

How the Modalities Come into the World

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Abstract The modalities come into the world by being projections or objectivizations of our epistemic constitution. Thus this paper is a statement of Humean projectivism. In fact, it goes beyond Simon Blackburn's version. It is also designed as a comprehensive counter-program to David Lewis' program of Humean supervenience. In detail, the paper explains: (1) Already the basic fact that the world is a world of *states of affairs* is due to the nature of our epistemic states. (2) Objects (and properties and relations), which figure in states of affairs and which embody *metaphysical modality*, are constitutable by their essential properties and in fact constituted by us according to our ontological policies. (3) What the *facts* are, to which *the correspondence notion of truth* refers, is determined by applying an epistemic or pragmatic notion of truth to the world. (4) *Causation* is a specific objectivization of our conditional beliefs. (5) *Nomicity* is a 'habit of belief' (Ramsey), a specific way of generalizing epistemic attitudes. This covers the basic metaphysical and natural modalities. The paper attempts to convey that talking of projection or objectivization is not just imagery, but a constructively realizable program.

1 Introduction

In this paper I will develop various threads of thought just so far as to make intelligible how they connect to form a far-reaching unified program of what is called projectivism (although this is an unhappy, misleading term, as I am going to emphasize). Something like this is usually not done in papers, which should rather have specific points and detailed arguments. Sometimes, though, such programmatic overviews can be very useful. They make things visible that do not get into

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perspective in the usual papers, and they condense things which authors and readers are too lazy to unfold in a long book. This is also the purpose of this paper.

An embarrassing consequence of this programmatic character is that I will very often refer to my own writings (which are better embedded in the existing literature). I apologize in advance. However, perhaps one or the other reader will take this paper as a useful guide to those other writings.

The question I would like to address is, in a nutshell: where do the modalities come from? Modalities like metaphysical necessity, causation, nomicity, counterfactualty, probability and maybe more? We talk of them and make use of them everywhere, in everyday life and in all of the sciences. They seem very familiar. However, their nature is discussed only in philosophy; they are one of the few proprieties of philosophy; and they immediately aim at the very heart of theoretical philosophy. For, they are deeply mysterious. They seem to belong to the world, but they are not before our eyes. They seem to refer to other possibilities, but other possibilities are nothing we can experience. So, how can they be *in* the world, as they seem to be?

I will suggest that we read those modalities into the world; they are projections or objectivizations of our epistemic modalities or attitudes, which we can and do understand very well. This is not a novel suggestion. It has forcefully entered the philosophical scene with David Hume and is since lingering in various forms of idealism, which sometimes pompously indulge in their revolutionary attitude and sometimes pretend to be quite innocent, like quasi-realism as propagated by Blackburn (1993). Sure, projectivism is no less of a mystery; doubts are more than justified. What I would like to convey is that projectivism is more far-reaching than usually thought in analytic philosophy, that it thereby acquires greater coherence, and that it can indeed be carried out in constructive detail, which dissolves its metaphorical appearance and the appertaining doubts. I cannot demonstrate the constructive detail in this paper, but the feasibility of doing so should at least become plausible.

My intentions may become more intelligible through the contrast with those of David Lewis. He had the same urge of not leaving the modalities unexplained. However, he favored a metaphysical explanation by designing his comprehensive program of Humean supervenience, which entails that all modal facts supervene on non-modal facts.¹ I think his program fails. Not just because it can ultimately not be carried to completion; one gets into fatal trouble with objective probabilities.² Rather because it is misguided right from the start. What I would like to present is an even more embracing program, giving epistemology its dues (which I find grossly underrated in Lewis' program).

Let me set out our issue in more vivid terms. Here we are, in our flats or countries or, if we slightly enlarge the environment, in our universe, the maximal space-time-like extension we belong to. In a sense, this is all there is. Well, in another sense, there are all the other possible worlds, as Lewis has claimed and I concur. If there

¹ Lewis first envisaged Humean supervenience in Lewis (1980) and fully laid it out in the introduction of Lewis (1986a, b).

² He sensed the trouble already in Lewis (1980). He thought to have found a way to overcome it in Lewis (1994). This way was often criticized. My own criticism is contained in Spohn (2010), which may also serve as a survey of the relevant discussion.

are possible objects, and there certainly are—I could have had a daughter, though I don't—then there also are possible objects with a maximal space-time-like extension, i.e., Lewisian possible worlds, or *universes*, as I shall call them. Lewis only erred in their status. Everybody followed him in calling them metaphysically possible worlds. This was not only to say that they are metaphysically possible objects; of course, they are. Rather, the label should suggest that they are well suited for accounting for metaphysical necessity and possibility. This, however, seems wrong to me. The actual universe is our most comprehensive object of experience, though we don't know which one it is. It might be any of the possible universes, and we learn to exclude more and more of them. Thus the universes are possible objects of our experience, they are our *epistemic* possibilities!³

So, here is our universe. It is just one big, indeed maximal concrete object. However, the world is not just one big unstructured object. It is full of concrete objects. The objects have properties, they stand in relations, and thus they form states of affairs, some of which obtain. That is, the world is a world of facts. As Wittgenstein said: “Die Welt ist alles, was der Fall ist.” Again, there is not only the actual world in this sense; the actual objects might have had other properties, and other things might have existed, in short: other facts might have been the case. So, Wittgensteinian possible worlds are totalities of facts, or *totalities*, for short. And then they are not just totalities of ordinary facts; they seem to harbor modal facts as well, such as that I am necessarily human and presently look at my computer screen the light rays of which reach my eyes with nomic necessity and cause me to wonder what I am about to write here.

However, totalities belong to an ontological category entirely different from universes. Universes are concrete objects, i.e., objects with a spatiotemporal extension, whereas totalities are very complex states of affairs or collections thereof. The fundamental question is: How do we get from the one to the other? This is not a trivial matter; it rather is an enormous step that hides all our epistemological and metaphysical mysteries. It is in this step where we project our epistemic constitution into the world and thereby read the structure of a totality of facts into a universe. This is quite a Kantian idea. If you like, you may equate the actual universe with Kant's noumenal world and the actual totality with Kant's phenomenal world. This equation is apt in several ways. But it is also inapt in other ways, and so I shall not further dwell upon it.

I would like to divide this one enormous step into five still very large steps.

Step 1: Why at all states of affairs? This, I will claim, is already a projection of our epistemic constitution.

Step 2: How do objects enter states of affairs? I will explain that the notion of an object is already a modal notion, since it is tied up with the notion of an essential property. In this way, I am attached to a thorough-going essentialism. And I will explain that basically it is we who say what the essential properties of an object are and thus which objects enter into states of affairs.

Step 3: Some states of affairs are facts, and others aren't. This is the basis of the correspondence notion of truth or its deflationary descendants. Sometimes,

³ I have more fully argued for this relocation of Lewisian universes in Spohn (2016).

correspondistic truth is also called an alethic modality. In my view it hides, or anticipates, the fruits of our search for truth in the epistemologically more pertinent pragmatic sense of truth.

Step 4: Here I will address, *pars pro toto*, one or maybe even *the* fundamental natural modality, namely causality, though only in a paradigmatic way indicating how it might fit into the overall projectivistic picture.

