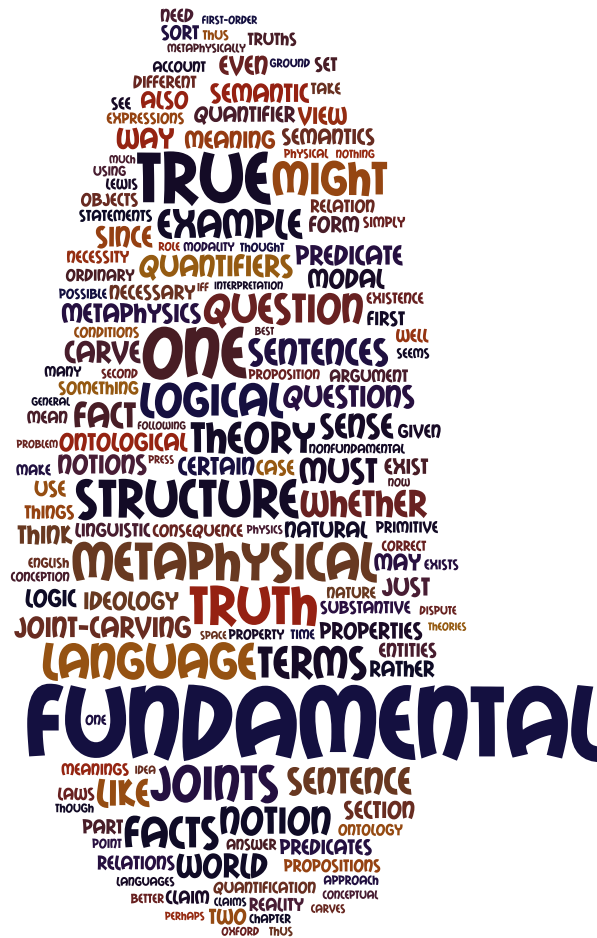


Writing the Book of the World

Theodore Sider



Draft; pagination does not match published version

The central theme of this book is: realism about structure. The world has a distinguished structure, a privileged description. For a representation to be fully successful, truth is not enough; the representation must also use the right concepts, so that its conceptual structure matches reality's structure. There is an objectively correct way to "write the book of the world".

Realism about *predicate* structure is fairly widely accepted. Many—especially those influenced by David Lewis—think that some predicates (like 'green') do a better job than others (like 'grue') at marking objective similarities, carving nature at the joints. But this realism should be extended, beyond predicates, to expressions of other grammatical categories, including logical expressions. Let "there schmexists an F " mean that the property of being an F is expressed by some predicate in some sentence of this book. 'Schmexists' does not carve at the joints; it is to the quantifier 'there exists' as 'grue' is to 'green'. Likewise, the question of joint-carving can be raised for predicate modifiers, sentential connectives, and expressions of other grammatical categories. (Structure is a generalization and extension of Lewisian naturalness.)

I connect structure to fundamentality. The joint-carving notions are the fundamental notions; a fact is fundamental when it is stated in joint-carving terms. A central task of metaphysics has always been to discern the ultimate or fundamental reality underlying the appearances. I think of this task as the investigation of reality's structure.

Questions about which expressions carve at the joints are questions about how much structure reality contains. Whether reality contains causal, or ontological, or modal structure is a matter of whether causal predicates, quantifiers (or names), and modal operators carve at the joints. Such questions lie at the center of metametaphysics. Those who say that questions of ontology are "merely verbal", for example, are best regarded as holding that reality lacks ontological structure. Such deflationary metametaphysical stances are thus themselves metaphysical stances. There is no ametaphysical Archimedean point from which to advance deflationary metametaphysics, since any such metametaphysics is committed to at least this much substantive metaphysics: reality *lacks* a certain sort of structure.

A subsidiary theme is: ideology matters. There is an unfortunate tendency, perhaps encouraged by bad terminology, to psychologize Quine's notion of ideology: to regard a theory's choice of primitive notions—its ideology—as a merely psychological or linguistic or conventional matter (in contrast to the entities it postulates—its ontology—which is part of its objective content). Philosophers reject their opponents' ideology in psychological/semantic terms:

“I don’t understand what you mean by that.” And when introducing their own ideology, the hurdle to be passed is again psychological/semantic: primitive notions must be “intelligible”. But there is a squarely metaphysical issue concerning any proposed piece of ideology (including logical and quasi-logical ideology such as modal operators or second-order quantifiers): does reality contain the requisite structure? If it does, then “intelligibility” in previously “understood” terms is not required for successful reference to and theorizing about that structure, no more in metaphysics than in physics.

