Minimizing Arbitrariness:
Toward a Metaphysics of Infinitely Many Isolated Concrete Worlds

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A particular fact or event often appears arbitrary and puzzling, until it is exhibited as the outcome of certain causal processes. Usually, though not always, such a causal explanation helps to relieve the feeling of arbitrariness, at least for a while. But it is easy and natural for our feeling to reassert itself: We are moved to ask why just those causal processes governed the situation of that fact or event, rather than some others. To deal with this further, larger question, often we can exhibit those causal processes as being, themselves, the results of, or certain specific instances of, prior or more general causalities. Or, much the same, we can redescribe the initial particular fact, and perhaps the cited cause as well, and display the items thus described as an instance of some very general, fundamental law or phenomenon. But any of this will only push the question back one step more. For we can always press on and ask: Why is it that just that very general phenomenon, or law, should be so fundamental, or indeed obtain at all, in the world in which we have our being? Within the usual framework of explanation, law and causation, there seems no place for such curiosity to come to rest. There seems no way for us to deal adequately with the brute and ultimate specificity of the ways in which almost everything appears to happen. And what seems worse, the specific character of certain of these laws or ways, even of quite fundamental ones, often seems so quirky, the very height of arbitrariness.

For an example of what I mean, why is it that, as science says, there is a certain particular upper limit on velocities for all (ordinary) forms of physical objects (which is, in familiar conventional units, very nearly 186,000 miles per second)? Why does just this limit obtain and not some other one, or better, some range of variation of uppermost speeds? Why must causal processes involving motion all conform to this particular restriction, rather than to some other, or to no such restriction at all?

For another example, why is it that almost all of the matter that there is
comes in just three (rather small) sorts of "parcels" (protons, electrons, and neutrons)? Why not so much matter coming in just two sorts of parcels, at the level now in question, or better, just one sort?

For a third example, we may consider what current science takes to be the basic (types of) physical forces of nature: As of this writing, scientists recognize exactly four of these forces. At the same time, physicists are hard at work seeking to unify matters at least somewhat, so that there will be recognized no more than three such basic forces, possibly fewer. Certain deep intellectual feelings, feelings that are, I believe, shared by many scientists, philosophers, and others, motivate this reduction. Along such reductionist, unifying lines, these rationalist feelings will not be much satisfied until we think of our world as having, at base, only one sort of basic physical force (or, alternatively, having none at all, forces then giving way to some more elegant principle of operation).

1. TWO FORMS OF RATIONALISM

How far can these rationalist feelings be followed? Unless his world is so chaotic as to be beyond any apparent cooperation, for a scientist it will almost always be rational to follow them as far as he can: Reduce the specificities of one's world to a very few principles, maybe one, operating with respect to a very few (kinds of) substances, maybe one; further, have the ultimate quantitative values occurring in the principles be as simple and unquirky as possible.

If scientists are extremely successful in satisfying these feelings, a philosopher (who may of course also be a scientist) might rest content with just those findings. Such a philosopher will hold a unique and beautifully simple principle to hold sway over all of (concrete) reality. Let me call this philosopher a moderate rationalist.

Another sort of philosopher will press on with these feelings, even in the face of the enormous scientific success just imaginatively envisioned. He is an extreme rationalist, and even in that happy situation, he will say this: Though the working of our world is as elegant as might be, why should everything there be behave in accord with just this specific principle? Why should any specific way, even a most metaphysically elegant, be preferred to any other specific way for a world to be? Why shouldn't there be somewhere, indeed be many domains, where things are less beautifully behaved? If so, then, over all, everything there is will be metaphysically most elegant, the universe as a whole preferring no specific way to any other, but, rather, giving each and every way its place and due. With a suitably enormous infinite variety of independent domains, of mutually isolated concrete worlds, we will have, over all, the least arbitrary universe entire; otherwise we will not, over all, have so little arbitrariness.

Both of these forms of rationalism are appealing to our deep rationalistic feelings (even while we have other feelings that go against them both). In this paper, I will not substantially favor either form over the other. Nor will I argue that it is most rational for us to adopt either of the rationalisms. My aim will be avowedly rationalist, but it will also be modest: I will be arguing that, at least in the evidential
situation in which we do find ourselves, the metaphysics proposed by an extreme rationalist (for any evidential situation) should be taken very seriously. In other words, at least in our actual evidential situation, we should take very seriously a metaphysics of infinitely many mutually isolated concrete worlds.

Now, though it is not quite so dominant as it was some years ago, a heavily empiricist approach to concrete reality is, still, much more fashionable than a more rationalist approach. Accordingly, many philosophers will tell us not to worry about any apparent brute and fundamental arbitrariness in nature, which we seem to see and are, in fact, at least somewhat troubled by. Taken altogether, they will say, things just are the specific way that they are or, if one insists in putting it so, the specific way they happen to be.

Perhaps this basic empiricist attitude is unobjectionable; I do not know. Although I find it somewhat unappealing, perhaps there is no way it can be faulted. At the same time, there seems nothing that requires us to prefer this fashionable approach and to reject a more rationalist approach to all of concrete reality.

2. A RATIONALIST MOTIVATION FOR CONCRETE POSSIBLE WORLDS

In our physical science, I am told, certain magnitudes are taken as fundamental and universal. For instance, an example already cited, there is a fundamental upper limit on the velocity of any (normal) particle or signal. But, why just that upper limit, for all such speeds, everywhere and always? Why not just a bit more speed allowed or, alternatively, not even that much, if not around here and now, then many, many galaxies away, or many, many eons from now?

Consider a physical theory according to which there was a limit on speeds, but one that varied with the place of the mover in question. This might be due to, as the theory says, the mover’s place being under an influence that varies with respect to place—for example, the influence of vast structures of intergalactic structures of matter, which surround any given place in all, or many, directions. On such a theory there would be no universality to, and thus no universal preference for, just the limit in our (only pretty big) neighborhood. Far away enough over there, the limit would be higher; and far enough away over there, it would be lower. Because it would not be universal, our neighborhood speed limit would not seem, or be, so arbitrary. By localizing our specificity, we minimize the arbitrariness that is associated with it.

A strategy of localization, it seems to me, does have its merits. But the present attempt at applying the strategy has at least two difficulties. First of all, according to what science seems to tell us, there is little or no evidence for thinking that our world conforms to the sort of theory just considered. Rather, available evidence seems to indicate the opposite: (Even if given infinite space) we’ll get the same speed limit for every (big) neighborhood, no matter how remote from ours it may be. Moreover, there seems to be a lot of evidence that we don’t have infinite space, or infinite time.) So an attempt at spatial localization does not in fact seem feasible.
Second, and perhaps more important, any imagined law of variation of speeds would itself have some numbers constant for it. And then we might ask: Why should velocities vary with surrounding spaces in just that way, with just those constants constraining variation? Why shouldn’t the regularities of varying speeds be otherwise, other than they happen to be in our whole physical world?

