From David Armstrong,
A Combinatorial
Theory of Possibility

The causal argument

1 Theories of Possibility

Every systematic philosophy must give some account of the nature of possibility. The main constraint I wish to place on such an account is that it be compatible with Naturalism. The term ‘Naturalism’ is often used rather vaguely, but I shall understand by it the doctrine that nothing at all exists except the single world of space and time. So my objective is to give an account of possibility which is in no way other-worldly.

A non-Naturalist theory of possibility tries to account for the notion by postulating entities additional to the world of space and time, for instance, possible worlds or ‘abstract’ propositions. It will be useful to begin by criticizing some non-Naturalist theories, concentrating especially on the account given by David Lewis.

Among the non-Naturalist theories of possibility there is one, not Lewis’s, which has a central place. This is because other theories can be seen as reactions to it. The theory is popularly attributed to Leibniz, although the textual warrant for this is dubious. But it is convenient to call it the Leibnizian view.

According to this view, over and above the actual world there are an indefinite multiplicity of merely possible worlds. They constitute all the ways that the world could have been. Included in the actual world are its past, its present and its future. The actual world contains minds, perhaps matter, perhaps God, perhaps still stranger things. The actual world is a possible world. The other possible worlds, the merely possible worlds, are ways that the actual world might have been.

A contingent truth is, then, defined as a truth true in the actual world but false in some possible world. A contingent falsehood is false in the actual world but true in some possible world. A necessary truth is true in all possible worlds; a necessary falsehood is false in all possible worlds.

Contingent truths, contingent falsities and necessary truths all
state possibilities. But contingent falsities give us the central cases of possibility, the cases for which the concept of possibility was introduced.

It is natural to develop this view by saying that it involves two levels of being. The actual world has the superior sort of being: actuality. The merely possible worlds have some sort of being, but they lack actuality.

I have just said that this view occupies a central place among non-Naturalist theories of possibility. But I do not mean that it is widely adopted. Many philosophers reject the notion of levels of being. Furthermore, as we shall see, there is a very powerful epistemological argument, due to D. C. Williams, which seems an almost conclusive objection to this view. The centrality of the Leibnizian view is constituted only by this: It is easy and natural to see other non-Naturalist theories as reacting to, and trying to mitigate, the difficulties of this view.

David Lewis (1986a) reacts by trying to raise the status of the merely possible worlds. His theory may be said to out-Leibniz Leibniz. Lewis advocates an indexical theory of actuality. Not only this world but every possible world is actual (from its own point of view). (Compare: ‘Everybody is I, from that person’s own point of view.’) Every possible world, including this world, is merely possible from the point of view of other worlds. (Compare: ‘Everybody is another from the point of view of anybody else.’) In this way Lewis re-establishes egalitarianism among the possible worlds.

An examination of the strengths and weaknesses of Lewis’s theory takes us deep into the theory of possibility. It will be discussed at length in the next chapter.

Both the Leibnizian theory and Lewis’s theory postulate what one might call genuine possible worlds. (They are realist theories, with Lewis’s the more thoroughgoing realism.) But there are accounts of possibility which try to give truth-conditions for statements of possibility, and for talk about possible worlds, without really postulating possible worlds. Lewis calls such theories ‘Ersatz’ theories (‘Paradise on the cheap’). The theory to be defended in Part II is a form of Ersatz theory. It gives an account of talk about possible worlds, and talk about possibility, in terms of

recombinations of elements found in the natural world. At this point, however, we are interested in Ersatz theories which appeal to entities over and above those admitted by Naturalists.

Non-Naturalists who hold Ersatz theories postulate certain actual entities over and above those entities postulated by Naturalists. They then try to construct substitutes for possible worlds, and to give an account of possibilities, with the aid of those non-Natural, but actual, entities.

Suppose, for instance, that one believes, as many philosophers have believed, that there are objective propositions. These propositions, one may think, are not spatio-temporal entities; they exist independently of any mind, and they can be true or not true. Such propositions then function as the objects of mental states such as belief. To believe that p is to stand in a certain sort of relation to the objective proposition p.

These propositions, part of actuality but not part of spatio-temporal reality, can then be used to build Ersatz possible worlds.

Robert Adams (1974) does it this way. Consider a domain which contains every pair of mutually contradictory propositions. Sets can be formed which draw no more than one member from each such pair, and where the members of the set are all consistent with each other. The set is maximally consistent if and only if no further proposition can be drawn from further contradictory pairs without making the set inconsistent. Such a maximally consistent set is called a world-story.