Step 5: Finally, I will suggest that nomicity, another basic natural modality, can and should be integrated in this picture as well. This should suffice for displaying the power of the projectivistic program, although it could be extended, I think, to the other natural modalities.

2 Step 1: Why at all States of Affairs?

This is our first issue. However, in this step I will only give half of the answer: why at all the *structure* of states of affairs? The idea will be to argue that propositions (= mental contents or contents of belief, but \neq states of affairs) already have the structure of states of affairs. Only in the second step will this structure be filled with ontological content in order to arrive at full-blown states of affairs.

To begin with, what are states of affairs? A simple state of affairs consists in a given object having a certain property or in a sequence of objects standing in a certain relation. And then there are complex states of affairs, which are Boolean combinations of simple ones. The question is: Why is it so natural, indeed entirely inescapable to conceive of the world in a Wittgensteinian way, i.e., as a collection, in fact a totality of states of affairs? How else could we conceive of it? One may indulge into an extravagant ontology, e.g., in an ontology of tropes. But it only assumes a novel kind of object, which, though, form states of affairs again, by being similar and coinstantiated, etc.⁴ There does not seem to be any alternative to states of affairs.

One may say that this is just the basic structure of the world, something we have to start from as a brute fact. Maybe; but this is only to concede that there is no further answer. Another common and obvious response is that this structure of the world is a projection of the structure of our language. Sentences are basically structured in subject and predicate, or noun phrase and verbal phrase. We cannot help but thinking in terms of our language, and hence we cannot but endow the world with this structure. However, this leaves the basic structure of language as unexplained as the structure of the world before. At this point, Brandom (1994, chap. 6) digs more deeply by arguing within his inferentialist semantics that there must be expressions with a symmetric inferential role and expressions with a non-symmetric role, and that this distinction coincides with that between subjects and predicates or singular and general terms. I can't assess this argument here, but I find the criticism it has met quite well taken.⁵

One may finally say: epistemology is the key that accounts for both, the structure of language and the structure of the world. I entirely agree. Yet, how would this

⁴ For an excellent overview over trope theory see Maurin (2013).

⁵ For critical discussions see, e.g., McCullagh (2006) and Kremer (2010).

work? A quite popular suggestion is this: contents of belief are propositions, and propositions have a conceptual structure and basically decompose into concept and individual concept.⁶ Then, however, the answer is as problematic as before and tends to reversely project the structure of sentences into the structure of propositions.

My point will be that the epistemological answer can be carried one illuminating step further. I shall try to explain it as succinctly as possible:

Another most common characterization of propositions is that they are simply truth conditions, i.e., sets of possible worlds. Such sets are unstructured and hence quite unlike states of affairs. If this is to be our epistemological starting point, it is hard to see how our explanatory strategy could carry us from such propositions to states of affairs. However, we well know that this characterization is insufficient. Egocentric attitudes or indexical beliefs cannot be accounted for in this way. Their representation requires a more liberal understanding of propositions, according to which they are sets of centered worlds consisting of a world w and a center, which in turn consists of a subject s (=I) and a time t (=now).⁷ This is a step into the right direction.

It is little recognized, though, that this still won't do. Propositions are commonly defined as sets of epistemic possibilities. However, an epistemic possibility is not just a centered world; we need to add a possibly infinite sequence of objects. The places of that sequence have various labels: mental objects, intentional objects, files, or addresses. They have quite an elusive existence; that's why they are often rejected. Apparently, though, we can't avoid assuming them; that's why they are also often taken for granted. But what's the argument in their favor? The usual arguments I know are of a more or less explicit linguistic nature.⁸ Then, however, the present dialectic strategy does no better than the direct assumption of structured propositions, which I mentioned above. In my view, however, there is also a purely epistemological argument on behalf of amending epistemic possibilities by a sequence of objects. Very roughly, it runs as follows.⁹

Objects are given to us under a mode of presentation according to Frege; we have only knowledge by description of them, says Russell. If that were so, if objects were epistemically represented by definite descriptions, we could stick to the first narrow sense of propositions as sets of centered worlds. However, our concepts and the propositional structure generated by them may be more or less fine-grained. And the crucial point is that the descriptivistic picture is bound to presuppose a certain level of granularity. A larger set of concepts and thus a more fine-grained propositional

⁶ I am referring to the so-called theory of structured propositions, as put forward, e.g., by Bealer (1982) and Cresswell (1985).

⁷ This is how Lewis (1979) proposed to account for the points raised by Castañeda (1966) and Perry (1979). This account may well be called standard by now.

⁸ The linguistic pioneers of these intentional objects or files were Heim (1982) and Kamp (1981), and their explicit goal is to adequately deal with the behavior of pronouns. Perry (1980) is a philosophical argument in their favor, an early one within analytic philosophy; it is, I find, again of a more linguistic nature. Barwise and Perry (1983) have proposed to deal with these problems and phenomena with their so-called situation semantics. Their situations are also more fine-grained than the unstructured propositions considered first, but they offer a different form of fine-graining than I am suggesting here. As far as I see, the two methods of fine-graining could be combined.

⁹ My most detailed presentation of this argument may be found in Spohn (2009b), which is my third attempt to adequately state it since 1994.

structure may provide you with a unique definite description for the object you believe in, whereas a smaller set and a coarse-grained propositional structure doesn't; that is, your belief could not be represented in a coarse-grained structure. Thereby, the descriptivistic picture violates what I have called the *invariance principle*. This is a basic principle of philosophical psychology and says that our rational static and dynamic descriptions and laws of propositional attitudes in general and epistemic attitudes in particular should be stated in a form that is invariant under coarse- and fine-graining of the propositional structure underlying those attitudes (just as the laws of motion should be Galilean invariant in classical mechanics, i.e., the same in all inertial frames).¹⁰

Let me use a very simple and familiar example: You vaguely remember and thus believe that Kurt Gödel was a mathematician. Any conceptual structure able to represent this belief must at least contain the concept of a mathematician and an individual concept of Kurt Gödel. The invariance principle then entails that any conceptual structure containing these two concepts should be able to represent your epistemic dealings with the proposition that Kurt Gödel was a mathematician. The descriptivist picture violates this, since it requires enriching the conceptual structure until it contains a definite description for Kurt Gödel you believe in. No such thing is needed according to the more complex epistemic possibilities proposed above. In their representation, you possess an individual concept of Kurt Gödel simply by having a mental file or address for him, one place in that possibly infinite sequence of objects amending an epistemic possibility. And thus only the latter representation conforms to the invariance principle.

If we accept this conclusion, how would an epistemic possibility in your belief set look in this example? It would be a quadruple (if we neglect the infinity of addresses) that consists of a world w conforming to your beliefs about how the world is, a center s and t in w conforming to your beliefs about yourself and your present situation in the world, and an object d in w that conforms to your beliefs about Kurt Gödel (i.e., is a mathematician in w , is related to you in the way how you know about Gödel, and whatever else you associate with Gödel). This need not be Kurt Gödel himself; after all, you will not be able to identify Kurt Gödel in this world, let alone under all possible circumstances. Moreover, d need not be the only object in w conforming to your conception of Kurt Gödel. The object d' in w might do so as well, and then that epistemic possibility with d' instead of d would be in your belief set as well.