To remove or to minimize this remaining arbitrariness, we might try to “localize” the mode of spatial variation, too, staying with our general strategy. But how are we to do so? We might stretch things out over time: Different variation factors for different vast epochs. But the same problems arise here, too. First, what evidence there is about physical time is not so congenial. And, more fundamentally, there will be left as universal (and unexplained) some factors for variation over time of the space-variation constant(s). Why should just those temporal factors hold, and hold universally? Why not some others? Either we must admit defeat or we must reach out further, in order to achieve a new form of localizing.

Having used up all of space and time, even assuming both are infinite in all their directions, where do we go? We must expand our idea of the “entire universe,” of all that there is. But in what way? A certain philosophical conception of possible worlds might provide the best route for our rationalistic localizing strategy. Indeed, it might provide the only route. It is my rationalist suggestion, then, to try to make more sense of concrete reality by adopting a metaphysics of many concrete worlds.

3. TWO APPROACHES TO A METAPHYSICS OF ISOLATED CONCRETE WORLDS: THE RATIONALIST AND THE ANALYTIC

It will be in a tentative and an exploratory spirit that I will advocate a metaphysics of many concrete worlds. The view I will favor is at least very similar to, and is perhaps the very same as, the view of such worlds developed by David Lewis. My present motivation for taking such a view seriously, however, is quite different from his (main) motivation. The differences are such, it will emerge, that my approach is aptly called rationalist, or rationalistic, whereas his approach might better be called analytic, or analytical. It seems true however, that, at least in their main elements, the rationalist approach and the analytic approach are entirely compatible with each other.

Let us suppose the two approaches are indeed compatible. Then whatever motivation each yields can add to that from the other, so as to make more acceptable their shared metaphysical position. It is my hope that this is so.

At the same time, there are those philosophers unfriendly to this metaphysics for whom, I suppose, Lewis’s analyses themselves are entirely unhelpful and implausible. Now, insofar as my rationalistic approach can be made appealing, such thinkers will have, perhaps for the first time, at least some motivation for accepting a metaphysics of many concrete worlds.
4. POSSIBLE WORLDS AS CONCRETE ENTITIES

It is fashionable for philosophers to talk of possible worlds. But much of this talk seems metaphorical, or heuristic, at best. This observation has moved several philosophers, J. L. Mackie being notable among them, to question the (significance of) this fashion. In his Truth, Probability and Paradox, Mackie writes "... talk of possible worlds ... cries out for further analysis. There are no possible worlds except the actual one; so what are we up to when we talk about them?" In my opinion, these words express a dilemma felt by many philosophers, though Mackie expresses it in a somewhat oblique and indirect way.

More directly put, the dilemma is this: Philosophical accounts of possible worlds fall into either of just two baskets. In the first basket are accounts where 'possible world' is to denote some "abstract entity," such as a set of mutually consistent propositions that, together, purport to describe comprehensively the world in which we live. Presumably, just one of these sets yields a completely successful description, all the others than failing.

Whatever their philosophical value, such accounts use the expression 'possible world', and even the word 'world', in a way that is bound to mislead. For such accounts, the world in which we live is not a possible world at all, let alone the most vivid and accessible example of one. For we live in a world consisting, directly and in the main, of stones, animals, people, and suchlike, not of sentences or propositions (however numerous and well behaved). We live in a world that is, at least in the main, concrete. So it is most unclear how any other candidate worlds, on the one hand, and the world we live in, on the other, might be suitably related so that all of them are worlds. Such accounts, then, tend to collapse into mere heuristic devices, even if some may be very helpful heuristically.

In the second basket, we find the story told by David Lewis and variants upon it. On such accounts, possible worlds are concrete entities, generally constituted of smaller concrete things that are at them, or in them. In this central respect, all of the (other) possible worlds are just like the actual world, the world in which we live. On this sort of account, the relations between worlds are just those of qualitative similarity and difference, as regards the various respects in which these concrete entities may be compared. These relations are of the same sort as some of those that obtain between "lesser" objects, e.g., between individual inhabitants, whether of the same world or of different ones.

On Lewis's treatment of worlds and their parts, no object can be at, or be a part of, more than one world, while every concrete object is at, or is a part of, at least one world. So each concrete entity that is itself not a world, but is only a world-part, is a part of exactly one of the infinity of concrete worlds. I shall assume this treatment in what follows. I will advocate a many worlds metaphysics where each chair and each person, for examples, are at one and only one concrete possible world: A given chair, or a given person, is just at its own world and, thus, is not identical with any chair, or any person, that is at any other world. At most, the others are (mere) counterparts of the concrete objects first considered.
How does such a story go as regards relations of space, time and causality? First, there are some tiny worlds; the whole world here is, say, a single space-time point. Beyond those, the concrete inhabitants of a given world are related spatially and/or temporally and/or causally to at least some other inhabitants of that same world, so the world forms a spatial and/or temporal and/or causal system. But inhabitants of different worlds do not bear any of these relations to each other, nor does any complete world bear any to any other complete world. Causally, spatially, and temporally isolated from each other are the infinity of worlds.

In this second sort of account, it seems to me, it is clear enough, and not misleading, how the others, like the actual world, should all be worlds. But there is another sort of trouble with this account: It seems incredible, crazy, way beyond the reach of any even halfway reasonable belief.

So this is, in brief, our dilemma of possible worlds. On any account where matters are not incredible, things seem badly obscure or misleading. On any where things seem much less misleading, we face a “universe” that seems utterly incredible. What are we to do?

Formally, at least, there are three alternatives: First, we just don’t take talk of possible worlds to be literal or serious; we treat it as at best a helpful heuristic. Second, we work out some way in which it’s clear how both some abstract structures, on the one hand, and our actual concrete selves and surroundings, on the other, can all be worlds. Finally, we try to make a story of isolated concrete realms somewhat more credible, or less incredible.

Largely by way of a rationalist strategy of “localizing” specificity so as to minimize arbitrariness, we will be attempting the third alternative. So, we are at once involved in two tasks: One, making our own world seem more intelligible by incorporation of it into a relevantly vaster universe; two, making sense of other worlds by showing how they can form a system, a vast universe, by reference to which our actual world can be seen as being less disturbingly peculiar.

5. THE ANALYTICAL MOTIVATION FOR CONCRETE POSSIBLE WORLDS

At least for the most part, the analytical motivation for the metaphysics of many concrete worlds is best provided by Lewis. He does this in, among other writings, his early paper “Counterpart Theory and Quantified Modal Logic” and, later on, in his book Counterfactuals. For present purposes, I might assume a familiarity with that motivation, especially as there is little of it that I can express as well as Lewis already has done. Still, as some may want reminding of the relevant aspects of the works in question, I will attempt a sketch of the analytical motivation here, a sketch that must be as crude as it is brief.

Now, some of the things believed by us are clear enough as regards their content. For example, it is relatively clear what is believed when I believe that the chairs in my living room are arranged in a rectangular pattern. In contrast, other things we believe seem to be quite obscure and even mysterious: that the chairs in
my living room might have been arranged in a circular pattern (instead of in a rectangular pattern). Now, either we construct some theory, some analysis, of the content of the latter beliefs that renders the obscurity and mystery superficial, thus removing or at least lessening it, or else we leave things alone, our opinions then continuing to be fraught with mystery. The latter alternative is philosophically unappealing. Hence, there is motivation to construct a clarifying analysis.