A shift of focus from psychological/semantic to metaphysical constraints on ideology is at times liberating for metaphysics, but it also keeps our feet on the ground, by restraining the tendency to evade ontological commitments by adding to ideology. A fundamental theory’s ideology is as much a part of its representational content as its ontology, for it represents the world as having structure corresponding to its primitive expressions. And the world according to an ideologically bloated theory has a vastly more complex structure than the world according to an ideologically leaner theory; such complexity is not to be posited lightly.

Fixating on ontology while ignoring ideology is both too narrow and incautious.¹ It is too narrow because the goal of metaphysics is to give a fundamental description of the world, and doing so requires more than merely saying what there is. It is incautious because it uncritically assumes that quantificational structure is fundamental. If quantificational structure is indeed fundamental (as I think it is), ontology deserves its place in fundamental metaphysics. But if quantificational structure is not fundamental, then ontological inquiry deserves little more attention within fundamental metaphysics than inquiry into the nature of catcher’s mitts.

A final theme is a “pure” conception of metaphysics, free of certain encumbrances. One encumbrance is doing metaphysics primarily in modal terms. Against this, there is a growing consensus that modal notions are too coarse for metaphysics, and that notions in the vicinity of “fundamentality”, “in virtue of”, and the like, should not be understood in modal terms. A second encumbrance is linguistic entanglements. Here too, there is a growing consensus: that it is not so important for metaphysical and linguistic theory to neatly mesh. The fundamental metaphysics underlying a discourse might have a structure quite unlike that suggested by the discourse. Whereas a good linguistic theory must

¹Dorr (2004, section 1) and Schaffer (2009*a*) make related complaints.

fit the suggested structure, good metaphysics must fit the underlying structure.²

This book presented an organizational challenge. Theory-then-applications would have been neatest, but the concept of structure is unfamiliar enough that readability demanded early applications. My compromise was to intermingle. Chapter 1 introduces the concept of structure and describes in a preliminary way how it will be applied. Chapter 2 begins to present the theory, arguing that structure is primitive and objective, and defending an epistemology of structure. Chapters 3–5 turn to applications, showing how structure illuminates explanation and laws, reference, epistemology, physical geometry, substantivity, and metametaphysics. Chapters 6–8 return to theory, arguing that expressions of any grammatical category (not just predicates) can be evaluated for structure, addressing various abstract questions about how structure behaves, and criticizing certain rival concepts (such as truthmaking and ground). Chapters 9–12 return to applications, showing how the metaphysics of four domains—ontology, logic, time, and modality—looks when conceptualized in terms of structure. Chapter 13 concludes with a sketch of a “worldview”: a comprehensive metaphysics cast in terms of structure. As a guide to those who wish to read selectively:

The metaphysics of structure: chapters 1, 2, 6–8;

Applications: chapters 3–5, 9–12;

Metametaphysics: chapters 4–5, 9, and (to a lesser extent) 10–12;

Mix of first-order and meta- metaphysics: chapters 9–13.

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²Kit Fine’s (1994a; 2001) recent work has been especially influential in forging both consensus.

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Finally, it should be obvious how much this book owes to David Lewis. His ideas on natural properties and relations have always seemed to me among his best: powerful, correct, revolutionary yet deeply intuitive.

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Chapter 1

Structure

METAPHYSICS, at bottom, is about the fundamental structure of reality. Not about what's necessarily true. Not about what properties are essential. Not about conceptual analysis. Not about what there is. Structure.

Inquiry into necessity, essence, concepts, or ontology might help to illuminate reality's structure. But the ultimate goal is insight into this structure itself—insight into what the world is like, at the most fundamental level.

1.1 Structure: a first look

Discerning “structure” means discerning patterns. It means figuring out the right categories for describing the world. It means “carving reality at its joints”, to paraphrase Plato. It means inquiring into how the world fundamentally is, as opposed to how we ordinarily speak or think of it.

Consider three objects: two electrons in identical intrinsic states, and a cow. It is the most natural thing in the world to say that the electrons are perfectly similar to each other, and that neither is perfectly similar to the cow. The three objects should be divided into two groups, one containing the electrons, the other containing the cow. The electrons *go together*, and neither goes with the cow.

