie’s: suppose a short circuit (C) caused a fire (E). Is C a necessary condition of E? No, says Mackie, for there can easily be a fire without a short circuit: it could be caused by an arsonist, or a carelessly dropped cigarette, or... So ‘if E then C’ is false.

Is C a sufficient condition of E? No, says Mackie, for a short circuit occurring doesn’t by itself guarantee that a fire will start. There needs to be oxygen present, flammable material nearby, no working smoke detector to alert occupants of the house, and so on. So ‘if C then E’ is false too. Hence (*) will not do as an analysis of what it is for one thing to cause another.

Notice that this problem undermines accounts which say that x causes y iff x is a necessary and a sufficient condition of y.

Mackie’s INUS Conditions Account
Perhaps a more sophisticated conditional account is correct… Mackie proposed the following view. For A to be a cause of B, A must be at least an insufficient but necessary part of a condition which is itself unnecessary but sufficient. This way of expressing Mackie’s idea gives the common short-hand term for the view: causes are (at least) INUS conditions

Insufficient but Necessary parts of Unnecessary but Sufficient conditions

Very roughly, the view is that causes are components in complex circumstances which are sufficient for a particular effect. (For a neat summary of Mackie’s view, see section 1 of Kim 1965, reprinted in Sosa & Tooley and in your reading pack.)

In more detail, an INUS condition of an effect e is a condition which not sufficient (on its own) for e, but is, together with some other conditions, a component in a more complex condition which, though (perhaps) not necessary for e, is sufficient for e. Where a condition is a sufficient condition for e and contains no redundant sub-conditions we will call it a minimal sufficient condition for e. (A sub-condition is redundant where it could be dropped from the sufficient condition and the result still be sufficient for e; e.g. if B&C&D is sufficient for E, but C&D is also sufficient for E, then B is redundant and C&D is a minimal sufficient condition for E.)
Mackie says, in effect, that

- $x$ is a cause of $y$ iff
- $x$ and $y$ occur, &
- $x$ is at least an INUS condition in a minimal sufficient condition of $y$, &
- the other factors in that minimal sufficient condition of $y$ occur, &
- no other minimal sufficient condition of $y$ occurs

In the short-circuit case, the short (C) is a necessary component of a set of circumstances including: $G$ (the presence of oxygen); $H$ (the presence of combustible materials in the region of the short), not-$J$ (it not being the case that there is an effective sprinkler system in place). And these conditions are together sufficient for there being a fire. There may be sets of circumstances other than CGHnot-$J$ which would have sufficed for there being a fire ($E$).

The qualification that a cause must be at least an INUS condition arises because Mackie wants to allow

(i) that a cause may be part of a complex condition which is necessary (in addition to being sufficient) for the occurrence of the relevant effect;
(ii) that a cause may be on its own sufficient for the occurrence of the relevant effect;
(iii) that a cause may be on its own necessary and sufficient for the relevant effect.

Mackie’s analysis seems to work for the short circuit/fire case. But does it rule out candidates that are not in fact causes of the effect in question? Clearly if Mackie’s analysis is to be adequate, it must count only causes as causes. Take our fire, $E$, again; and consider the prior event $T$ of my brushing my teeth for two minutes. Let’s suppose that $T$ was totally unconnected with $E$. If Mackie’s analysis is to work, $T$ had better not be an INUS condition of $E$. Is it? Well, it seems that $T$ is not seen as a cause of $E$ by Mackie’s account. $T$ is an insufficient part of an unnecessary but sufficient condition of $E$ (i.e., TFGHnot-$J$). But $T$ is not a necessary part of that condition. For if we take $T$ away and you’re still left with a sufficient condition of $E$, namely FGHnot-$J$. So $T$ is not an INUS condition of $E$, so Mackie’s analysis seems to deliver the right answer: that $T$ is not a cause of $E$.

**A Problem for Mackie’s Analysis: Conditions and Events**

Mackie says, in effect, that

- $x$ is a cause of $y$ iff
- $x$ and $y$ occur, &
- $x$ is at least an INUS condition in a minimal sufficient condition of $y$, &
- the other factors in that minimal sufficient condition of $y$ occur, &
- no other minimal sufficient condition of $y$ occurs

And

- $x$ is an INUS condition of $y$ iff
- there is a condition $A$ such that $x$ and $A$ are sufficient for $y$, &
- neither $x$ nor $A$ alone are sufficient for $y$, &
- there are other conditions $B$ such that $B$ is sufficient for $y$
But now recall that this is meant to be an account of singular causation, so the things which are to stand as x and y are individual events. The problem is that individual events cannot stand as conditions. If we try to make them stand as conditions, the result does not seem to be intelligible:

If x and there is oxygen present and..., then y.
If this short-circuit and there is oxygen present and..., then this fire.

(The individual events are meant to be individual things, analogous to individual objects. The result is even more obviously absurd if we try to treat objects as conditions: If Tom, then David.)

It might be thought we could easily amend the account to cope with this. We might say

x is a cause of y iff
x and y occur, &
(the fact that) x occurs is at least an INUS condition of (the fact that) y occurs... (etc.)