On Lewis's analysis, we quantify over, or refer to, concrete objects that are other than our actual world or any part thereof. So the believed proposition that the chairs in my living room might have been arranged in a circular pattern is understood, roughly, as the proposition that there are worlds with chairs very similar to my living room chairs in rooms very similar to my living room, all in a very similar set of relations (mainly of "possession") to people very similar to me, and in at least some of those worlds the relevant chairs are arranged in a circular pattern. The subtlety of Lewis's analysis lies, of course, in the details that make such a rough treatment as the one above into a very much smoother treatment. But the general point is clear enough even now: the more mysterious "might have been" is understood in terms of the quite straightforward "are." By acknowledging many more chairs, rooms, and people than we ordinarily envision, we can understand everything here believed in terms of rather unmysterious relations—similarity and also circular arrangement—obtaining among suitably "full-blooded," unmysterious objects—chairs, rooms, and people.

Of particular interest to Lewis and to many other philosophers are our beliefs in counterfactual conditional propositions. An example is (my belief that) if the chairs in my living room were arranged in a circular pattern (instead of their actual rectangular one), then I would have been displeased at their arrangement. When reflected upon, such propositions appear to involve very mysterious nonexistent situations. But we believe many of these propositions to be true. So, again, a clarifying analysis is wanted.

Lewis offers an analysis that is of a piece with that offered for the simpler modal beliefs just considered. For our example, the analysis proceeds at least roughly as follows: There are the many worlds; among them are some where there is someone much like me who has his living room chairs arranged circularly; among these worlds some differ more than others from our world; in the ones that differ least—scarcely at all, except for the arrangement of such chairs—the chair owner, or any chair owner most like me, is displeased at the circular arrangement of his living room chairs.

As before, so again: By admitting lots more chairs, rooms, and people than are usually entertained, and by admitting lots more worlds for all those things to be in, we can understand accepted propositions in a manner that renders them relatively straightforward. We can understand them in a way that dispels much of the air of mystery that initially seems to surround them.

Sometimes we are in a mood when philosophical analyses seem of substantial value. When I am in such a mood, Lewis's analyses of the noted propositions often, though not always, strike me as accurate enough to be of value. Sometimes we are
in a very different mood: How can any proposition apparently so fraught with obscurity, mystery, and problems be equivalent to one that is so very much more straightforward and, apparently, problem free? The mood this question signals is hardly peculiar to our thought about modals and counterfactuals, much less to Lewis's analyses thereof. The same doubts concern, for example, analyses of propositions about knowing, where the statement doing the analyzing seems so very much more free of all sorts of skeptical problems and paradoxes than does the knowledge claim itself. Further examples abound; the philosophical situation is quite a general one.

When we doubt the value of philosophical analysis, two things can be tried. First, we can try to show ourselves, via subtle psychological explanations, that two propositions can indeed be equivalent, in as serious a sense of “equivalent” as we might wish, and yet strike us as being so different in those respects just noted. With enough ingenuity, perhaps this can be done for a substantial range of interesting proposed analyses; perhaps it can be done, in particular, for Lewis's analyses of modal and counterfactual propositions. But maybe that won't really work well, either generally or for the particular cases currently in focus.

A second thing we might try is to construe a proposed analysis as an explication. Now, we take what we begin with as inherently problematic, not just of a form that, typically, engenders illusions of real problems in beings with minds like ours. In a sense, what we begin with is beyond full redemption. Then, explicating, we do this, or something of the like: We put forth something that preserves a relatively unproblematic core, but then only such a core, of that which we find so problematic. Generally, an explication will add something to the core that it preserves. When something is added, the addition will dovetail well with what is preserved from the original; it will yield something very much “along the lines” of the original problematic thought, but, at the same time, it will be relatively clear and problem free. We can, then, have a variety of explications of any given problematic thought, none of which is equivalent to that thought or to each other, but none of which differs very greatly in content from the original thought. Each of these, if there is more than one, will be a good explication of that troublesome original.

I do not think that Lewis ever offers his system as (part of) a program for such explications, not analysis proper. Yet I feel free to take it either way and, depending on how I feel about analysis itself, sometimes I take it in one way, sometimes in the other. Whether taken as analysis proper or as explication, Lewis's proposals can give us some analytic motivation for the metaphysics of many worlds.

Somewhat conservatively, I'd like to say this: Either Lewis's proposals provide accurate analyses, as he intends, or, if not that, then at least they provide good explications of those troublesome thoughts to which he turns his attention. That is something I'd like to say. Is it true? I am uncertain. Fortunately, we need not decide this issue here.

As will be remembered, our own project is to present appealingly the rationalist approach to many worlds, not the analytical one. Even so, we will continue to refer to Lewis's motivation. This is understandable. By noting its contrasts with the analytical approach, we can help make clearer the rationalist approach we are proposing.
6. THE MUTUAL ISOLATION OF THE MANY CONCRETE WORLDS

To minimize arbitrariness, and make the world more intelligible, we need to employ our strategy of localization. Then any particular way things happen will be less than universal and will be offset by, and thus not preferred to, other ways things happen elsewhere. This gives an argument for the causal isolation of concrete worlds and their respective inhabitants.

Suppose there is a concrete world \( A \) and another one \( B \) with, say, an individual rock, \( a \), an inhabitant of \( A \) and not of \( B \) and an individual window, \( b \), a part of \( B \) and not of \( A \). Can rock \( a \) have any effect upon window \( b \), perhaps if accelerated to some enormous velocity and at once being exceedingly massive?

Suppose that \( a \) interacted with \( b \) so that it broke \( b \) or, perhaps, so that it turned \( b \) into a translucently colored, purple window. Then there would be certain laws, or regularities, or whatever, that governed or described the way that at least some objects of \( A \) interacted with at least some objects of \( B \). However interesting or uninteresting to us in their formulation, any such law would have some particular character. We can then ask: Why do the interacting objects of \( A \) and those of \( B \) interact in just that way, or in just those ways, and not in some other manner? Why is the character of their interaction just the way it in fact happens to be? We face the threat of arbitrariness.

Our strategy is to localize any such threatening arbitrariness. We implement it, in this case, by having \( A \) and \( B \) as two (only somewhat isolated) realms of just one world. (We can talk of these realms, of course, as worlds, but then we use 'world' in a new sense. To avoid needless ambiguity, let's not now talk in that way.) Then the way in which realms, or objects in realms, interact in this world, \( W_1 \), will be just one way things happen in the universe entire. There will also be (infinitely) many other worlds, \( W_2, W_3, \ldots, W_n, \ldots \), in each of which there are two realms that interact in other ways. And there will be infinitely many other worlds with no interacting realms. And there will be infinitely more still other worlds with three interacting realms, and so on. Now, all of these worlds together allow us to see as local any specific manner of the interacting of any objects. But they can do that only if they themselves are all mutually isolated and present no higher-order interactions of any particular character or manner whatsoever. Thus, from the point of view of our strategy, there must be largest isolated concrete parts of the universe entire. It is these concrete items that we have been calling worlds and that, quite understandably, we will continue to speak of with that appellation.