Or imagine a universe that is entirely full of fluid. A plane divides the universe into two halves, one in which the fluid is uniformly red, the other in which the fluid is uniformly blue (figure 1.1). Now imagine a group of people who encounter this universe, but accord no special status to the dividing blue-red plane. Instead of thinking of the universe as divided into the red and

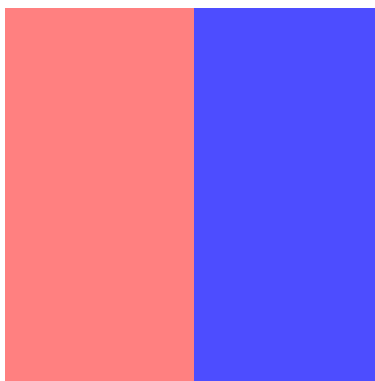


Figure 1.1: The red–blue world

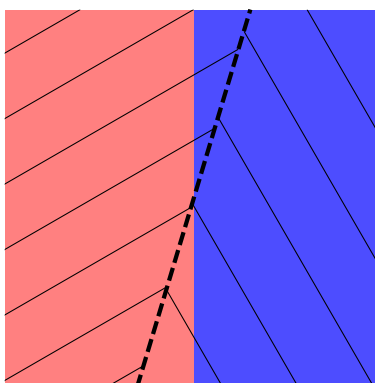


Figure 1.2: Bizarre carving of the red–blue world

blue halves, they think of it as being divided in half by a different plane, marked by the dashed line in figure 1.2. And they do not use predicates for red and blue. Instead, they have a pair of predicates that they apply uniformly within the two regions separated by their dividing plane. These predicates (whose extensions are indicated by diagonal hash lines in the diagram) cut across the predicates ‘red’ and ‘blue’. The regions to the left of the dashed line they call “bred”; the regions to the right they call “rue”.

It is almost irresistible to describe these people as *making a mistake*. But they’re not making a mistake about where the red and blue regions are, since they make no claims about red or blue. And they make no mistakes when they apply their own concepts. The regions that they call “bred” are indeed bred, and the regions they call “rue” are indeed rue. The problem is that they’ve

got the wrong concepts. They're carving the world up incorrectly. By failing to think in terms of the red/blue dividing plane, they are *missing something*. Although their beliefs are true, those beliefs do not match the world's structure.

1.2 Philosophical skepticism about structure

All is well until we encounter a philosopher, who, as usual, asks some uncomfortable questions. Why do the two electrons “go together”, the philosopher wants to know? Yes, they share many features in common: each has 1.602×10^{-19} C charge, 9.109×10^{-31} kg mass, and so on. But there are plenty of features that the electrons do not share. They are in different locations, travel at different velocities, and are parts of different wholes. And why doesn't the cow go together with the electrons? If all three are located in North America, then all three share the feature *being located in North America*. And all three share the feature: *being an electron or a cow*.

The philosopher continues: what is wrong with carving the red–blue world along the diagonal plane? What is wrong with grouping the bred things together and the rue things together? All bred things really are bred; they all share the feature of *being on the left side of the diagonal plane*. One might protest that not all bred things are alike, since some are red and some are blue; but the philosopher will reply that carving the world along the vertical plane is no better on this score. Not all red things are alike, since some are bred and some are rue.

In fact, once we get the hang of the philosopher's way of thinking about “features”, we can see that *any* two objects share infinitely many features, and also differ with respect to infinitely many features. For consider any objects x and y . Where F_x and F_y are any features of x and y , respectively, x and y share the feature: *being either F_x or F_y* . And they share the feature *being either F_x or F_y or 1 kg mass*. And they share the feature *being either F_x or F_y or 2 kg mass*. And so on. So they share infinitely many features. As for the infinitely many features with respect to which they differ, consider:

being F_x , and located at L

being F_x -or-1-kg-mass, and located at L

being F_x -or-2-kg-mass, and located at L

etc.

where L is some location occupied by x but not y . Object x has each of these features; object y lacks each.

The crux is obviously the philosopher's willingness to allow such "features" as *being either an electron or a cow*, and to treat them on a par with features like *being an electron* and *being a cow*. If we had nothing but the philosopher's features to go by, then indeed, we wouldn't be able to make any sense of a "correct" way to group our three objects, or of the electrons being more similar to each other than to the cow. If, on the other hand, we could make a distinction between *genuine* features—features that are fundamental, that carve nature at the joints, whose sharing makes for similarity—and the rest, then we could say what we want. Can we make this distinction?

