CONTEMPORARY DEBATES IN

METAPHYSICS

EDITED BY THEODORE SIDER,
JOHN HAWTHORNE AND DEAN W. ZIMMERMAN

Contemporary Debates in Metaphysics

Contemporary Debates in Philosophy

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Contemporary Debates in Metaphysics

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**Theodore Sider, John Hawthorne,
and Dean W. Zimmerman**

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Introduction

Theodore Sider

There is something strange about metaphysics. Two strange things, really, although they are related. Metaphysics asks what the world is like.[1] But the world is a big and varied place. How can one meaningfully ask what apples, planets, galaxies, tables, chairs, air conditioners, computers, works of art, cities, electrons, molecules, people, societies ... are like? The question is hopelessly general and abstract! One would normally ask first what apples are like, and then ask what planets and the rest are like separately. What meaningful questions are there about such a broad and hetero-geneous subject matter? Furthermore, you'd think that you'd need to ask a biologist what apples are like, an astronomer what planets are like, and so on. What can a philosopher contribute?

Let's have a look.

Consider a certain apple. What is it like? Well, it's red, and it's round. But this information doesn't come to us from *philosophy*. We need to *observe* the apple to learn its color and shape.

Consider another thing, Mars. It has iron oxide on its surface, and it is 6.4185×10^{23} kg in mass. This information about Mars, again, isn't something that philosophy can tell us about; we learn it from astronomers.

So far, we have found no philosophical subject matter. But if we abstract from certain details, we find things in common between our two examples; we find a recurring pattern despite the diverse subject matters. Here are the facts we cited:

The apple is red	Mars has iron oxide on its surface
The apple is round	Mars is 6.4185×10^{23} kg in mass

Notice that in each case, an object is said to have a feature. For example, in the first case, the object is the apple, and the feature is *being red*. Philosophers call objects

that have features *particulars*, and they call the features "had" by particulars *properties*. Thus, we have:

The apple   is red   Mars   has iron oxide on its surface
particular property   particular   property

The apple   is round   Mars   is 6.4185×10^{23} kg in mass
particular property   particular   property

In fact, this pattern is quite general. Think of other facts:

Fact	particular	property
This table is broken	the table	*being broken*
Electron *e* is negatively charged	electron *e*	*negative charge*
The stock market crashed	the stock market	*crashing*

The particular-property pattern keeps recurring. It appears that every fact about the world boils down to particulars having properties.[2] So it would seem that the world contains two different sorts of entities: particulars and properties. We have already uncovered a general fact about the world. Just as a scientist establishes generalizations about what the world is like in some limited sphere (for instance that charged particles repel one another or that the planets move in elliptical orbits), we have established a generalization – albeit a much broader and more abstract one – about the world. And we did it without detailed input from the sciences.

Of course, since this is philosophy we are talking about, there is controversy at every turn. The statement that there are two different sorts of objects in the world, particulars and properties, can be challenged. *Nominalists*, for example, believe in particulars, but not in properties. According to a nominalist, there simply is no such thing as the property of being red.

Put that baldly, the statement is misleading. It suggests that nominalists think that there is no such thing as a red object. But nominalists are not *crazy*. They agree that red objects exist; they just deny that *redness* exists.

The nominalist's position can be made clearer by thinking about the sentence 'The apple is red'. The nominalist agrees that the sentence is true. But now, consider the two parts of the sentence: its subject, 'The apple', and its predicate, 'is red'. What the nominalist thinks is that, whereas the subject does stand for an object (namely, the particular in question, the apple), the predicate does *not* stand for an object. The predicate 'is red' is of course *meaningful*; it's just that it doesn't stand for an *object*. Just as a comma is meaningful without standing for an object, predicates can be meaningful without standing for objects. The apple is red, even though there is no such thing as its redness.

We talk *as if* there are lots of things, when really, those things don't exist. We talk, for instance, as if there are such things as holes. We'll say: "Look at the size of that hole in the wall!" "Bring me the piece of cheese with three holes in it." "I can't wear that shirt because there is a hole in it." But surely there aren't *really* such things

as holes, are there? What kind of object would a hole be? Surely what really exist are the physical objects that the holes are "in": walls, pieces of cheese, shirts, and so on. When one of these physical objects has an appropriate shape – namely, a perforated shape – we'll sometimes say that "there is a hole in it." But we don't really mean by this that there literally exists an extra entity, a hole, which is somehow made up of nothingness. The nominalist thinks that all subject-predicate sentences are a bit like sentences about holes. It might seem at first that the predicates refer to entities, but they really don't.