Perhaps the argument just given is, even in its own rationalist terms, somewhat incomplete. Suppose that for any given world, \( W_1 \), there is interaction between it and every other world of an enormous infinity of worlds. Then there might be no arbitrariness for a given interaction law and each of the, say, two worlds it relates. For a world with just the character of either one of the two will interact in each of an infinity of other lawful ways with (at least) one world with just the character of the other. And perhaps we can generalize from two worlds, and pairwise interaction,
to any number whatever. Then there will be, even across worlds, objects interacting in every imaginable way and then some; no way of interacting will be preferred to any other.

Is so very much interaction for a world a coherent possibility? Can there really be laws operating in such multiplicity at all, or any such infinitely various causality? I think not.

Suppose, as may be, that this negative thought is misplaced. Then there still remains one rationalist line of argument for causal isolation: It is at least somewhat arbitrary that a given world, any world, interacts at all with any other world, whether the world interacts with only one other world or whether with an enormous infinity. Interaction is one specific way of relation, and noninteraction is another; so neither happens universally. For any candidate world of any character, at least one such candidate interacts with other candidates and also, elsewhere in the universe entire a duplicate candidate doesn’t interact. The candidate that does interact is but a realm of a larger world, the world itself containing such interaction but not interacting. Only the duplicate candidate that fails to interact is a proper world and not a realm, or inhabitant, of a world. Whatever interacts, then, is not a world; so there are infinitely many concrete worlds, none of them interacting.

The rationalist approach argues for causal isolation among real concrete worlds. The analytical approach moves us in the same direction: It often seems puzzling what is claimed where we say one event caused another. So we want a clarifying analysis of what it is for one particular thing or event to cause another. Now, following a suggestion of Hume, Lewis and others have attempted to analyze such singular causal judgments in terms of counterfactual conditional statements involving the (alleged) cause and the (alleged) effect. Very roughly, "c caused e" is analyzed as: if c had not occurred, then c would not have occurred. (To make matters smoother, the analyzing counterfactual must be made more complex and must also be understood in a suitably context-sensitive manner.) Hard as the work is to smooth things out adequately, the underlying idea is intuitive and appealing.

Now, as a formal possibility, one may adopt some such counterfactual analysis of causality and, at the same time, have no theory of counterfactuals themselves. But, at best, that would be displaying two apparent mysteries as being at base one. So we are moved to adopt a clarifying analysis of counterfactuals as well.

As indicated previously, Lewis's analysis of counterfactuals is a promising view. Wedding this analysis to a counterfactual analysis of causation gives one an analysis of causation in terms of relatively straightforward (noncausal) relations among concrete worlds and inhabitants thereof.

With this background well enough in view, we ask: What does the analytical approach indicate, or perhaps even require, as regards causal relations between concrete worlds? There occur two sorts of argument: a "cautionary" one and a more substantive one.

The cautionary argument: Propositions about causal relations in a given world are, as remarked, analyzed in terms of (less mysterious) noncausal relations between the relevant parts of that world and certain parts of other worlds. Now, providing
that these worlds do not themselves enter into causal relations, there will not lurk somewhere in the relations analytically employed a circularizing causal feature. But if there are causal relations between worlds, as well as within worlds, there is at least a threat of circularity.

The substantive argument: Any propositions as to transworld causation will be unanalyzable in terms of the theory. Then they will be without any noncircular analysis and, requiring one as they do, these propositions will have a content at least as mysterious-seeming as our more ordinary causal judgments. So there will be an insoluble problem just in case some such positive propositions are true. Given this approach, we conclude that there are no true propositions stating transworld causal relations.

If the inhabitants of any given world never interact with those of any other, then the items from the different worlds will not be connected in any realistic way. So they won’t form very much of a unified system. Still, if the inhabitants from different worlds were spatially related, they would be in a system of spatial relations, and that would satisfy our idea of unity to some considerable degree. Likewise, if the events of one world were related temporally to those of others, then that would be an inclusive temporal system that could play some unifying role. But, it can be argued, these relations do not obtain, nor do any other “dimensional” relations.

We have just supposed a separation between causal relations, on the one hand, and relations of space and time on the other. But perhaps there really is no such separation. Rather, space, time, matter, energy, and causality, in a suitably general sense of this last term, must all be understood in terms of each other. So a real space has causal properties that influence the course of matter and energy in it over time. The causal features of a space are inherent to, inseparable from, its real geometry. Now, some (whole) spaces will bend light rays a certain amount in a certain direction, others more so and others less. Still others will leave the light’s path un-bent. As the former spaces will be understood as influencing the light’s path in (what are to us) more striking ways, so the latter may be understood as influencing it, too, but in what are (regarded by us as) less striking ways. Well beyond this example, the considerations can be generalized. So causality cannot be removed from realistic spatial and temporal relations between concrete items, that is, from any spatiotemporal relations that might suitably serve to connect them into a unity. If this is right, then the arguments just preceding, as they undermine all alleged transworld causal relations, will, in particular, undermine any arguments relevant to any alleged transworld spatial and temporal relations. In conclusion, any (inhabitant of any) concrete world will be spatially and temporally unconnected with any other (inhabitant of any other) concrete world.

Suppose one has no belief in what I’ve just said. Suppose one thinks, instead, that space and time really are independent, in every important sense or way, from questions of causal relation. Even so, our rationalist approach will lead one to think that the concrete worlds are isolated spatially and temporally.

Recall our discussion of section 2. We saw there that, in order to implement our strategy of localization satisfactorily, we need a universe entire that comprises
much more as to space and as to time than all of the time and space of our world (even if our space and time are infinite in all their directions). We need, that is, a universe comprising infinitely many spaces and times and infinitely many worlds of which those are (some of) the dimensions. These worlds will not themselves be spatially or temporally related, for that would fuse into one the various spaces, and the various times, needed as distinct for a full implementation of our localizing strategy. From our rationalist perspective, therefore, we are motivated to accept the idea of many concrete worlds that are each totally isolated from all of the others.

7. ON THE RESISTANCE TO THE IDEA OF INFINITELY MANY ISOLATED CONCRETE WORLDS

Let us confront the great resistance people feel toward the view of many mutually isolated concrete worlds. For unless we unearth implicit factors of resistance and promise to do something to disarm them, any more positive steps toward greater credibility are likely to fall on deaf ears. Why, then, are so very many philosophers, as indeed they are, so terribly resistant to such a view? Why do people think it so crazy to consider such a view a serious candidate for acceptability?

The metaphysics we propose to take seriously posits a group of concrete worlds with two salient features. First, infinite diversity: every way for anything to be, or behave, is a way that (some) things are, or do behave, if not in a particular given world (say, the actual world), then in some other one. Second, total isolation: each world is totally isolated from every other world. Each of these two features does, as a matter of psychological fact, promote much resistance to our metaphysical view.

The matter of infinite diversity has been rather extensively discussed in the literature. For example, this diversity has been thought to undermine the rationality of predictions about the actual world, and it has been thought to foster an attitude of indifference toward our own future actions and their consequences. Does the infinite diversity implicit in our metaphysics have such dire implications, otherwise avoidable? If so, then that would be reason, even if not conclusive reason, to reject the metaphysics.