Concepts and distinctions that resist definition in terms of the popular philosophical ideology of the day tend to be viewed with suspicion. Thus it was that throughout much of the twentieth century, philosophers tended not to speak of genuine features. Quine's extensionalism, for example, which dominated the 1950s and 1960s, allowed only a meager set of concepts to be used in drawing distinctions (roughly, those of first-order logic plus an array of scientific predicates). Noticing the presence of disjunction in the definitions of many philosopher's features, an extensionalist might begin an attempt to characterize genuineness by disqualifying features defined in this way. But what language do we use to evaluate whether a feature is "defined using disjunction"? Speakers of English must use 'or' to define the feature: *being an electron or cow*, but speakers of a language with a primitive predicate for this feature—'blurg', call it—can define the same extension without using 'or'. Indeed, if the language is strange enough, its speakers would need to use 'or' and other logical connectives to say things that in English may be said using simple predicates like 'cow' and 'electron', just as we must use logically complex predicates of English to say what they say using 'blurg'. The extensionalist attempt fails to characterize an appropriately language-independent notion of genuineness.¹

In the 1970s, modality became kosher ideology, and there were renewed attempts to define concepts in the vicinity of structure. For instance, Roderick

¹The paradigm of first-order logic had perhaps the following additional influence. The standard model theory of first-order logic treats the semantic values of (n -place) predicates as subsets of the (n -place Cartesian product of the) domain. Viewed from a purely set-theoretic perspective, the semantic values of the predicates 'is an electron' and 'is an electron or cow' are on a par: each is a subset of the domain.

Chisholm (1976, p. 127) and Jaegwon Kim (1982, pp. 59–60) tried to give a modal definition of the notion of an *intrinsic property*—a property that an object has just by virtue of what it’s like in itself, independently of how it is related to other objects. They proposed, roughly, that a property is intrinsic if and only if it is possibly instantiated by an object that is alone in the world. But this definition was shown to be unacceptable. The property of *being alone in the world*, and the property of *either (being alone in the world and being green) or (not being alone in the world and being blue)*, satisfy the definition but are extrinsic (Lewis, 1983a).

(The 70s’ fixation on modality was doubly unfortunate. Not only are modal tools too crude;² they’re also distant from the subject matter of most of metaphysics. It is needlessly indirect to approach the question of what the world is like by asking what it must be like and what it might have been like.³)

Since the 1980s many philosophers have become comfortable with a richer ideology, one that includes notions in the vicinity of “genuine feature”, “intrinsic property”, and the like. The zeitgeist has been that these notions are legitimate even if they cannot be defined in other terms. Two Davids have led the way.⁴ David Armstrong (1978a,b) used the traditional doctrine of universals to draw the distinction between genuine and nongenuine features. Some predicates, like ‘is an electron’, perhaps, stand for universals, Armstrong said; but others do not: there simply is no universal of “being either a cow or an electron”. Through sheer force of will as much anything, he put realism about genuine features on the map. But as our second David, David Lewis (1983b) showed, Armstrong embedded this insight in a quite independent dialectic: the traditional debate over the existence of universals and their role in a general analysis of predication. According to Lewis, we can incorporate Armstrong’s insight by admitting a notion of “natural properties and relations” (those properties and relations that carve nature at the joints) without thinking of these as universals in the traditional sense, and without taking on the (misguided, according to Lewis) project of giving a general analysis of predication. The notion of a genuine feature was thus freed from unwanted entanglements.

Of course, *everyone* can agree that there is *some* difference between *being an electron* and *being either an electron or a cow*. If nothing else, ordinary English

²On which see, for instance, Fine (1994a); Restall (1996).

³I also suspect that the right account of how the world might have been and must be defers to how the world *is* (chapter 12).

⁴Earlier relevant work includes Quinton (1958); Quine (1969); Putnam (1975d); Bealer (1982, chapter 8).

has a single word for the former attribute. What distinguishes Armstrong and Lewis is that they regard the distinction as objective. Structure, too, is to be understood as objective. There are hard questions about what objectivity amounts to (some of which will be discussed in chapter 4), but the intuitive idea is clear: whether a property, word, or concept⁵ carves at the joints has nothing to do with the place of the concept in human languages, conceptual schemes, biology, or anything like that. Thus “fundamental” (which I use more or less interchangeably with “joint-carving” and “part of reality’s structure”) signifies a metaphysical, rather than conceptual, sort of fundamentality. Humans may need to acquire other concepts first before they grasp joint-carving ones; and conversely, those concepts we acquire first, or most easily, may fail to carve at the joints.