This illustrates these more fine-grained epistemic possibilities. At the same time, it raises the question why the existential closure of such fine-grained possibilities is not good enough. Why does it not suffice in our example to require that the world w is such as to contain *some* object like d conforming to your conception of Kurt Gödel (which need not be unique)? This would spare us separately listing the mental objects or addresses in epistemic possibilities.¹¹

¹⁰ I have first explicitly stated this principle in Spohn (2009b, p. 357). The first place, though, where I found it considered and (almost) realized, albeit not explicitly formulated is in Savage (1954, sect. 5.5) where he discussed how decision situations can be equivalently represented in, as he put it, grand worlds and small worlds.

¹¹ This idea relates to the so-called E-type account of pronouns; cf. Zimmermann (1999).

This idea would indeed be good enough for a purely static account of belief. However, as I argue in Spohn (2009b, p. 346ff), it is not good enough for an account of the dynamics of belief. The argument can be dramatized by the familiar twin stories. It turns out then that your dynamics of belief concerning such hardly distinguishable twins cannot be adequately represented within the descriptivist picture using only centered worlds as epistemic possibilities, whereas it can be adequately represented with the epistemic possibilities amended by mental objects. So, one might say that it is ultimately the dynamics of belief that enforces the amended representation.

Still, the core of those dramatized arguments is again the above-mentioned invariance principle, which has other fruitful applications besides the present one in epistemology, decision theory, and the theory of causation.¹²

Clearly, this topic would deserve a much fuller treatment. I am also aware that Kant (1781/87, B 274-279) seemed to aim at a similar conclusion when arguing for the concurrency of self-consciousness and object awareness in his refutation of idealism. I have no idea, though, how Kant's argument may be related to the contemporary discussion I am alluding to. Franz Brentano definitely had similar aims. Again, though, I am not sure whether he can be said to have proved or only correctly claimed the existence of intentional objects.¹³ I feel that this is a field where contemporary analytic philosophy and its historical predecessors are still insufficiently integrated.

Be this as it may, if the above argument can be made good, then epistemic possibilities are rather like models in the model-theoretic sense,¹⁴ and propositions, the objects of belief, are not assumed, but proved to be structurally like states of affairs. As announced, this answers half of the leading question of the first step. At least we have the right structure.

3 Step 2: Whence Objects?

Still, propositions in this sense *are not* states of affairs. The latter are composed of objects, properties, and relations. However, concepts are not properties or relations, and intentional objects are not real objects; and not even possible objects; they are only epistemic placeholders for real or possible objects. So, we need to fill the places in the amended propositional structure with real or possible objects and with properties and relations in order to arrive at states of affairs. I will only discuss how objects, whether actual or possible, get into the picture. I think, though, that a

¹² As mentioned, these more detailed arguments are presented in Spohn (2009b). They explain also why I am not satisfied by that E-type account of pronouns. The other applications of the invariance principle are explained there as well.

¹³ See, e.g., Brentano (1874, p. 115ff). His intentionality thesis is deeply connected, though not easily related to the contemporary discussion.

¹⁴ A model is a domain of objects and a set of properties and relations in this domain. This is essentially the same as an epistemic possibility, which, as indicated, consists of a sequence of objects and a world, in which these objects have such and such properties and are so and so related.

similar, correlative account may be given of properties and relations. So, what are objects?

With this question we turn to the second step, the constitution of objects. I do not want to say that they are our epistemic projection; this would be the wrong metaphor. However, in my view it is we who cut up the one huge universe into pieces and read objects into it. How can I think so?

To begin with, we are very good in recognizing and identifying objects. Some animals are so, too, at least within their environment. However, this restriction certainly applies to us as well; we often fail to recognize people in foreign environments. Still, there is a crucial difference between animals and us. Like us, animals have the notion of qualitative identity, i.e., of falling under the same concept; this is all that it is needed for more or less reliable recognition. Like us, animals may also have mental files.¹⁵ However, only we humans have the notion of numerical identity, i.e., of identity proper and thus only we have the notion of an object proper. Animals don't; I don't see how they could.¹⁶ As Quine reminded us: no entity without identity. It's all very fine with discovering more and more evolutionary continuities. However, neither must one overlook the fundamental differences. And this is indeed a fundamental difference between animals and men.

What, though, is numerical identity? Quine's saying really meant: no entity without identity conditions. Some philosophers seem to allow that objects have haecceities or thisnesses, non-properties, as it were, which secure the object's individuality. I confess, I do not understand haecceities: they are an utter mystery.¹⁷ What remains is to accept some version of Leibniz' principle of the identity of indiscernibles. Two numerically different objects must differ in at least one property they have.

Over which kind of properties do we quantify here? Properties deriving from identity, like being identical with me, must be excluded. Otherwise we would presuppose what we intend to explain.¹⁸ One might also conceive of haecceities as properties that trivially cope with the task of individuation. However, this does not render them less mysterious. So, only proper properties, as I shall say, can be allowed. We well know that qualitative properties¹⁹ are not enough; in this sense there always are different, but indistinguishable objects. We must also allow proper relational properties. Those might also consist in spatiotemporal relations. And then, it seems, Leibniz' principle is easily satisfied.

However, and this is crucial, we must also exclude contingent properties. They are welcome for identification, but not for individuation or identity conditions. The problem is that there might be two different objects to which exactly the same properties and relations actually apply. There is me. Let's suppose we are roughly

¹⁵ This is actually a good question. I am not aware that it has been discussed.

¹⁶ We may certainly ascribe *de re* attitudes to animals. But we do this with our ontology, not that of the animals. The lessons of Quine (1968) hold all the more in this case.

¹⁷ I fully share the criticism of Adams (1979) and take myself to be a metaphysical anti-haecceitist in the sense of Fine (2005, p. 30f), though without the actualist inclinations of Adams and Fine.

¹⁸ See also Fine (2005, p. 180f) for a criticism of this recourse to identity properties, as he calls them.

¹⁹ One may draw a subtle distinction between qualitative and intrinsic properties. However, we need not decide here.

clear about my identity conditions. But there is also two-handed me, who is me with essentially two hands and who ceases to exist as soon as I lose a hand, whereas I cease to exist only when I die. Let's hope that I will never lose a hand. Thus, me and two-handed me actually occupy the same space-time-region and have actually all properties and relations in common. The only difference is that I have two hands contingently and two-handed me has two hands essentially.

I conclude that the identity conditions of an object are given by its essential, possibly relational proper properties. Two different objects must differ in one of those properties. For instance, I am essentially human and uniquely procreated from this egg of my mother and this sperm of my father (i.e., if monozygotic twins had emerged from the sperm and the egg, none of them would have been me). No other possible object has exactly this relational essence; two-handed me has a richer essence. Spatiotemporal relations may or may not be essential. They are not essential for continuants like me (well, I could not have been conceived much earlier or later than I have actually been conceived; but afterwards I could be almost anywhere). By contrast, spatiotemporal relations may be essential for occurrents like events. What then, e.g., about the impoverished world considered by Black (1952), which contains nothing but two qualitatively indistinguishable balls? Do they move? Hard to say without introducing absolute space. However, even if there is no qualitative difference, each one is distinguished by essentially being some distance away from the other. Or so I would say.²⁰

I am well aware that I am treating here complex and difficult issues in an inadmissibly brief way.²¹ However, whatever the details, we must acknowledge the point that the identity of an object is bound up with its essence, the conjunction of its essential properties, and this is the basis of all our talk about metaphysical modality.²² And given this, we must ask: where does the distinction between essential and accidental properties come from?