Especially in his most recent writings, Lewis has argued, convincingly to my mind, that there are no such problems stemming from a metaphysics of infinitely many concrete worlds, but only various confusions to such a threatening effect. Although it would be useful for still more to be said to counter this source of resistance, there is not now an acute need to do so.

I turn, then, to spend some energy meeting resistance stemming from the other main feature of our metaphysics, total isolation. The total isolation of each world promotes two main sorts of worry. One of them is more blatant and obvious; the other, I think, is more profound. Both merit some discussion in the present essay.

The more obvious worry is this: in that there is total isolation of worlds, there is, in particular, complete causal isolation among them. So nothing in our
world, ourselves included, will ever interact with any other world, or anything in any other world. Accordingly, the metaphysics in question posits all sorts of things that none of us ever will, or ever can, connect with any experience or observation. Worlds there are with cows that fly, and with particles generally like our electrons but a hundred times as massive. As we are causally isolated from these worlds, cows, and heavy electrons, we can never perceive them, nor any of their causes or effects. So it seems that we can never have any experiential reason for thinking there to be such things. But if no experiential reason for such a thought as to such contingent existents, then no reason is possible for us at all. Such a rarified metaphysics is difficult even to tolerate, let alone to find at all acceptable.

This worry can be met in either of two main ways. As I understand him, Lewis would meet it by arguing that we need not have experiential reason to believe in such otherworldly things to accept them with reason. Rather, adequately searching ratiocination about contingency and necessity, conducted (largely) a priori, will give us reason enough for our metaphysical view. This is, or is very close to, a position of extreme rationalism. Now, whatever the strengths and the weaknesses of this sort of answer, there is another way to meet the worry in question.

From a position of moderate rationalism, we can argue that there can be some very indirect experiential evidence for the idea of such outlandish, isolated entities. Near this paper’s end, in sections 10 and 11, I will attempt such an argument. Moreover, I will there argue that we now do have some such indirect experiential reason, or evidence. But, as indicated, this argument will have to wait.

For there is another worry stemming from causal isolation that is, though less obvious, philosophically deeper and more important. That deep worry is this: According to so much of our commonsense thinking, all of concrete reality forms a single, unified system of concrete objects. We are among the objects of the system, as are our parts and the particular experiences and thoughts we produce, or enjoy, or suffer. So are the many things around us. Each of these objects is, somehow or other, temporally related to every other one. Each of those that are in space at all (and maybe all of them are in space) is spatially related to all the other spatially located objects. Finally, there is at least a presumption regarding any two concrete objects that they are both embedded in (at least) one causal, or quasi-causal, network or system.

However well or badly conceived it may be, this aspect of common sense is very important to us. For it would serve to satisfy our belief, perhaps even our desire, too, that all of reality be sufficiently unified, at least all of concrete reality. Or so we are given to think. For, as we usually reckon matters, without causal, spatial, and temporal relations among them, the concrete entities that exist will not be sufficiently connected for all of them to be parts of a universe that is an intelligible unity or whole.

The view of isolated concrete worlds, with their mutually isolated different inhabitants, does not allow for these wanted connections. Thus it does not present all of the concreta there are as forming, or as belonging to, what is an encompassing unity.
Let us now turn to deal with this negative thinking, proceeding by stages through the next two sections.

8. THE UNIVERSE ENTIRE, THE OBJECTS IN IT, AND CONDITIONS OF UNITY

In the face of this negative conclusion, how might we make less incredible a metaphysics of infinitely many concrete worlds? They, and their respective inhabitants or parts, will be utterly isolated from, and unconnected with, each other. Yet we do believe that they all belong, somehow, to one universe entire. How can they be so unconnected and yet participate in an appropriate unity, so as to achieve this belonging?

We want a credible answer. But it is important not to expect too much from a candidate answer. For we might well be confused, at least much of the time, in our conception of what the whole universe is. We might often be prone to take it to be very much like one of its mere parts or constituents, whereas it may in fact be very unlike any constituent, however great, that it ever might have. If we are prone to such a confusion, then we might be prone to think like this: The conditions of unity for the universe entire must be very like those for certain of its objects, in particular like those for some grand and complex possible world. Now, the unity conditions for individual worlds are rather stringent; perhaps each part of any such world must be at least temporally related to (at least some) other parts. Hence, we might conclude, the universe itself must have all its part in such a connected system. From this perspective, perhaps a badly confused one, the metaphysics of possible worlds will seem to yield a universe so many of whose parts are so very, very inappropriately related.

It is my suspicion that, at bottom, this line of thinking, or at least one rather like it, is the main cause of resistance to the metaphysics we are trying to advocate. So I will argue for the inappropriateness of any such line of thinking.

The universe or, as we may say somewhat artfully, the universe entire is very different indeed from anything else there is, or ever may be. For the universe entire is, of necessity, more inclusive than anything else and, indeed, is absolutely all-encompassing. As it is distinguished from all else by this feature, there is nothing else required to guarantee its existence. In particular, we do not need any distinctness, or boundary conditions, required for at least many lesser objects, perhaps for all.13

In the case of such lesser objects as require some such broadly construed boundary conditions, and perhaps all of them do, how are the conditions to be fulfilled positively? Suppose that the object is concrete and not infinitesimal. So it has concrete parts that are so related as to constitute it, but not any other object. So each such object has, for a plausible suggestion, a special cohesive unity that holds between all of its parts, in virtue of which they are all of its parts and in virtue of which it is just that object, none other. An example: The stars in our galaxy are united, via mutual spatial and (other) causal relations; these unifying relations distinguish the galaxy they thus form from the rest of the actual world. So, deriving
from these relations of unity, there is the distinctness required for our galaxy to be a genuine object.\footnote{14}

Because the universe entire is guaranteed unique in any case, there need not be any unity imposed on, or found in, its parts to generate the distinctness for it that, perhaps, every object must have. Even if the universe is wholly concrete, as many nominalists believe, this will be so. Accordingly, when the object of our consideration is the universe entire, we may relax our usual requirements for unity.

9. A SORT OF UNITY FOR A UNIVERSE OF MANY
ISOLATED CONCRETE WORLDS

On a metaphysics of many concrete worlds, the universe entire will not be unified through connecting relations among its main concrete parts. But this does not mean that the universe will not be a unity. For it, or the concrete aspect of it, might be unified in some other way, where connections and dimensional relations are not the unifying factors. But, then, how might such a universe still qualify as a unity?

Being sympathetic with my rationalist project, though not going so far as to believe in it, David Lewis has offered me in conversation a highly appealing answer. Let me try to recount it, develop it a little, and then notice its implications (as Lewis has done) for a metaphysics of (infinitely) many unconnected concrete worlds.

Consider a circle dance with boys and girls partnered one to one. After going through a certain sequence of steps, a dance unit, the boys and girls change partners; perhaps each girl goes one boy in the clockwise direction, each boy then going one girl in the counterclockwise direction. With new partners, the boys and girls go through the dance unit sequence again. And, then, they change partners again in the aforesaid manner, and so on.