Such world-stories are not worlds. For this is an Actualist theory, that is, one which, unlike Leibniz and Lewis, recognizes only one world. But the theory can provide truth-conditions for talk about possible worlds. Thus:

There is a possible world in which p has as truth-condition:

The proposition that p is a member of some world-story.

Again,

In every possible world, q has as truth-condition:

The proposition that q is a member of every world-story.

Non-Naturalist but Actualist theories of possibility may be developed in different ways, but for my purposes I think that

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1 This statement will have to be qualified a little. Strictly, my view is a Fictionalist rather than an Ersatz view. See Chapter 3, Sections III and IV.
Adams’s theory is a sufficient representative. We have a threefold classification. There are two Realisms about possible worlds: the Leibnizian and the Lewisian, the latter a completely full-blooded Realism. In the Leibnizian scheme only one world is actual; the others are merely possible. In Lewis’s theory every world is actual from its own standpoint, but merely possible from the standpoint of every other world. Non-Naturalist Actualists agree with the Leibnizian view that there is only one actual world. But, unlike Leibniz, they deny that there are any merely possible worlds, except in a manner of speaking. At the same time, they hold that actuality goes beyond the Naturalist’s world of space and time. These non-Natural entities are then appealed to in order to yield truth-conditions for talk about possible worlds and possibilities.

Lewis says that non-Naturalist Actualists want the paradise of possible worlds on the cheap. I hope to attain that paradise at a still cheaper rate. Having criticized the three types of non-Naturalist theory, I shall develop a Naturalist theory of possibility and possible worlds. It will subordinate possibility to actuality, and furthermore to an actuality modestly, naturalistically, conceived.

It is to be noted that all the theories to be considered involve versions of the notion of possible worlds. The heuristic value, at least, of using the notion of such worlds seems to have been amply demonstrated in recent philosophical work (see Lewis 1986a, Chapter 1). Here I will mention just one application of the notion, an application of special value in metaphysical investigation, an application that will be made at a number of points later in this essay. I have in mind the notion of supervenience.

Suppose that one considers a certain subset of worlds, where each member of the subset has certain features in common. For instance, suppose that in each such world, the individuals in that world are distributed according to the same pattern, having exactly the same properties and relations. It may appear a plausible claim that, in each such world, certain further, or ostensibly further, features are fixed. For instance, in the case just considered, it appears that the resemblances of all individuals do not differ from world to world. The resemblances are then supervenient on the original features, the pattern of qualities and relations, which each world had in common.

What conclusions may be drawn from superveniences thus defined? The conclusion I wish to draw, the conclusion that gives this notion of supervenience its special interest, is that the supervenient is not really a feature of the world distinct from the features it supervenes on. The resemblances of things, for instance, are not really distinct from the properties and relations of things. We seem to be able to add that the properties and relations of things fail to supervene on their mere resemblances. For a different set of properties and relations might have exactly the same resemblance-structure. If this addition is correct, then it seems that we have here an argument for taking properties and relations to be primary, resemblances to be secondary.

II THE CAUSAL ARGUMENT

I will now advance an argument intended as a difficulty for any non-Naturalist account of possibility. The premises of the argument is that the objects postulated by non-Naturalist theories of possibility stand in no causal (or nomic) relation to the world of space and time. The conclusion is that we have no good reason to postulate such entities.

The premises is conceded by non-Naturalists. Other possible worlds, whether Leibnizian or Lewisian, are not thought to have any effect on our actual world. Nor is there thought to be any non-causal law of nature linking such worlds with our world. In the case of non-Naturalist Actualism, the non-spatio-temporal propositions, or other entities from which the surrogates of possible worlds are constructed, do not even have causal or nomic relations to each other, much less causal or nomic relations to our space-time world.

I do not claim that this premise gives us a conclusive reason for denying the existence of such entities. But I think it gives us a good reason for denying their existence. Our world of space and time is epistemically very secure. We have strong reasons indeed, derived both from bedrock common sense and natural science, to postulate its existence. (Even to use the word ‘postulate’ is to imply some lack of rational certainty, an implication which is potentially misleading.) To postulate entities which lie beyond our world of space and time is, in general, to make a speculative, uncertain, postulation. The postulation may perhaps be defended if it can be presented as explaining some or all of the spatio-temporal phenomena. But if the entities postulated lie beyond our world, and in addition have
no causal or nomic connection with it, then the postulation has no explanatory value. Hence (a further step, of course) we ought to deny the existence of such entities.