1.3 Structure in metaphysics: a preview

The goal of this book is to push forward the front of realism about structure. I want to expand our conception of structure’s importance, generalize the concept of structure, investigate its nature, use it as the foundation of “metametaphysics”, and reconceptualize metaphysics in terms of it.

The connection to similarity is only the beginning of the importance of the notion of structure. As we will see, structure pops up throughout philosophy, in our thinking about reference, epistemology, spacetime, objectivity, and other matters.

Structure is particularly central to metaphysics. The heart of metaphysics is the question: what is the world ultimately, or fundamentally, like? And fundamentality is a matter of structure: the fundamental facts are those cast in terms that carve at the joints.

The truly central question of metaphysics is that of what is *most* fundamental. So in my terms, we must ask which notions carve *perfectly* at the joints. By using

⁵Subtleties will come later, but to forestall misunderstanding: 1. Structure is a worldly, not conceptual or linguistic, matter (my informal talk of “notion/word/concept *X* carves at the joints” notwithstanding). 2. ‘Structure’ is not a noun; structure is not an entity or stuff (this very sentence, and phrases like “how much structure the world contains”, notwithstanding). 3. ‘Structure’ and its variants are not predicates—not of properties, nor of any other sorts of entities (“charge carves at the joints” notwithstanding). 4. My most basic notion of structure is absolute, although I allow a derivative notion that comes in degrees. 5. Structure includes distinguished monadic features (such as charge), not just relational ones (despite what may be suggested by the term ‘structure’).

‘red’ and ‘blue’, we carve more closely to reality’s joints than do the speakers of the ‘bred’/‘rue’ language. But we do not thereby carve perfectly at the joints; colors are presumably not perfectly fundamental. To carve perfectly, one must use the most fundamental concepts, expressing the facets of reality that underly the colors.

Which concepts are the perfectly fundamental ones? In my view, certain concepts of physics, logic, and mathematics.⁶ But this thesis about structure is not built into the idea of structure, and defending it is not one of the main goals of this book. The great metaphysical disputes concern which theses of this sort are true; my goal is to explain what is at stake in such disputes, not to settle them. Is mentality part of reality’s fundamental structure? (Modal theses in the philosophy of mind, such as psychophysical supervenience, are crude ways of getting at what clearly was the issue all along: whether reality is fundamentally mental.) Do mathematical entities exist, in the fundamental sense of ‘there exist’, and if so, what are the fundamental features of those entities? Do causal or nomic notions have any place in a fundamental description of the world? These are questions about structure.

Metametaphysics—inquiry into the status of metaphysics—will be central in this book. Is the pope (or Robinson Crusoe, or a twelve-year-old boy) a bachelor? Intuitively, the question is merely verbal or conceptual. To answer it, all we need to do is investigate our concept of a bachelor; intuitively, all that is at stake is how we use the word ‘bachelor’. In contrast, the question of whether there is any lithium in a certain region on Mars has nothing to do with word use or concepts; it is *substantive*. This rough and ready notion of substantivity needs to be clarified; after all, the statement that Robinson Crusoe is a bachelor is no more *about* our concept of a bachelor than the statement that there is lithium in the region is about our concept of lithium. Nevertheless, there is a strong intuitive contrast between the two questions.

The opponents of metaphysics (and even some renegade practitioners) tend to regard many metaphysical questions as being—to some extent, anyway—like the question of whether the pope is a bachelor. True believers, on the other hand, tend to think of their favorite metaphysical questions as being substantive, like the question about lithium. In my view, whether a question is substantive—in one important sense of ‘substantive’—depends largely on the extent to which its terms carve at the joints; to the extent, that is, that the question concerns the world’s fundamental structure. The central metametaphysical questions

⁶Plus the concept of structure itself! See section 7.13.

are about *how much structure the world contains*.

Consider two properties:

Being an unmarried male

Being an unmarried adult male eligible for marriage.