Basically, I don't think we can find it in nature; it's not just there and waits for being discovered by us. We find a lot of properties instantiated in nature, but not whether they are essential or accidental. This distinction is fabricated by us. We tell which properties are essential for an object and thereby individuate or constitute that object in the first place. We can do it willfully, as I just demonstrated it by constituting two-handed me. But for the most part we simply connect up with ordinary language, which enshrines the ontological wisdom of our forefathers. Still, this means that the distinction depends on our linguistic conventions.

The point is obscured, but at the same time substantially deepened by what I call *Putnam's insight*.²³ The insight is this: Prima facie it is clearly wrong what I just said. Sometimes we do discover the nature or essence of objects and of kinds. It was a discovery that Venus is a planet and that water is (constituted by) H₂O. Or more

²⁰ Cf. my discussion of the 'Duality' in Spohn (2007, p. 117f).

²¹ I have discussed these issues somewhat more thoroughly in Spohn (2007, 2016). However, even that discussion is entirely insufficient in view of the myriad of ensuing ontological problems. A broader discussion may be found, e.g., in Mackie (2006).

²² Here, I entirely agree with Fine (1994).

²³ Cf. also Spohn (2014a), where I describe Putnam's insight in more detail.

generally, we discover that certain things belong to certain sortals. And don't we thereby discover part of their essence? Yes, certainly; as Kripke (1972) has emphasized, there are metaphysical necessities a posteriori. Putnam (1975, in particular p. 229ff), though, described more clearly than others that it is still our convention to use our term "water" as a natural kind term, which heavily restricts the kind of essence we might find; this essence is given by that theoretical same_L ("same liquid") relation (Putnam 1975, p. 232), whatever it turns out to be relative to how the world is. However, we might as well have used the term "water" as we use the term "fire", where the superficial properties seem to be the essential ones. We call some phenomena fire even if there is no oxidization going on; fire is just a flamy appearance of light.

In other words: our essentiality conventions need not completely fix the essence of objects or kinds, they can also leave room for empirical discovery. The latter clouds the conventional character, but does not make it vanish. On the other hand, it means that we may not know precisely which objects we have constituted, even if we can name and refer to them. If you don't know my essence, you don't know, in a sense, who I am. Indeed, if the above description of my essence is correct, it is profoundly a posteriori, and even I don't know it in a strict sense. This point will interlace the present step with the next step about a posteriori truth.

The fact that the constitution of objects is conventional is not to say that it is arbitrary. I cannot take any collection of properties and assume *the* object that has precisely those properties essentially; I cannot simply constitute *the* golden mountain as a concrete object by declaring these two properties to be its only essential properties. You may think that the golden mountain makes sense as an incomplete object. However, I do not understand what an incomplete object is; possible objects are not incomplete.²⁴

I confess I am not clear about the formal rules of object constitution, whether absolute in fully specifying all essential properties or only relative in respecting Putnam's insight. Neither am I aware that they have been deeply investigated, at least within the essentialistic framework presupposed by me; as far as I see, this is a part of the essentialistic doctrine that still needs elaboration—something that would truly deserve the Kantian label "logic of objects".

One should notice, though, that the conventionality of object constitution does in no way harm the objectivity of the objects constituted. One must beware of modal confusions. Of course, the objects do not only exist when constituted; they also exist unconstituted; there are sundry of objects which are constitutable, as it were, but have never been constituted, have never been found worth attending by anyone. Surely, if I am pressed to give examples, I would first have to constitute them, as I did with two-handed me. However, two-handed me existed before I started talking of it. One must not make the mistake that our constitution of objects would be in any way essential to them. They would also exist if we never existed and never constituted them—unless, of course, we have produced them in the ordinary sense as we do with artifacts.

²⁴ See Parsons (1980) for an opposing view.

The picture that emerges from those remarks and that I wish to promote is this: There is the actual universe, or any other possible universe. The actual universe is full of constitutable objects, all of which actually exist. Which they are depends (i) on the actual universe, of course, (ii) on those rules of absolute or relative constitutability, which I called severely underexplored, and (iii) on the concepts that we find applicable in the actual universe. Because of (iii) the constitutable objects may depend on us, though we should not speculate now about the limits of concept formation. They do not depend on us because of (ii); those rules appear to be a matter of the logic of constitution. And they definitely do not depend on which of them we actually constitute. When we constitute objects or fix what their essential properties are to be, we do not create them in any sense, however weird; this would be the wrong idea. We rather make a choice from that preexisting vast offer of constitutable objects. And all of this applies just as well to all the other possible objects in other possible worlds.

However, what *we* do or contribute is that we approach the actual universe with the entire matrix of object individuation, identity, and metaphysical modality so paradigmatically explored by Quine. We do so because we have the very epistemological structure laid out in the first step, which needs to be filled by objects, by objects with an identity and hence, as explained, with essential properties. This derives from our epistemic condition. In other words, what comes from us is the general practice of individuating objects with all its ramifications. What does no longer depend on us is how the world responds to this practice. It answers by supplying a plethora of constitutable objects, whether real or only possible, all of them equipped with their individuating essences. That's the upshot of my picture.²⁵

This leaves the issue how we choose to constitute objects from that vast offer of constitutable objects. This is not an issue of the formal rules of constitution. It rather is a matter of our ontological policies. It would indeed be most interesting to investigate why we constitute the objects and kinds in the way we do and not in any other way. By all means, we do not find out about this by doing physics, by exploring the nature of things ever more deeply. I am not fond of evolutionary explanations, either, though they may be illuminating. Rather we have to ponder the rationality behind our essentiality conventions. Why do we constitute ordinary objects rather than their stages? Why rather enduring than perduring objects?²⁶ Why natural kinds? I am not at all clear about that rationality. Again, I am not aware that it has been well explored in terms of the rationality of ontological policy; this seems to be another open flank of the essentialistic doctrine. Maybe those policies are somehow anchored in our explanatory policies. If plausible, this suggestion would certainly need a lot of spelling out.

I mostly talked about objects and sometimes turned to natural kinds for exemplification. As I said, I assume that a similar correlative account can be given for properties and relations. The basic notion for all this is that of a property being

²⁵ In the previous paragraphs I am indebted to Ralf Busse, who better understood my thoughts than I myself. His penetrating remarks helped me state my picture more clearly.

²⁶ See Lewis (1986a, p. 202ff, 217ff) for this distinction and a surprising pleading in favor of perduring objects (which, however, is consistent given his thorough-going mereological picture of ontological matters).

essential for an object or another property. This metaphysical modality is involved already in ordinary objects, properties, relations, and states of affairs. By fixing absolutely what is essential for what, or by only setting relative ranges for essentiality to be filled by the universe, we read metaphysical modality into the universe and thus generate all sorts of possible states of affairs. This concludes my second step and thus also my first step. The first step provided only the structure of states of affairs, and now the second step filled the structure with content, with real objects and, potentially, with properties and relations.