Consider three variations of this dance. In the first, each girl dances with all the boys except for two; no girl gets all the way around the circle nor, then, does any boy. On this variation, the dance is, with respect to major elements, \textit{incomplete}. In the second variation, each girl dances with each boy exactly one time; so everyone goes right around the whole circle and then stops. This variation has the dance being relatively \textit{complete}. A third variation has each girl dance with each boy once and, then, dance a second time with each of her first two partners. So everyone goes right around the circle and then some. On this variation, the dance will be \textit{redundant}, in a salient and relevant way. The second variation is, I suggest, more of a unity than either the first or the third: For, unlike the first, it is complete and, unlike the second, it is not redundant.

The unity of just the middle (second) dance will be clear enough, I think, whether the dance is taken as a particular occurrent event (concrete) or whether as an (abstract) choreographic structure. Of course, all three variations must be treated the same with respect to such a further consideration. But that is easily enough accomplished. In such a case, connecting relations—causal, spatial, and temporal—will be alike for the three variations; either they will be present in all or else absent
in all. As far as such relations go, then, the question of unity should receive the same answer in each of the three cases. But, whether such relations are all absent or whether all present, that question receives a different answer for the second variation, a positive answer, than it does for the first and the third. So, for the question of unity, whether related items be concrete or whether abstract, connecting relations are not always crucial. On the contrary, at least for a certain range of cases, the combination of relevant completeness and nonredundancy can make for unity.

Let's consider another example, one that seems more directly concerned with nature itself, indeed with fundamental features of nature. Consider, first, a concrete world with exactly three types of fundamental particles: one type has mass and positive electric charge, one type has mass and negative electric charge, and, finally, one type has no mass and positive electric charge. Consider, next, a world that has each of these three types of basic particles and, also, just one more type: a sort of particle that has no mass and negative electric charge. The second world is, I suggest, more of a unity than is the first, even though there is no relevant difference in connecting relations between the two cases. For the second world, though not the first, is relevantly complete.

Explicitly suppose that each type of particle is instanced an equal number of times, in both of the aforesaid worlds and, thus, in particular in the second, more complete one. Now consider a third world that has, as regards fundamental particles, just the same four types as in the second world. But, unlike in the second world, in this third there are many more particles of the fourth type, with negative electric charge and no mass, than there are of the other types, the numbers for the three others being, again, exactly the same. This world is, it seems to me, less of a unity than is the second world, again despite no relevant difference in any connecting relations. And the reason for this is, it appears, that there are extra, or redundant, particles of the fourth type in this world. Of these three worlds, just the second one has both a relevant completeness along with a relevant lack of redundancy. Because of that, just this second world is (much of) a unity, whereas the first and third worlds are not. Connecting relations for the small concrete items have nothing to say in the matter; but, apparently, a good deal gets said anyway. So, by themselves, the combination of relevant completeness and nonredundancy can make for unity and can do it in what would appear to be quite an extensive range of cases.

Contemplating our main subject, the suggestion is that the universe entire, as a universe (whose concrete aspect is one) of many isolated concrete worlds, is a case in this extensive range. The main relevant elements are the concrete worlds. When will there be a universe that is a unity? When the worlds altogether exhibit completeness, but do not exhibit redundancy. Well, when will that be?

The universe will be complete providing that every way that a world could possibly be is a way that some world is. What are the possibilities here? As far as the details go, I have no way of knowing. But we need not say what they are. To help ensure the wanted completeness, though, we should have a very liberal conception of possibility at work. We need not, I think, allow "situations that are to make true statements that are contradictory." But our range of possibilities, our range of
various worlds, must be enormously abundant; in an old-fashioned word, we need a *plenitude*. So our range of metaphysical possibilities must include, I imagine, many that are quite beyond our own abilities to conceive of in any illuminating way or detail, as well as many that may at times seem mere fabrications of mind-spinning: As a (self-styled) rationalist, I need unity for the universe entire. For this unity, I need an *extremely great infinite variety* of worlds; without so very many qualitatively different worlds, we'll lack completeness and, thus, lack unity.

For unity we need nonredundancy as well, not just completeness. What does this mean for the ultimate case, presently being considered, of the universe entire, with its infinitely many varied worlds? In particular, does it mean that no world has any qualitative duplicate? It would be nice and neat if it did mean that. However, nonredundancy will not yield as much as that, I am afraid, but rather will yield this slightly weaker proposition: Either each world is without qualitative duplicate or else if any world does have at least one duplicate, then each world has as many duplicates as does every other world.

With completeness and nonredundancy thus available, we have a universe entire that is at least something of a unity. Indeed, as suggested in the section just preceding, it might be a unity of the only sort one should ever expect for the universe entire. At any rate, the foregoing considerations do a fair amount, I think, to motivate serious consideration for a metaphysics of infinitely many isolated concrete worlds. But, especially from our rationalistic perspective, some new problems seem to arise.

Suppose that each concrete world had exactly seven duplicates. Then there would be exactly eight worlds of each character. There would be *unity* enough, for there would be completeness along with no relevant redundancy. Still, the universe imagined seems highly *arbitrary*: Why should there be just *eight* worlds of each character, rather than some other number? Our rationalist feelings are repelled by the suggestion of such an eightfold way.

Well, how many worlds are there of each character? The rationalist aspects of my mind find two answers that seem at least somewhat more appealing than any others: one and, at the other extreme, an *infinite* number of each character. The latter answer, infinity, itself raises questions as to what *size* of infinity we have at hand. As this further question appears to find no motivated answer, there seems to be a preference, generated thereby, for the former. In addition, the former answer—no duplicate for any world—might find some adequate indiscernibility argument in its favor, though really good indiscernibility arguments are, I think, very hard to come by. At any rate, all things considered, I hesitantly advocate the answer, *one*. So, I thus advocate a metaphysics of an *extremely* great infinity of mutually isolated concrete worlds, not even one of which is duplicated even once in the universe entire.

10. EMPIRICAL SCIENCE AND METAPHYSICS

The arguments so far presented for our many worlds metaphysics, both rationalist and also analytical, are a priori, either entirely or at least to a very high degree.
Except for purposes of illustration and exposition, (virtually) no appeal is made to our sensory experience. Now, perhaps the matters here treated are, indeed, always best treated by way of some such a priori approach. Given the nature of these matters, that is not implausible. On the other hand, it may be that, instead, certain of these matters should receive a more empirical treatment, a treatment that contains both elements of experience and those of pure reason, and each to a significant degree. Let me try to explain and motivate this mixed, more empirical treatment, and then examine some of its consequences.

Near the beginning of this paper, it will be remembered, I said that any given universal limit on velocities, as it gave absolute universality to some special, particular feature of things, would be arbitrary; it would, indeed, be highly arbitrary, too much so to be tolerated by a rationalist approach to the universe entire. In the spirit of this enquiry, I will stand by this statement, which seems correct from any rationalist approach that is even moderately vigorous or pure. But, then, I went on to say, or at least to imply, that it would be just as arbitrary to have no velocity limit as universal. This is, or is very close to, the position of extreme rationalism. Although this further contention can be made appealing from a rationalist perspective, it does not seem to be required by such a perspective, as was the previous statement. In other words, from a general rationalist point of view, it does not seem, or does not always seem, so highly arbitrary to have no such universal limit as it does to have any given universal limit.