It may well be that exactly one of these properties is (determinately) what we mean by ‘bachelor’. So it may be that the question of the pope’s bachelorhood has an answer. But neither of these two properties carves nature at the joints better than the other. The unmarried males don’t go together any more than do the unmarried males eligible for marriage. A linguistic community that used the word ‘bachelor’ for the first property would not be getting at the world’s structure any better than a community that used the word for the second property. And since the pope is an unmarried male who is ineligible for marriage, speakers of the first community speak truly when they say ‘The pope is a bachelor’, whereas speakers of the second community speak truly when they say ‘The pope is not a bachelor’. So, intuitively, the only question facing us is: which sort of linguistic community do *we* inhabit? Which of two equally good ways to talk is *our* way to talk?

The question of whether there is lithium in the region near Mars has a very different status. Suppose that the region does indeed contain lithium. We can imagine a linguistic community that uses the word ‘lithium’ exactly as we do, but with one exception: their word does not apply to the lithium (in our sense of the word) in the region. So ‘There is lithium in the region’ counts as true in our language, and false in theirs. But here the parallel with the previous paragraph ends. The lithium in the region is just like the lithium elsewhere, so the imagined linguistic community fails badly to carve nature at the joints. They fail to group together things that, objectively, go together. The question of whether there is lithium in the region is *not* just a question of which of two equally good ways to talk is *our* way to talk.

Few would deny that the question of the pope’s bachelorhood is insubstantial in a way that the question about lithium is not. But in metaphysics, things are far less clear. Consider questions of ontology, for example. There has been much discussion recently of whether tables and chairs and other composite material objects exist. It is generally common ground in these discussions that there exist subatomic particles that are “arranged tablewise” and “arranged chairwise”; the controversy is over whether there exist in addition tables and chairs that are composed of the particles. Is this really a substantive debate

about the world? Most of the ontologists engaged in the debate think so—or really, presuppose so. But Eli Hirsch, Hilary Putnam, and other “ontological deflationists” have argued that the debate is in some sense merely verbal or conceptual. The “metaontological” question here ultimately boils down, I think, to a question of structure: whether quantificational notions like ‘there exists’ carve at the joints. What the ontological deflationists have in effect been saying is that reality would need fundamental quantificational structure in order for the question of whether there exist tables and chairs to be worth asking, and that this structure is, in fact, missing. I oppose ontological deflationists in chapter 9, but they deserve credit for raising an important and difficult question—a question that is in a way more foundational than the first-order question of what there is.

There are similar foundational questions throughout metaphysics. Do modal concepts carve at the joints (chapter 12)? (Here my answer is *no*; modality is not the core of metaphysics that some take it to be.) Do tensed concepts (chapter 11)? (Again, *no*; but seeing the issue as concerning reality’s temporal joints helps to illuminate what are otherwise extremely perplexing questions.) Do logical concepts (chapter 10)? (Here I say *yes*. Certain debates over the “correct” logic are genuine, and are not linguistic or conceptual; they are as substantive as ontological debates.)

More generally, metaphysicians regularly speak of what is “really” or “genuinely” the case. (Often they feel guilty about it, but don’t know how to stop.) As Kit Fine (2001, 2009) has emphasized, such talk is central to metaphysics, but in dire need of explication. When a nominalist says that there do not *really* exist abstract entities like properties, while granting that frogs share more properties in common with crocodiles than they share with humans, the ‘*really*’ is essential; otherwise she contradicts herself. Those who think that “time is like space” say that there is no “genuine” or “objective” distinction between past, present, and future, but they do not deny that there once were dinosaurs. Again, if ‘genuine’ and ‘objective’ are dropped then the position becomes incoherent. These claims are not merely about what is *true*; they are about what is true at the *fundamental* level.

If the concept of structure is to play this role in metametaphysics, it must be generalized beyond Armstrong’s notion of a universal and Lewis’s notion of natural properties and relations. For many metaphysical questions are not about universals, properties, and relations. The crucial expressions in ontology, logic, and modality do not stand for universals, properties, or relations; these expressions are quantifiers and operators, not predicates. Our conception of

structure, therefore, must allow us to ask, of expressions of any grammatical category, whether they carve at the joints.

Call a language “fundamental” if all of its expressions carve at the joints. Realism about structure leads to realism about fundamental languages. On the generalized conception of structure, in order to be fundamental, it is not enough that a language have the right predicates. It must also have the right logical apparatus. Will a fundamental language contain quantifiers? The sentential connectives of propositional logic? Modal or tense operators? The realist about structure thinks that these questions have objective answers. There is a privileged way to “write the book of the world”.