4 Step 3: Whence Facts?

Some states of affairs obtain, that is, are facts. More precisely, none of the states of affairs about non-actual, merely possible objects are (non-modal) facts, but, in some way of counting, half of the states of affairs about actual objects are facts. How, though, do some states of affairs come to be facts? This is the third step I want to consider.

Well, obviously this depends on how the world *is*, at least insofar as contingent states of affairs are involved. If the world is conceived here as a Wittgensteinian world, as a totality, the issue is trivialized. A state of affairs is a fact relative to a totality if and only if it is contained in the totality, which is just an algebraically closed collection of states of affairs.²⁷ And it is a fact simpliciter if it is a fact relative to the actual totality. If we thus have the facts, we can proceed to all the platitudes of the correspondence theory of truth and call beliefs, sentences, and utterances true if they correspond to the facts. These are platitudes, basically because we use the very same words in the sentences and utterances as in describing the beliefs and the facts.

However, this is clearly not an account of how some states of affairs come to be facts. A totality is a totality of facts and thus presupposes such an account. So, if the facts depend on how the world is, we should rather conceive of the world as a universe, a Lewisian world. But what is a fact relative to a universe, what is truth relative to a concrete object such as a universe? This cannot be correspondence truth. Lewis did not seem to be aware of this problem,²⁸ and neither did those working in his paradigm. However, there is a real problem.²⁹ It is none less than: how is a universe transformed into a totality of facts? This is a grand issue. Taking

²⁷ “Algebraically closed” is intentionally vague. First, it means that a totality is deductively closed, i.e., a complete prime filter. Secondly, it should mean that a totality is closed under the rules of object constitution. This is indeterminate since, as mentioned, these rules are insufficiently cleared up.

²⁸ Lewis (2001) favors a redundancy theory of truth attributing all the work of a truth theory to the ‘redundancy biconditionals’. And he criticizes the correspondence theory. However, our terminologies are simply at cross-purposes. For me, facts are nothing but obtaining states of affairs, whereas for Lewis facts are true propositions in one version of the correspondence theory and quite selective obtaining states of affairs in another version. Moreover, the biconditionals he attributes to the redundancy theory are already expressed in my view in the classic quote of Aristotle usually taken as the origin of the correspondence theory: “To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true” (*Metaphysics* 1011b25). Still, even if our terminologies diverge, my criticism of Lewis seems legitimate.

²⁹ I have more extensively raised and discussed this problem in Spohn (2016).

Lewis' comprehensive perspective is a necessary, but not a sufficient condition for dealing with that issue.

Since correspondence truth is of no help at this point, we have to refer, I think, to an alternative notion of truth, namely the pragmatic notion, which appeals to Peirce's idea of a limit of inquiry. I said that a universe is the most comprehensive object of experience for us. We know very well what it is to explore the world or parts of it; we do it everyday. So, we also have an idea of what it could mean to drive such an exploration to a limit where absolutely everything is explored. Of course, this limit is forbiddingly counterfactual and idealized. We cannot time-travel, we can actually look only at tiny regions of the universe, also because we live only for a minute time. We do not have the cognitive capacities to record and process all the data. And we cannot observe the world and leave it unchanged at the same time. Moreover, even if we should have reached the limit, we would never know that we actually did so. Still, I think that Peirce's limit of inquiry is not entirely ill conceived.

The pragmatic theory of truth then says that what we believe in the ideal limit of inquiry is true.³⁰ Or as Putnam says: the ideal theory must be true.³¹ In the ideal limit there is no experience and no consideration left, there are no more reasons to be found that could falsify and change our judgments and beliefs. We are used to say that our beliefs aim at truth. I find this to be quite a mysterious statement. In any case, there is an ineliminable gap between belief and truth; our a posteriori beliefs may always turn out to be false. Only in the ideal limit of inquiry this gap finally closes. It is in this way that we can understand the statement that our beliefs aim at truth.

One may tend to discount all of this as nothing but nice metaphor. Sure, the pragmatic theory of truth is usually presented in this much too informal way. However, I am convinced that it can be developed so as to meet theoretical standards. The basic point is that one needs a precise and general account of the change of our epistemic states, an account of the dynamic laws of belief. There are a number of such accounts, though I find mine particularly suited in the present context.³² And once one has such an account, one can more precisely speculate about the limit of inquiry, about where our epistemic course leads to in the end. I am quite optimistic that we can thereby arrive at a proper independent and substantial theory of truth.³³

And I emphasize: an independent theory of truth. There are two theories of truth: an ontological one—the correspondence theory—, and an epistemic one—the pragmatic theory. A standard objection against the pragmatic theory and its appeal to the limit of inquiry or to the ideal theory is that the ideal theory is, of course, the true theory, true in an antecedently understood, presumably correspondistic sense. This would indeed defeat the entire project. However, it would mean to put the cart before the horse. No, we can partially characterize that ideal, by referring to epistemic rationality, which governs our epistemic states and their dynamics. And

³⁰ Perhaps best expressed in Peirce (1878, sect. IV).

³¹ Cf. in particular Putnam (1980, 1981, chap. 3).

³² Mine is extensively presented in Spohn (2012). Several others could be mentioned. The much older theory of Bayesian learning is very familiar. Formal learning theory, as developed in Kelly (1996) and further developed Kelly (2008), is another prominent example with special emphasis on limit statements.

³³ In my Lakatos lecture Spohn (2013) I have expanded on this outlook.

reversely, epistemic rationality is substantiated through its entanglement with pragmatic truth. All this must and can be developed without any overt or hidden reference to the correspondence theory of truth.³⁴

A final important point was already foreshadowed in the previous step: In the limit of inquiry not only our beliefs are guaranteed to be true; we also know then what the states of affairs and what the facts are. If we completely or absolutely specify the identity conditions of an object right away, then we know from the start which object we are thinking about; mathematical objects are the paradigm cases. If, however, our essentiality conventions leave the identity conditions partly to nature in a relative way, they can be known only a posteriori and hence for sure only in the limit of inquiry. For instance, if you say such a harmless thing as that having the parents I have belongs to my identity conditions, this makes for pretty demanding conditions. In order to determine my identity, one has to go far back in earth history, maybe back to the big bang, and far ahead towards the limit of inquiry. Similar remarks apply to properties and relations. Do we know the essence of water? It seems so, and in an ordinary sense of “know” we certainly do. Again, though, we can be sure in the most demanding sense only in the limit (if we knew that we have reached it).