Suppose that this is indeed the case. Then a world where there is no such limit will, other things equal, be a less arbitrary world than a world where there is such a limit, whatever the limit’s particular value. The following question then arises: Which is a less arbitrary universe entire, a universe that contains only a world (or worlds) of the first, less arbitrary sort or a universe that contains that and, besides, all those worlds that are more arbitrary ones? From a purely a priori stance, there is something to be said for each of the two alternatives.

On the one hand, a universe entire that contains even the more arbitrary worlds does not prefer any world to any other one. So on the vastest scale we can (yet) conceive, the universe will not then show any preference. That makes such a universe, with infinitely many concrete worlds, seem less arbitrary than a more restrictive universe entire.

On the other hand, a universe with such arbitrary worlds seems to have all sorts of quirky, mutually isolated brute facts: There’s this world with just this upper limit, and there’s that world with just that one, and there’s nothing grander in the world that displays these two isolated brute facts as various instances of, or outcomes of, some deeper, less quirky reality.

Suppose that the second sort of universe entire contains, as does the first, (infinitely) many concrete worlds but all with no universal velocity limits. Suppose, further, that it contains worlds that have, even as quite fundamental features of them, arbitrary features. For example, suppose that some form of quantum theory governs many of these worlds, as it seems to govern the actual world, so that only certain configurations of “small particles” ever obtain. Other configurations are
never found anyplace in these worlds. Now, a universe entire that contained certain sorts of more arbitrary worlds, say, quantum worlds, but failed to contain other sorts, say, worlds with universal speed limits, would, it seems from a rationalist perspective, clearly be more arbitrary than a universe that excluded no world at all. If this is right, then the dilemmatic question we are facing reduces to another one.

Suppose that there is at least one world that is as free of natural arbitrariness as can be. Vague as my formulation of it is, we will entertain this supposition. Now we may ask: Which is the less arbitrary, a universe entire that contains only such a least arbitrary world, or a universe that has every sort of world there might be, however quirky and peculiar? From a purely rationalist perspective, this question seems impossible to decide.

Now, the case for a universe entire with just a metaphysically best world is helped if it can be shown, a priori, that there is only one world that is least arbitrary. The case for having all worlds is helped if it can be shown, a priori, that there is no uniquely least arbitrary world. But, whether or not either of these alternatives can be argued a priori, such considerations are less than decisive. So it is that, from our rationalist perspective, a priori arguments can take us only so far in the matter of whether there are, in the universe entire, many concrete worlds or only one, the actual world. At least, this is how the question often does appear.

With this appearance before us, the suggestion arises that we import some empirical evidence into our discussion. Conjoined with some appropriate a priori reasoning, perhaps such evidence can point the way toward a rational stance for us in the matter, at least rational from our general rationalist perspective. For this to happen successfully, we must import the evidence quite indirectly. This is, or is very close to, the position of moderate rationalism.

Suppose the world we live in, our actual world, provided us with sensory evidence that did much to support a conception of it as highly unarbitrary. Somewhat specifically, what do I mean by this supposition? I am uncertain. Nonetheless, these may be some illustrative examples: Evidence indicated that the real geometry of our world was Euclidean, so that there was zero curvature to space everywhere; the world seemed to be spatially and temporally infinite in all directions, rather than of some specific finite size and age; matter did not mainly come in three main types of "elementary particles," but only in one type or, perhaps better still, in different numbers of types in different very large regions and eras. I think that you may be getting the idea.

Further suppose that, as more experiments were performed and observations made, they tended to support a conception of our world where it appeared increasingly less arbitrary. According to available evidence, our world seemed, more and more, to be very nearly the metaphysically best, most elegant world. There was, in a phrase, epistemological convergence toward the metaphysically best world.

In such epistemic circumstances, it would be rational, at least from a rationalist perspective, to give credence to the following propositions. First, that our world was the least arbitrary world. And, second, that our world was the only world there was at all.
The rationality of the first of these propositions is, I presume, acceptable enough for such a context. But how do we move from it to get the second as well? Here is an argument that is, I think, suggestive and even appealing, though quite far from being conclusive.

There is an enormous infinity of candidate worlds, or "designs for worlds." There is even a very great infinity of such candidate worlds with a place for intelligent, philosophical beings. In this latter great infinity, the number of least arbitrary candidates, only one, is very small in comparison to the number of those more arbitrary than the minimum. Now, if all of these candidates were successful, it would be highly unlikely that we should find ourselves in the least arbitrary one. But, we are assuming, that is just the sort of world in which we are. So it is highly unlikely that they are all successful. We accept the very likely idea that is the negation.

Furthermore, it would be more arbitrary for some and not all of such (more arbitrary) candidates to be successful than it would be for none of them to be. So, on our perspective, and given that evidence, it would be rational to accept the idea that our world, the (minimally arbitrary) actual world, is the only world in the universe entire.

We may perhaps agree that in the face of certain "favorably convergent" evidence, and given our rationalist perspective, it would be rational to accept a metaphysics where the actual world is the only world and to reject our metaphysics of many concrete worlds. On the other side of the coin, we may then also agree that in the face of very different evidence, which supported a conception of our actual world as a very quirky, highly arbitrary world, the reverse would be rational: At least from our rationalist perspective, we may then accept our metaphysics of infinitely many concrete worlds and reject a metaphysics of the actual world as the only concrete world. Or, at the least, in such an evidential situation, it would be rational for our rationalist to take many worlds metaphysics very seriously and to be somewhat doubtful about the more ordinary view. This is (a modest form of) moderate rationalism.

As in the previous sections, the material so far presented in this one is purely (or almost purely) a priori argument. What we have newly done so far is to add some a priori epistemological arguments, concerning how a rationalist might best interpret various sorts of evidence, to an a priori metaphysics already in place. Let's now inject some empirical evidence itself into the mix of our available considerations.

Well, then, what is the available empirical evidence, and what does it indicate about the actual world? As empirical science presents it to us, is the world we live in, the world of which we are a part, is this a world notable for its lack of natural arbitrariness? Far from it, the actual world, our evidence seems to indicate, is full of all sorts of fundamental arbitrary features, quirks that seem both universal for the world and absolutely brute. The particular universal limit on velocities in our world is just one conspicuous example. Another is the apparent ultimate, universal validity of quantum physics. A third is the tripartite division of most matter. And so on, and so forth.
According to available evidence, and to such a theory of our actual world as the evidence encourages, the actual world has nowhere near the lack of arbitrariness that rationalist intuitions find most tolerable. To satisfy the rationalist approach, our evidence tells us, we must look beyond the reaches of our actual space and time, beyond our actual causal network. For there to be a minimum of arbitrariness in the universe entire, indeed anything anywhere near a minimum, we might best understand the universe as including, not only the actual world, but infinitely many other concrete worlds as well.