Are nominalists right? Do properties exist or don't they? This is no easy question, and Chris Swoyer and Cian Dorr (chapter 1) come to opposite conclusions on this and related matters. But in this brief look at nominalism, we have at least glimpsed what metaphysicians are after: patterns in apparently diverse phenomena, and generalizations that accurately describe these patterns. This book contains chapters in a number of areas of metaphysics; in each area, the goal is to find generalizations about abstract patterns:

Necessity

Scientists tell us of the laws of nature. Physicists tell us of the laws of physics, for example that like-charged particles must repel one another. Chemists tell us of the laws of chemistry, for example that if methane reacts with oxygen, it must produce carbon dioxide and water. Economists tell us of the laws of economics, for example that when demand increases then prices must increase as well. In each case, we have scientists telling us what *must* happen in certain conditions. What exactly are these laws of nature; what is the status of these "musts"? Laws of society exist because governing bodies have legislated them. But there is no governing body that has legislated the laws of nature. Physicists try to *discover* the laws of physics; they do not create them (chapter 2). And if everything happens as these laws of nature specify, human actions must conform to their dictates. How then can we have free will (chapter 7)? Further, there are other cases of "mustness". Every bachelor must be male; every prime number other than two must be odd. In what does the mustness of these facts consist (chapter 3)?

Time

Objects of all sorts, the objects of physics, chemistry, biology, and other sciences, last over time. This raises many philosophical questions. What does it mean for the *same* object to exist over time? A person at age 50, for instance, is the same person as she was as a child, even though nearly all of the matter that made up her body as a child no longer is with her at age 50. What makes a person the same over time? And indeed, what is it for time to pass at all (chapters 4–6)?

Ontology

Different sciences describe different objects. Physics describes subatomic particles, biology describes organisms, and so on. But must we believe that the objects from each science really exist? Consider organisms, for example. Could we not stick with the physicist's objects, and say that the only objects that really exist are subatomic particles? We could still agree that there are distinctively biological *phenomena*, even though there do not exist distinctively biological *objects*. For even if human organisms

(for example) do not exist, there are nevertheless certain systems of particles that exhibit biological behavior. These are the systems involving particles that one ordinarily thinks of as being *parts* of a single biological organism. Thus, we have very general *ontological* questions (existence questions) about objects with parts (chapter 8). Other ontological questions include the question discussed above of whether properties exist, the question of whether numbers exist, and even the "metaontological" question of what it *means* to investigate whether objects of a certain sort "really" exist (chapter 9).

Within these and other areas of metaphysics, certain themes recur. For example, metaphysicians tend to fall into two camps: those who go around trying to *reduce* phenomena, and those who prefer instead to "leave the world as they found it." Consider the law of nature saying that like-charged particles repel one another. Of one thing we can be sure: the existence of such a law guarantees a *regularity*: everywhere and at any time, every pair of like-charged particles will indeed repel each other. Jonathan Schaffer (chapter 2.2) is a member of the reductionist camp. He wants to say that, roughly, there is nothing more to this law beyond the regularity. The law reduces to the regularity. What the physicists discover is simply that it is *universally true* that every two charged particles in fact repel each other. John W. Carroll disagrees (chapter 2.1); he is from the anti-reductionist camp. According to him, reductionists like Schaffer leave out something crucial. They leave out the *mustness*, the *necessity*, of laws. It doesn't just *happen* to be the case that charged particles repel one another. When you give two particles the same charge, they *must* repel each other. So there's something more to a law than just the fact that objects everywhere act in accordance with the law; you need to add necessity to a regularity to get a law.