This explains how actual or only possible states of affairs, at least concerning contingent actual objects, are guaranteed to be determined only in the limit of inquiry. But then, of course, it is also determined which of the states of affairs are facts. And thus it is by carrying our epistemological enterprise concerning a given universe to the ideal limit that we transform this universe into a corresponding totality of facts. This is the upshot of my story so far.³⁵

Let me recapitulate: Why at all the structure of states of affairs? Because this reflects the structure of mental contents, i.e., of epistemic states. And the latter structure must be as it is not in order to circularly capture the structure of states of affairs, but because the dynamics of our epistemic states must be described in this way under the constraints of the invariance principle. Now the structure of states of affairs must be furnished with objects, properties and relations. They are not just there; we impose the distinction of essential and contingent properties, our matrix of individuation and identity conditions on the world and thus find a vast array of constitutable objects. Why we constitute only some of them in the way we do should be somehow justified by our ontological policies. Thus we get states of affairs involving constituted and also unconstituted, though constitutable objects. Some of them are facts. But in order to determine the facts we have to carry our epistemic enterprise to completion and to appeal to the pragmatic theory of truth, which is profoundly entangled with our normative standards of epistemic rationality.

So, each step essentially depends on our epistemic constitution, in various, though always constructively explicable ways. This holds already for the non-modal part of the world in the sense of a totality of non-modal facts, i.e., facts that are not yet *about* modality. All simple states of affairs are non-modal in this restricted

³⁴ So far, my most specific elaboration of this entanglement is found in Spohn (2012, sect. 17.3). As I say there, a lot remains to be done, though.

³⁵ In Spohn (2009a, b, p. 9ff) I have introduced this transformation as a guiding idea, which I chose to call the EO-map, the epistemological-ontological map. In Spohn (2016) I have described and discussed it in more detail. In fact, though, it remains a research program.

sense; they do not state something to be in some sense necessarily so. Still, as explained, already simple states of affairs presuppose a fully developed metaphysical modality, for which I have tried to indicate the epistemic foundations.

Recall, moreover, my initial remark that I want to unfold an alternative program to Lewis' program of Humean supervenience. Now one can see that my program is even more embracing. The issues addressed so far are not dealt with or somehow taken for granted in Lewis' program. It is only now, in my continuation, that our programs have the same focus, although they continue to proceed in fundamentally different ways.

5 Step 4: Causation

I am convinced that the projectivistic strategy extends to modal facts in the ordinary sense, i.e., to the so-called natural modalities, which are also Lewis' subject matter. Let me paradigmatically demonstrate this with two of those modalities, causality and nomicity, which are perhaps the most important examples.

Concerning causality, our modern predicament starts with David Hume and his two theories of causation, none of which, by the way, is the counterfactual theory, as suggested by Lewis (1973b) right in the first paragraphs. The first is the well-known regularity of causation, where causal necessity boils down to constant conjunction. The second might be called Hume's associationist theory, according to which the effect is associated with the cause. Here, causal necessity is nothing but a customary transition or a habit of thought and thus an idea of reflexion, in Hume's terms.³⁶ An idea of reflexion—this cannot be overemphasized! Kant's so-called Copernican turn originated from here.

Hume was ambiguous between the two theories and diminished their difference. Indeed, when he lets a critic object that the associationist theory is crazy, he swiftly resorts to the regularity theory. In fact, though, the difference could not be larger. The regularity theory is an objective ontological account of causation, and the associationist theory is a subjective epistemic account according to which causal relations depend on our associations. How the theories relate is not easy to say.³⁷ I think that Hume took the associationist theory to be conceptually basic and that he intended to explain the shape of our associations by the regularities, so that the associations agree with the regularities in the end. Thus he derived the regularity theory from the associationist theory.

³⁶ Here is a crucial quote from Hume (1739, p. 165): "The idea of necessity arises from some impression. There is no impression convey'd by our senses, which can give rise to that idea. It must, therefore, be deriv'd from some internal impression, or impression of reflexion. There is no internal impression, which has any relation to the present business, but that propensity, which custom produces, to pass from an object to the idea of its usual attendant. This therefore is the essence of necessity. Upon the whole, necessity is something, that exists in the mind, not in objects".

³⁷ Cf., e.g., Blackburn (1990). Interestingly, Mackie (1974) opens his book with this issue, and Beebe (2006) dedicates a full book to attempting to clear up the confusion.

The regularity theory has met so many objections that it appears untenable.³⁸ And Hume's account of associations is definitely much too crude. Still I am convinced that Hume's scheme is basically right. Psychologists built a lot on Hume's theory of associations. As a philosopher I have a more rationalistic picture of them. I understand them as reasons; if I associate *B* with *A*, *A* is for me a theoretical or epistemic reason for *B*.³⁹ And *A* is a reason for *B* if *A* speaks for *B*, or makes *B* more credible, that is, if *B* is more credible or less incredible given *A* than given non-*A*. This is my explication, the *positive relevance notion* of a reason. It is entirely subjective; what speaks for what is determined by my subjective epistemic state or, more specifically, by my conditional degrees of belief. I find the current debate about the nature of reasons quite confusing and quite confused, and I think that most of the other notions of a reason that are around can be captured on the basis of this subjective positive relevance notion and its various intersubjectivizations and objectivizations. That's another issue, though.⁴⁰

Now, causes are not just reasons, as my brief presentation of Hume might have suggested; whatever the confusing connection between reasons and causes, it is not that close. However, causes are a special kind of reasons, indeed a special kind of conditional reasons. More precisely, according to my explication, *A* is a *direct cause* of *B* if and only if *A* is a reason for *B* given the entire history up to *B* without *A*. And *causation*, i.e., direct or indirect causation, is the transitive closure of direct causation.⁴¹ Since reasons are relative to an epistemic state, causation is so, too—just as in Hume's associationist theory. A deep, but vague intuition concerning causation is that *A* is a cause of *B* just in case if I wiggle with *A*, i.e., intervene on *A*, *B* thereby wiggles as well. My explication agrees—it only interprets that wiggling epistemically.⁴²

The main reason for my subjective turn is that in my view all objectivistic accounts of causation run into unsolvable difficulties. A nice case in point is symmetric causal overdetermination. In my hotel room the telephone and my mobile phone ring at the same time in order to wake me up at seven a.m. Each of the phones would have sufficed to wake me up. So, this is a simple case of symmetric overdetermination. Such cases are ubiquitous. The basic problem of objectivistic

³⁸ Its most clever and up-to-date defense is found in the extensive work of Michael Baumgartner. See, e.g., Baumgartner (2013).

³⁹ I am not sure how defensible this is as an interpretation of Hume. The rationality of the associations is doubtful in Hume's texts. However, it definitely makes a lot of sense reading Hume in this way.

⁴⁰ For instance, the view that normative reasons have to be facts (which gives them some objectivity) has come to dominate practical philosophy in the last 20 years. By contrast, philosophy of science has vigorously discussed the nature of scientific explanation in the 1950s and 1960s, and one lesson I have learnt from this old discussion is that the factivity of the notion of explanation is not an important issue. The crucial issue is the nature of the relation between explanans and explanandum. Practical philosophy has again to learn this lesson, it seems.

⁴¹ These explications are thoroughly explained and defended in Spohn (2012, ch. 14). I have discussed those issues with Nancy Cartwright for more than 35 years. I am well aware that she has forcefully attacked, from Cartwright (1983) onwards, the common presupposition of the large debate to which I intend to contribute, namely that causation would be a single notion amenable to a uniform analysis such as mine or any other. See also Cartwright (1999).