Non-natural possibilia are often defended by their upholders as theoretical postulations. Consider, therefore, the theoretical postulations of natural science. The explanatory value of the latter derives from the fact that the entity postulated makes a causal/nomic contribution to the natural world. No doubt it is wrong to say that every such postulated entity is a cause (or an effect). The postulated thing might be a property, and properties are not causes or effects. For instance, positive electric charge is neither cause nor effect. But objects can act causally in virtue of their positive electric charge, and that is the point of postulating such a property. The postulated thing might be a causal connection, or a law, either a causal law or a law of coexistence, and such connections are not causes or effects. But a causal/nomic connection obviously makes a causal/nomic contribution to the world.

By contrast, other possible worlds, or maximally consistent sets of immaterial propositions, are in no way causally or nomically linked to our world of space and time. They are postulated for purely semantic reasons. We appear to be able to make true statements involving possibilities and necessities. It is then argued that these statements demand truth-makers and that these truth-makers lie beyond our space-time world.

These semantic postulations, however, in no way explain anything that happens in the natural world. Hence there seems no reason to make them. I will illustrate the force of the argument by considering an analogous case.

Suppose that one was a Dualist in the philosophy of mind, and that one also held a Representative theory of perception. According to the latter theory, the immediate objects of sensory awareness are sense-data, or sense-impressions, which correspond, or fail to correspond, to physical states of affairs. But suppose in addition that one held the Representative theory in an eccentric form. Suppose that one held that the physical world stands in no causal or nomic relations to the succession of sense-data in individual minds.

Such a theorist might be asked what reason he thinks he has to postulate the existence of a physical world. Suppose that he answered that his reason was a semantic one. We continually make statements about physical objects and events. Such talk is in prac-

tice quite ineliminable. Moreover, we think that such statements are very often true. Furthermore, the statements, whether true or false, clearly purport to refer beyond sense-data, or any other content of our minds. Hence, this eccentric continues, we require physical objects, things quite other than sense-data, to serve as truth-makers for statements about sticks and stones, even though the latter are never causes of our perceptions.

I take it that it is clear that such a thinker would have put up a very weak case for the existence of physical objects so conceived. As a matter of fact, he would have a weak case even if he took the line that Malebranche took and postulated a God who was cause both of the order of our sense-data and of the physical order. Even with such an indirect causal link between minds and the physical world, the justification for postulating the latter would be very thin, as Berkeley saw clearly. But what of an atheist Malebranche arguing for the existence of independently existing physical objects? His case would be desperate indeed.

I suggest that the case for possible worlds or other possibilia lying beyond our world of space and time is equally desperate.

Strong as this argument seems, there are two considerations which should perhaps give us pause. The first, and most powerful, may be termed the Objection from Mathematics. (Logic perhaps gives rise to similar objections, but here I will restrict myself to mathematics.) The objection may be introduced by remarking that if the argument against Non-Naturalist accounts of possibility has any force, then it should equally have force against many other entities postulated by some philosophers. An example would be the postulation of transcendent universals. This extension of the argument to such universals is to be welcomed, I think. It does not weaken the argument in any significant degree. For it is not as if transcendent universals have a high epistemic credit rating. With mathematics, however, the situation is quite different.

Mathematics has given us an immensely fruitful, and steadily growing, body of results. It is hard to doubt that we now have an enormous body of mathematical knowledge. Moreover, this body of knowledge is of the utmost value for physical investigations. Natural science would be almost nothing without it. The question then arises, for philosophers at least, what mathematics is about. What are the truth-makers for true mathematical statements? It has often been claimed that these truth-makers are not in space and time. If
that is the true position, presumably they do not act on things in space and time. Upholders of non-Naturalistic theories of possibility can then shelter behind the skirts of mathematics. If mathematics requires non-natural entities, and, moreover, these entities have no effects upon nature, why should not theories of possibility postulate impotent non-natural entities in a similar way?

So an obligation on an upholder of the Causal argument will be to give an account of the truth of the propositions of mathematics without invoking non-spatio-temporal entities. Or, if the truth of mathematics is denied, as it has been recently by Hartry Field (1980), the obligation will be transformed into giving an account of the efficacy of mathematics in helping us to move from truths about the world of space and time to further truths about that world, without postulating non-spatio-temporal entities. The Causal argument itself gives us a strong intellectual motive for thinking that there is some satisfactory account of mathematics which is compatible with Naturalism. But without actually providing such an account of mathematics, the upholder of the Causal argument can hardly rest easy.