There is, however, a further problem with this. If we understand the notions of necessary and sufficient conditions in terms of material conditionals, then the account is committed to every actual event causing every other.

Notice that for x to be a cause of anything, x must occur. (This seems to be an unavoidable requirement.) Similarly, for y to be a candidate effect, y must occur. But this means both of the following are true:

x occurs  y occurs

But now consider

If x occurs, then y occurs

Understood as a material conditional, this is going to be true in all cases in which x and y are actual events.

What happens if we try to press on and try to apply the account to the sorts of things Mackie takes to be conditions. These seem to be facts, rather than events: they correspond to sentences, such as ‘there is a short-circuit in the basement’, rather than noun-phrases, such as ‘the short-circuit in the basement’. If we allow ourselves to form names of conditions with conjunction (‘...and...’), disjunction (‘...or...’), and negation (‘It is not the case that...’), as seems to be required by Mackie’s account, then we run into trouble by again ending up committed to there being causal connections where we don’t think there are any. (Provided, of course, we understand the notions of necessary and sufficient conditions in terms of material conditionals.)

To see this, suppose that B and C are together sufficient for an effect E, so, as Mackie would put it, the condition BC is sufficient for E. Now a great many things will be counted as INUS conditions of E, including many things which we would strongly intuit not to be causes of E. Take any condition A. (In what follows, we’ll write ‘not-X’ as short for ‘It is not the case that X’.) If the condition (not-A or B)C is not sufficient for E (and there will be plenty of choices for A which make this so), then the condition A(not-A or B)C will be a minimal sufficient condition
for E, and so A will be an INUS condition for E. (At least, in those cases in which the condition (not-A or B) is not simply equivalent to the condition B; and there will be plenty of such cases.) (See Kim 1971, copied in your reading pack, for a detailed account of the difficulties here. See especially section 3.)

**Counterfactual Accounts of Necessary and Sufficient**

Mackie’s account includes a component which promises to get around the difficulties just noted. Mackie proposes understanding claims relating necessary and sufficient conditions in a way which does not read them as material conditionals.

Mackie first considers the possibility of treating them as generalizations (p. 47), so that ‘S is a necessary condition of T’ would be understood as ‘All T are S’. But he notes (p. 48) that this sort of treatment won’t work for claims relating to particular events: understanding claims like

> A short circuit here was a necessary condition of a fire in this house

as

> All cases of this house’s catching fire are cases of a short-circuit occurring here

would lead us to posit too many causal connections. If the house catches fire only once, there will be a huge number of claims of this sort, many relating to events not in any sense standing as causes of the fire. (This is just a variation on the problem-of-grain which arose for Hume’s account.)

Mackie proposes instead that we understand the relevant claims about necessary and sufficient conditions as being closely related to certain kinds of non-material conditionals (p. 48 in the reading pack excerpt). For instance

> A short-circuit here was a necessary condition of a fire in this house

is seen as being closely related to

> If a short-circuit had not occurred here, this house would not have caught fire

This is a *counterfactual* conditional. Claims like this are called counterfactual because they talk about how things *would* have been *had the facts been different than they are* (with the short-circuit not occurring, for instance).

This, of course, is not enough, in itself, to guarantee us a reductive account of causation. (For one thing, for all that’s been said so far, it may well be that what grounds the truth of the relevant counterfactual claims is that certain causal relations hold between events.) For a *reductive* account of causation, then, we’d need to see that a correct account of this sort of counterfactual conditional claim can be given which does not presuppose any unreduced causal claims.

Mackie proposes such an account. He says that such claims are *compressed arguments*. For instance

> If we said that a short-circuit here was a necessary condition for a fire in this house, we should be saying that there are true universal propositions from which, together with true statements about the characteristics of this house, and together with the supposition that a short-circuit did not occur here, it would follow that the house did not catch fire… (p. 49)
But now we need to know what *true universal propositions* might be. It seems clear that Mackie has in mind empirical generalizations. But this raises a familiar worry: if the generalizations in question are just reflections of regularities, then it seems that they will be apt to generate the kinds of problems we saw affecting simple regularity theories, concerning the problem of grain, epiphenomenal causes, ruling out probabilistic causation, non-causal regularities and cosmic coincidences.

Further, one might worry about making our account of causation depend on claims about what *would* have happened in certain non-actual circumstances. What right have we to suppose that things would have gone in such-and-such a way, had things not been as they actually are, in some particular way? (And again, even if we have such a right, might that not be grounded in certain *causal* facts, such as the fact that the short *caused* the fire?)

In next week’s lectures and seminars we’ll look at accounts of causation which attempt to give a reductive account of causation in terms of counterfactuals, dealing with the worries just raised concerning reduction.

**Advice on further reading:**
For an introduction to the topic see:

**References**


**S&T**: Ernest Sosa & Michael Tooley, eds: *Causation* (OUP, 1993).


Davidson, Donald, 1980: *Essays on Actions and Events* (OUP).

Hume, David: *A Treatise of Human Nature* (Book I, part III, esp. sections xiv and xv). (SP)

Hume, David, 1748: *An Enquiry Concerning Human Understanding* (section VII). (SP)