⁴² Cf. Spohn (2012, p. 360ff).

theories with such cases is this: Somehow, a cause should make a difference to its effect; it should help bringing about the effect. Each of the phones makes it true, by itself, that I wake up. However, in the presence of the other phone, each phone has no force; it cannot make my waking up true twice over. This makes no sense; nothing can be truer than true. Hence none of the phones can be objectively positively relevant to my waking up in the presence of the other. Objectivistic theories are quite creative in trying to overcome this difficulty, but I find them unconvincing.⁴³ With subjectivistic theories the difficulty vanishes immediately. Given that both phones ring you can more strongly expect me to wake up than given that only one rings; you expect it twice as much, as it were. Epistemically, hence, one phone can be positively relevant to my waking up even in the presence of the other.⁴⁴

So, our subjectivistic starting point, the above explication, has much to recommend it. The crucial point, though, is that we are not stuck with it. The important paper of Putnam (1983) expresses its main claim in its title: “Why reason can’t be naturalized.” He was right. In my somewhat different terms, reasons can’t be objectivized. That is, although unconditional beliefs can obviously be true or false, there is no general way to assign truth-values to conditional beliefs, and this applies all the more to the reason relation, which is based on a comparison of conditional degrees of belief.

However, Putnam extended his claim to causes, which he took to be of the same mold as reasons. Indeed, they are of the same mold according to my explication. Still he was wrong. As explained, causal judgments involve very special conditional beliefs: given the entire history up to t , what do I believe to happen at t ? These special conditional beliefs *can* be assigned truth-values after all, in a rigorous formal construction and under certain restrictions, which plausibly, but not necessarily obtain. I take those restrictions to be objectivization conditions of causal beliefs, which tend to be confused with defining characteristics of causation.⁴⁵

The details of this objectivization story tend to become complicated—and are open to debate, of course. However, if the story is successful, it offers a constructive way of explaining how causal statements are true, not subjectively relative to an epistemic state, but objectively relative to the actual world. In this way—pretty much the way Hume had envisaged—there are causal states of affairs and indeed causal facts in the world, according to which cause and effect are epistemically related in the above way *by objectivable conditional beliefs*. One may call this a projection of the relevant conditional beliefs into causal facts. However, the metaphor should not conceal that it very much depends on the world whether and how the projection works. In any case, what counts is the above-mentioned objectivization theory behind the metaphor.

⁴³ In particular, the solution proposed by Halpern and Pearl (2005, p. 853ff) won’t do; the condition AC2(b) of their definition 3.1 does not sufficiently counteract the liberality of the condition AC2(a).

⁴⁴ I discuss this and other examples more extensively in Spohn (2012, sect. 14.5 and 14.13), thereby trying to justify my claim that objectivistic accounts of causation run into unsolvable difficulties.

⁴⁵ I am referring here to the objectivization theory developed in Spohn (2012, ch. 15). It is a philosophically most significant supplement of ranking theory.

6 Step 5: Nomicity

Let me turn to my final step. Already Hume's objective side, his regularity theory of causation, was inherently ambiguous. It might refer to regularities in general or specifically to laws. I didn't find a hint that Hume was aware of this ambiguity. Taking the regularity theory as referring to laws instead of mere regularities is a bit more plausible. However, it would have to explain then what laws are over and above being regularities. This has turned out to be a most intricate problem; nomicity or lawlikeness is another modality that is hard to understand.⁴⁶ This is the last topic I would like to take up here. And again, I will conclude that nomicity is a covertly epistemic modality.

To begin with, laws are general. Indeed, their characteristic seems to be that they are in some sense essentially general. However, this sense turned out to be difficult to specify. Laws obviously make modal claims. They apply not only to actual, but to all possible situations. Well, not to all possible situations whatsoever, but only to situations that are possible according to the laws. This conceptual circle is too short to be informative.

Another idea is that laws are essentially systematic.⁴⁷ This is the so-called best system analysis of Lewis (1973a, p. 73), to which he adhered henceforth, e.g., in Lewis (1994), and which seems quite fashionable nowadays. Lewis takes it from Frank Ramsey, others find it in John Stuart Mill.⁴⁸ It says that a general statement is a law if it is part of a set of true statements that strikes an optimal balance between strength and simplicity. If you say little, it is easy to stay simple, and if you say a lot, it tends to become complicated. The best system and the laws in it must find the right balance here.

I don't like this for various reasons. First, it can hardly be called an analysis. We have a perfect theory of strength, namely logic, but a poor theory of simplicity and no account of that balance at all. Second, it puts the cart before the horse. The usual procedure has been first to try to explicate lawlikeness and then to define a law as a true lawlike statement. Lewis, by contrast, explains laws directly and has no good account of lawlikeness, which we were hoping for. He could only say that a lawlike sentence is one that is a law, i.e., belongs to the best system in some possible world. However, we would like to say, e.g., that Kepler's laws are lawlike, even though they are false. And it seems that we are not committed thereby to fancy a world in which they are true and belong to the best system there (this might not be so easy). Third, this alleged analysis has not offered any continuity from laws to *ceteris paribus* laws, which I take to be desirable.⁴⁹ Fourth, it's quite mysterious how this optimal balance between strength and simplicity induces the further essential, though soft features of laws: namely that they support counterfactuals, have

⁴⁶ See Hempel (1948, Part III), the classic paper where this problem was set on the agenda of philosophy of science.

⁴⁷ For an up-to-date introduction into the topic see Psillos (2002, part II).

⁴⁸ Cf. Psillos (2002, p. 148ff).

⁴⁹ This is also important for Lange (2000, chap. 6), and I try to satisfy this desideratum in Spohn (2012, ch. 13, 2014b).

explanatory force, and are projectible—features that accidental generalizations miss. Lewis (1994, p. 478f) only notes that his best-system analysis is no less clear than those features, but he does not say how it entails them. It seems that he simply ennoble the best system by these features. Fifth, note that with the criterion of simplicity our subjective standards creep in into nomicity. I don't criticize this. But upright realists shouldn't like this. Lewis doesn't like it either and hopes that nature is sufficiently kind so that nomicity does in effect not depend on our subjective standards of simplicity, at least within reasonable bounds.⁵⁰ The hope may be satisfied, vague as it is, but the entire maneuver looks pretty hopeless.

Finally, it is not the best interpretation of Frank Ramsey. Ramsey has changed his mind,⁵¹ and more characteristic quotes point into a different direction. My favorite quote is from Ramsey (1929): “Many sentences express cognitive attitudes without being propositions; and the difference between saying yes or no to them is not the difference between saying yes and no to a proposition” (p. 135f). And “... laws are not either” (p. 150), namely propositions. Rather: “The general belief consists in (a) A general enunciation, (b) A habit of singular belief” (p. 136). Ramsey sounds strikingly like an updated Hume. A habit of belief—this is a most remarkable characterization. I understand it as saying that one invariably and undeviatingly believes in the next instantiation of the law, however the previous instances have turned out.