But, as David Lewis has pointed out in discussion, it is by no means sufficient for an upholder of the Causal argument to give a Naturalistic account of mathematics, if all that means is that mathematical entities are located in space and time. An opponent can argue *ad hominem* in the following way. What good will it do to drag mathematical entities down to earth if, when so dragged down, they remain causally impotent? If causally idle aspects of the natural world are countenanced, why not causally idle elements that lie beyond the natural world?

To illustrate the force of these two obligations on an upholder of the Causal argument in a more concrete way, let us consider the mathematical discipline of set theory. Set theory is peculiarly important here because mathematics can be exhibited as involving nothing but set-theoretical propositions about set-theoretical entities.

Apparent under the influence of Quine, it is customary to argue that set theory deals with Platonic objects. But Lewis has recently tentatively suggested (1986a, p. 83) that in the case of sets whose members are spatio-temporal entities, the sets are located wherever their members are located. The location is like the location of spatio-temporal aggregates, especially those cases where the parts of the aggregate are scattered. Sets of such sets are to be similarly located.

If this is correct (and I shall not discuss here whether it is correct, although I sympathize with the suggestion), then a set theory limited to spatio-temporal objects does not challenge Naturalism. Such a limitation will give the Naturalist what he needs. He may have to deny that there is literally such an object as the null class. But that seems a negotiable degree of scepticism. (Even that turns out not to be necessary. See Chapter 9, Section VI.)

But has this move helped the upholder of the Causal argument? Sets are where their members are. But does that give them any more causal power than if they are other-worldly? Is it not the members of (first-order) sets which act?

What I think a supporter of the Causal argument can say in reply to this point is that it may be evaded provided that the apparently impotent entities are *supervenient* on entities which are in some way causally potent. The notion of supervenience, as I have already indicated (Chapter 1, Section I), is best defined by an appeal to the notion of possible worlds, and so cannot be discussed in any depth at this point. But it is essential to this defence of the Causal argument to maintain, as I do maintain, that what supervenes is not really distinct from what it supervenes on.

Now in the case of sets, it seems clear that they supervene on their members. Going down the hierarchy, they supervene on the members of the first-order sets, members of which are not sets. But if the sets are not really distinct from what they supervene on, then, provided the latter have causal powers, any causal impotence of the sets is either non-existent or a trivial phenomenon reflecting special features of the way we talk about sets.

So I suggest that the upholder of the Causal argument against other-worldly possibilities may reply to the Objection from Mathematics by arguing that the truth-makers for mathematics are either entities in nature with causal powers, or else that they supervene on such entities. The Causal argument itself may be used as a reason for upholding some such account of mathematics.

This reply is programmatic only. It requires to be supplemented by a positive account of mathematical entities and mathematical truth. Such an account will be attempted in Chapter 9. To this will be subjoined an account of the nature of sets.

I pass to a second consideration which may cast doubt on the
Causal argument. Does not natural science itself postulate entities which are causally and nomically inert? Consider, in particular, Newtonian absolute space and time. It does no more than provide a neutral backdrop for causally active matter.

I do not believe that this objection to the Causal argument is anywhere near as weighty as the Objection from Mathematics. The Newtonian conception of space and time is not favoured by current cosmology. Space-time which is empty of matter is allowed. But there is no portion of space-time which is not the locus of a field of force, at least. Hence, every portion of space-time may be thought of as causally active, or at least as having causal potential.

As a result, I suggest that we can without misgiving uphold the Causal argument against passive or backdrop conceptions of space-time. I do not wish to deny the bare possibility of a totally passive background to the events of the world. But it is difficult to believe that such a backdrop could play a serious explanatory role in physics and cosmology.

I will finish this discussion of the Causal argument by pointing out that it suggests an eirenic way of holding an ostensibly non-Naturalist theory of possibility which is actually compatible with Naturalism. Go back again to the upholsterer of the eccentric form of the Representative theory where physical objects are thought to have no effect on minds, and so are not causes of sense-data. Such a theorist, I argued, would have no good reason to postulate a physical world.

One thing that an upholsterer of this strange theory could do would be to identify physical objects with (collections of) sense-impressions. Such a course would be approved of by Berkeley, for instance. But suppose that such a theorist rejected the Berkeleyan remedy, yet also became persuaded that he had no good reason to postulate a world of physical objects lying beyond the sense-impressions.

He could still argue that the conception of such a world was a useful conception. Let him agree that, because the world does not act on minds, he has no reason to think that such a world actually exists. Still, he may say, to refer, or better ostensibly to refer, our sense-data to such a world is a good way, methodologically speaking, to deal with these sense-data. We find it far easier to think and speak about the flow of our perceptions if we think and speak about them as, for the most part, perceptions of independently existing physical objects.