There are other options, of course. Perhaps most conspicuously, there is this: Our available evidence is, at this time, badly misleading. Almost as conspicuous is this: Our scientists are insufficiently imaginative to articulate an intellectually satisfying cosmology, one much more elegant than any now available, that even our present evidence supports. Such options as these are not highly irrational. And they do hold out the hope for a universe entire whose concrete parts are all part of one vast causal, dimensional network, all satisfyingly interconnected. (The question arises: When, even if perhaps not now, would we have enough evidence about the world around us, and about our ability at theory formation, to make these options appear as dogmas, and rightly so?) But, just as these options are now worth at least our serious consideration, so, too, is our hypothesized metaphysics of many concrete worlds.

11. THE TWO FORMS OF RATIONALISM AND THE ANALYTICAL APPROACH

We have just explored a form of rationalism that is rather open to empirical evidence, even while it constrains interpretation of such evidence. This moderate rationalism strikes a nice balance, I think, between respect for intuitions of reason and respect for sensory experience. For that balance, we must pay a price.

Extreme rationalism, unlike moderate rationalism, will always work hand in hand with the analytic motivation for many concrete worlds. No matter what the empirical evidence, such an extreme view runs, it can have no bearing on the question of the structure of the universe entire. Rather, it can only inform the inhabitants of any given world, one of infinitely many, as to the features of their world; empirical evidence just helps them learn which of all the worlds is their world.

On this more rigid view, it is supposed that, no matter what the empirical evidence, the least arbitrary universe is (the) one where every world that can possibly be is a world that does exist. So, with extreme rationalism, all the worlds are there in any case. So a real model is always available for a Lewis-type treatment of our (superficially) mysterious beliefs. Extreme rationalism, then, is guaranteed to work hand in hand with the analytical approach to many concrete worlds.

With a moderate rationalism, the analytically wanted worlds won't always be available: In certain evidential situations, we do well to suppose that they are not. For moderate rationalism, there is no guarantee of partnership with the analytical motivation. That is the price of this more flexible form of rationalism.
Is this price exorbitant; or is the empirically open form of rationalism at least the equal of, and maybe superior to, the form that is guaranteed to coincide with our analytical motivation? This question is, I believe, a difficult one to answer, even in a mildly satisfactory way. But, fortunately for present purposes, we need not address this difficult question.

The reason for this happy state of affairs is, of course, pretty obvious: For us, such evidence as would threaten a partnership between moderate rationalism and the analytical motivation is utterly hypothetical. Our actual evidence poses no such threat at all. For there is precious little in our available experience to indicate that our world is the metaphysically best world that there is, and there is much to indicate that, on the contrary, it is highly arbitrary in various fundamental respects.

Perhaps in any case whatsoever, but certainly given our actual experience, a metaphysics of infinitely many isolated concrete worlds is a view to be taken very seriously. To be sure, such a view has its unattractive aspects. But so, too, does any serious alternative position of which we are aware.¹⁸

Notes

3. There may be some special exceptions to this that science recognizes. But my point does not depend on whether or not that is so.
4. Lewis has published a very large body of work developing this view. One good place to look for a statement of this metaphysics is in his book Counterfactuals (Oxford, 1973), especially on pp. 84-91.
6. This idea of “world-bound individuals” wants convincing argument. In a recent paper, “Individuation by Acquaintance and by Stipulation,” Philosophical Review 92 (1983), Lewis offers an argument for the idea from his analytical approach. The argument is on pp. 21-24. Now, even discounting the small gap in the reasoning that Lewis points out in his footnote 15, I find the argument less than fully convincing, only somewhat persuasive. In conversation, Dana Dellibovi has suggested an argument for this idea from the rationalist approach. But that argument, too, leaves something to be desired. For now, I will adopt this idea as a working assumption. It makes for a more elegant system, and I know of nothing wrong with it.
8. The philosophical literature contains ever so many criticisms of Lewis’s analyses. A couple of prominent examples, fairly representative of the lot, are Alvin Plantinga’s “Transworld Identity or World-bound Individuals?” in Milton Munitz, ed., Logic and Ontology (New York, 1973) and Robert Adams’s “Theories of Actuality” in Nous 8 (1974). I believe, but am not certain, that Lewis defends his analyses adequately against such objections, especially in various of the postscripts in his Philosophical Papers, vol. 1 (Oxford, 1983), and that his treatment is also well defended by others, such as Allen Hazen in his “Counterpart-theoretic Semantics for Modal Logic,” Journal of Philosophy 76 (1979).
10. For a prominent example, see the paper by Robert Adams cited in note 8.
11. See the postscripts in his *Philosophical Papers*, vol. 1, especially the postscripts to "Anselm and Actuality."

12. For example, see Lewis's *Counterfactuals*, especially pp. 88-91.

13. As I must do for the remark to stand, I use the terms of difference in a very lenient manner. So, I regard as distinct two overlapping objects. Indeed, if a certain bronze statue is one thing and a piece of bronze in exactly the same space at the same time is another, then, in my sense of 'distinct', each of those objects is distinct from the other.

14. I take seriously the view that what counts as an object is relative to the context in which it is claimed that a candidate is an object, and that part of the context is the perhaps temporary interests of the speaker or of some assumed audience. So what is an object might be interest-relative. Even if that is indeed the case, the present points remain unaffected.

15. On Lewis's analytic approach, a way for a thing to be just is a thing that is that way. So a way for a world to be just is a world that is that way. For the *analytical approach*, the sentence "Every way that a world could possibly be is a way that some world is" will express a tautology, a proposition that will hold true even if there is only one (concrete) world or even none at all. *Relative to that approach*, such an apparently useful sentence will not, in fact, allow us to express what we want to express, namely, the relevantly *plenitudinous* character of the group of concrete worlds.

Both the analytic approach and also the rationalist approach require a plenitude of concrete worlds, an enormous infinity of various concrete worlds. It is also important to an advocate of either approach that he be able to express this required plenitude. This *problem of expressing the plenitude* was raised by Peter Van Inwagen and sharpened to this present form by Lewis.

A tautology will not express the required plenitude properly, nor will it express anything of much metaphysical interest. So, what are we to do. As rationalists, our problem is not acute because we can give up our partnership with the analytic approach. Then we can express our plenitude by taking possibilities, including "designs for possible worlds," as appropriate abstract structures. Then we can say: Every possibility for a world, or every design for a possible world, is realized by at least one concrete world. But, as advocates of a metaphysics of many concrete worlds, we rationalists hope that we do not have to give up this partnership.

For the analytical approach, the problem is an acute one. The matter may not be one of do or die; after all, at least in philosophy, no problems for views have an absolutely crucial bearing. But this is a very serious problem for the analytical approach.

16. At the very outset, the answer *none* also seems appealing. But given the existence of the actual world, that answer is soon excluded. As we are given that, we ignore this appeal.

17. Inconclusive as this argument is, it is something. In contrast, the analytical approach seems to give no way at all for motivating any answer to this question of qualitatively identical worlds. Perhaps that is why Lewis does not advocate any position on this question. Though it is not wanted without some supporting argument, some position on this question is wanted.

18. For very many of the thoughts that help to shape this paper, I am greatly indebted to David Lewis. Anyone who has read from the paper's beginning to this point would be apt to think my debt to him is a very large one; it is even larger than one would be apt to think.

For useful ideas and suggestions, I am also indebted to Dana Delibovi, Allen Hazen, Thomas Nagel, John Richardson, and, especially, Peter Van Inwagen.