Let's look at an abstract example. All situations or objects of type *S* display pattern *P*; in short: all *S* are *P*. This is a regularity, and it might be a law. Ramsey's idea in my interpretation is that I *treat* this as a law if I believe that all *S* are *P* (“a general enunciation”) and if I believe that the next *S* and all further *S* will be *P*, independently of whether or not the past *S* have been *P* (“a habit of singular belief”). It will immediately be objected that this sounds like a very silly and dogmatic attitude. I will turn to this objection, but let me first finish my explanation. In Spohn (2012, sect. 12.4) I call this “habit of belief” a persistent attitude towards that regularity. A shaky attitude, by contrast, would be discouraged by negative instances more or less quickly or even immediately. This, however, is characteristic of accidental regularities. Note that this persistence, or epistemic independence of past instances, cannot be captured in a proposition, as Ramsey has pointed out; it is a feature of my epistemic state, more precisely, of my conditional beliefs, the objectivization of which were stated above to be problematic. I also call that persistent attitude a subjective law. Note how diametrically this runs against Popper (1934, chap. IV), who made falsifiability the cornerstone of scientific laws. I take persistence to be the mark of laws, which seems roughly the opposite of falsifiability.

Again one might complain that the notion of a subjective law is very cryptic, but I will indicate how it can be turned objective. A brief look at de Finetti's philosophy of probability will be very helpful.⁵² A statistical law is what I just called a law, only in probabilistic terms. It says, for instance, that the probability for each throw

⁵⁰ Cf. Lewis (1994, p. 479) for this line of escape.

⁵¹ Lewis (1973, p. 73) admits that Ramsey has done so. Therefore I find it misleading to speak of the Mill-Ramsey-Lewis account of laws.

⁵² Cf. de Finetti (1931, 1937).

of a die showing three, say, is $1/6$, independently of all the other throws. If the probability for a single throw is subjective, we might call this a subjective statistical law. Of course, the intention is to interpret the probability for the single throw and thus the entire law in an objective way. But beware: objective probabilities are a deep mystery as well.

This is also what de Finetti thought. He wanted to talk only of subjective probabilities. And of course, they should not take the form of a statistical law, because subjective probabilities must be able to learn, whereas a statistical law is unable to learn due to the independence of the instances. So, I am about to approach the above objection in probabilistic terms. De Finetti proposed that our subjective probabilities are symmetric in the sense of treating the various instances in the same way. This allows for probabilistic dependence among the single instances and thus for learning. He then proved, in his famous representation theorem, that if the subjective probabilities are symmetric, then, and only then, they are a mixture of statistical laws, indeed a unique mixture. Moreover, by observing the instances our subjective mixture will change and learn and finally converge to the true statistical law.⁵³

I take this to be one of the deepest results in the philosophy of probability. Its lessons reach far beyond probability.⁵⁴ In fact, what I intended to explain concerning nomicity is nothing but a generalization of de Finetti's account to the case of deterministic laws. Probability theory is not suited for this generalization, but ranking theory is. Thereby we arrive at the very same results: If only your ranks, the ranking-theoretic degrees of belief, are distributed symmetrically over the instances, your epistemic state concerning all those instances is a unique mixture of subjective laws in the above sense, and the mixture will change by observing the instances and converge to a unique subjective law.⁵⁵

The final upshot is this: if your attitude towards the single instance can be objectivized so that it can take a truth-value, the subjective law can be objectivized as well, precisely because of the independence of the instances assumed in the law; otherwise this would not be possible. Thereby the subjective law turns into an objective one.⁵⁶ My above account of causation gave an example for the objectivization of our subjective epistemic attitude towards a single case. And so, putting the two accounts together, we finally arrive at objective causal laws, which are simply laws of succession, as Hume has suggested. They state that, whenever the constellation is such and such, this and this will happen; and they state this persistently in the sense explained above.⁵⁷ This is, very roughly, my account of

⁵³ These theorems and the weak additional premises are explained in Humburg (1971) and Link (1980).

⁵⁴ In Spohn (2009, p. 15) I even claimed that this representation theorem is the first instance of so-called diagonalization, which gained much importance in two-dimensional semantics through Stalnaker (1978).

⁵⁵ For precise statements, supplementary assumptions, and proofs, see Spohn (2012, sect. 12.5).

⁵⁶ Cf. Spohn (2012, sect. 15.6).

⁵⁷ One referee suggests that steps 4 and 5 prove to be thoroughly connected at this point. Yes, indeed. That is: What it means to objectivize singular causal relations could be defined without reference to the account of laws indicated. However, in order to arrive at an epistemic state that objectivizes causal relations, one needs to generalize and to find out about objective causal laws. I confess, though, that I don't know how my general de Finettian account of deterministic laws specifically applies to causal laws.

how nomicity results from an objectivization of subjective laws and thus ultimately from epistemic modality.

I am well aware that this is a philosopher's fantasy. However, it's not only philosophy that is taught by the sciences. Conversely, the latter might be more receptive for philosophical ideas than they actually are. In particular, the sciences provide the paradigm examples for laws, but have little insight into their nature. So, we have no choice but developing our own stories; and if they are good and instructive—as I think they are—then it's in the interest of both sides to connect up.

7 Concluding Remark

This was my fifth and last point. Each point was presented in forbidding brevity. However, the projectivistic strategy would be a mystery if it would apply only in an insulated way. It gains plausibility only by getting carried out widely and systematically. I did not apply it to moral matters, which are the other main concern of Blackburn (1993, Part II). But I did apply it broadly within theoretical philosophy: to truth, metaphysical modality, causality, and nomicity. And I could have continued with counterfactuality and probability.⁵⁸ My hope in rushing through this wide range of topics is that thereby the large explanatory potential of the projectivistic strategy and its constructive feasibility in detail has become apparent, perhaps in an even more compelling way precisely through this density.

Did I try to convince you of queer idealistic conceptions? Do I suffer from a deficient sense of reality? I don't believe so. On the contrary, you may even think that I have been much too permissive concerning possible objects and concerning unconstituted, though constitutable objects (like two-handed me). There is only a problem with the projectivistic metaphor. It suggests that there is no projection without a projector. If there had never been a projector, there would have never been a projection and hence never been something projected. However, this causal connotation, though invited by the metaphor, is entirely inappropriate. (This is a general problem with the talk of mind-dependent reality.) Of course, the projected objects and facts, even causal facts, would exist also without anyone doing any projection. This is how our counterfactual talk works. The constitutable objects exist even unconstituted, even if nobody exists to constitute them—just as real numbers exist even if unnamed. And the causal facts obtain, at least insofar as they are accessible to the objectivization procedure indicated, even if there is no epistemic state around to be objectivized. Likewise, the ripe tomato is red, even if nothing like our color perception had ever evolved. It's only that there would be nobody around then to call it red and to conceive of it as red. Let's not raise a new issue, though.⁵⁹ I think that realism is much less vulnerable and more powerful when it acknowledges those projectivistic underpinnings.

⁵⁸ For probability see Spohn (2010) and for counterfactuality see Spohn (2015).

⁵⁹ Which I have dealt with in Spohn (1997).

Acknowledgements I dedicate this paper, just as the lecture from which this paper originated, to my two brothers: to my eldest brother Willfried, who was an eminent scholar of historical sociology, the sociological counterpart of social history, and to my elder brother Herbert, who is a most distinguished mathematical physicist. I also want to express my gratitude to two anonymous referees for suggesting essential clarifications and to Michael De for checking my English.

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