Might we not introduce possible worlds in the same spirit? Physical scientists find such conceptions as the ideal gas useful in organizing their talk and calculations about actual gasses. They do not think that the ideal gas exists, either in this or in another world. Nevertheless, they distinguish between true and false statements about the ideal gas. It is true that it obeys Boyle's law. The ideal gas is only one example among many. Consider also point-masses, parallelograms of forces, frictionless planes, perfectly elastic bodies, economic man and so on. Why should not philosophers, including Naturalist philosophers, treat possible worlds in this fashion? They have proved their worth in discussions of problems about possibility and necessity, counterfactuals, personal identity and so on. Nevertheless, they lack explanatory value, just as the ideal gas lacks explanatory value. So why not treat possible worlds as we treat the ideal gas: as things which do not exist, or at least as things which we have no reason to postulate, but which it is nevertheless convenient (if ontologically misleading) to talk about?

It does seem like getting things on the cheap. But the widespread and practically essential device of unrealistic idealization in natural science suggests that the practice is not a disreputable one. Realism is better than Fictionalism — provided Realism is not carried too far. A realistic account of ideal gasses is not required. Why require a realistic theory of possible worlds? The Combinatorial theory to be developed in this work is a Fictionalist version of Combinatorialism.
Non-Naturalist
theories of possibility

I AGAINST THE LEIBNIZIAN VIEW

The view now to be criticized is that, while ours is the only actual world, there do exist, in some sense of the word ‘exist’, merely possible worlds, set in one-to-one correspondence to, indeed constituting, the ways that the actual world might have been. It may or may not have been the view of Leibniz, but it is convenient to call it the Leibnizian view. It involves two levels of existence: the actual and the merely possible.

There exists a strong argument against this view, first stated, as far as I know, by D. C. Williams. It has since been endorsed by David Lewis, who heard the argument from Williams. I was told about it by Lewis.

Williams says:

There is no more thorough-paced philosopher than Leibniz, and the relations of essence and existence are the very crux of his system; yet he tells us almost nothing about existence except that it is contingent and a predicate, and he half retracts these. He never intimates, for example, how he can tell that he is a member of the existent world and not a mere possible monad on the shelf of essence. (1962, p. 751–2)

It is illuminating, and convenient, to spell out the argument as a proportional syllogism:

(1) All but one of the infinity of worlds are merely possible (hypothesis)
(2) This is a world (containing Leibniz, the propounder of the argument, etc.)

\[ \therefore (very probably) \]

(3) This world is merely possible.

However, the conclusion (3) is absurd. It is obvious that this world is actual. So we have good reason to reject (1) as false.

The probability involved here is a logical probability, and as such it is relative to the premises. As a result, it is subject to the well-known total-evidence condition. The premises by themselves establish an overwhelming probability. But perhaps we have other knowledge or rational belief which enables us to reject (3)?

What then of our knowledge or rational belief that this world is actual which was used to negate (3)? We may not have any evidence for this proposition. But is it not part of bedrock common sense? Is it not one of those Moorean propositions of whose truth we are far more assured than any premiss in any philosophical argument that may be brought against it? Is it not properly part of our ‘total evidence’?

It seems, however, that once (1) is granted this assurance must evaporate, and so cannot be incorporated into the total evidence. For given (1) then it follows that there are innumerable possible worlds where people take it to be bedrock common sense that they are actual. Yet there is only one of these worlds where their opinion is true. In such a context, assurance of actuality is worthless. At the same time, however, it remains open to common sense to use our assurance of actuality to modus tollens the argument, and so take (1) to be false. And that seems vastly preferable to accepting (1).

Ad hominem against Leibniz, if the sole actual world is the best of all possible worlds, as he maintained, then, granted (1), it is all the more likely that this world is a merely possible world.

Lewis, of course, is driven by the argument to his more thoroughgoing theory, the indexical theory of the actuality of worlds. The Williams argument has no force against his position. To Lewis’s theory, therefore, we now turn.

II IS ACTUALITY INDEXICAL?

Lewis holds, as every Realist about possible worlds holds, that other possible worlds are never spatio-temporally or causally related to our world. Some other worlds resemble our world, but resemblance is an internal relation, determined solely by the nature of the objects related. It does not involve these objects being in any way connected. Lewis is not sure whether he should analyse resemblance in terms of universals. He is sure that, if he does admit universals, he will admit instantiated universals only (instantiated in some world). If universal U is instantiated in W₁ and W₂ (some-