Another example: time's passage. We ordinarily think of time as something that "moves". J. J. C. Smart (chapter 5.2) takes a reductionist approach to time's passage. According to him, time is just another dimension like space. And like space, it is not really correct to describe time as moving. What we ordinarily think of as time's passage just arises from the fact that at any given moment in time, we can only remember what has occurred in one direction through time (the direction we call the "past"). But objects in this direction are not "gone." Just as objects that are spatially distant – for example, objects on Mars – are just as real as objects around *here*, so, objects that are temporally distant – for example, dinosaurs – are just as real as objects around *now*. Dean Zimmerman, on the other hand, resists this reduction (chapter 5.1). Our ordinary belief about the matter is correct: time has passed since the time of the dinosaurs, and the dinosaurs are now gone. And this does not just mean that they are far away in time, just as Mars is far away in space. The dinosaurs simply do not *exist*.

A second (and related) recurring theme in metaphysics is the relationship between a scientific outlook and our ordinary beliefs. What science tells us doesn't always fit neatly with our ordinary beliefs about the world. In cases of conflict, should we revise science so that it doesn't conflict with our ordinary beliefs? Should we revise the ordinary beliefs in light of science? Or is it a mistake to think that they conflicted in the first place?

Time's passage again provides an example. The picture of time we get from physicists, especially from Einstein's theories of relativity, is Smart's picture of space-like

time. But where, in this picture, is there room for our ordinary belief that time passes? According to Smart, our ordinary belief must be revised to fit it into the scientific picture, whereas according to Zimmerman, it is the scientific picture that must be revised, or at least augmented.

Or consider the problem of free will and determinism. Science tells us of a world governed by laws of nature. An electron has no choice about where to move; if another charged particle is in its vicinity, it cannot help but be repelled. The laws of nature must be obeyed. But on the face of it, this threatens our ordinary conception of ourselves as having free choices. We *blame* evildoers because we think that their choices were not inevitable; they *freely chose* to do wrong. Robert Kane (chapter 7.1) argues that these two pictures genuinely conflict. If the laws of nature fully determined what each and every object in the world was going to do, then there would be no room for any human freedom. (Fortunately, there is reason to think that the laws of nature that scientists have actually discovered are not quite so restrictive.) Kadri Vihvelin, on the other hand, tries to fit human freedom into the world of science, even a scientific world in which all human behavior is determined (chapter 7.2). But Vihvelin does not think that this calls for a revision of our ordinary beliefs about freedom. (In this way her position is unlike Smart's.) According to Vihvelin, it was a mistake to think that the two world-pictures were in conflict in the first place.

What should we trust when doing metaphysics: science or ordinary beliefs? The question leads some to extremes. At one end, we find those who think that all metaphysics can do is report science. At the other end, we find those who think that metaphysics should ignore science and listen only to ordinary beliefs. Each extreme is questionable.

The first extreme ignores the fact that science does not settle all metaphysical questions, and also the fact that scientists are influenced by their metaphysical presuppositions. We need a metaphysics that goes beyond reporting science in order to address the unsettled questions and evaluate the presuppositions.

The second extreme subdivides. It includes those who think that science and ordinary beliefs can never conflict, because they address "different worlds" (the "world of ordinary life" and the "world of science"). And it includes those dogmatists who think that ordinary beliefs can never seriously be doubted. The problem with each subdivision is that neither ordinary beliefs nor science is intended to be about a *novel* subject matter. Each is about *the world*. Ordinary folks, naturally, have beliefs about the world; but they hope to learn more about it through science. In addition to believing that objects move in space over time, that actions take time, and that objects take up space, ordinary believers also expect science to tell us the underlying nature of space and time. Nor do scientists step into another world when they don their lab coats. The point of science is to understand how the world, the one world, the world in which ordinary folks live, works.

A moderate view of the relation between science and ordinary beliefs seems in order: metaphysics must listen to, but is not exhausted by, science. This, however, leaves the exact nature of the relation wide open. Perhaps ordinary beliefs are *epistemic starting points* – claims with which we are entitled to *begin* our inquiries, but which may later be revised, perhaps because they conflict with science, perhaps because they conflict with one another. Perhaps not all ordinary beliefs should be

taken equally seriously. We might, for example, grant more weight to beliefs that are fundamental to the structure of our thought about the world (recall the discussion of particulars and properties above), and grant little (if any) weight to ordinary beliefs about matters more properly addressed by the sciences. Perhaps the mere fact that a belief is an *ordinary* one counts for nothing at all; perhaps we should instead trust *reason*, a faculty capable of guiding both philosophically sophisticated scientists and scientifically informed philosophers.

Any metaphysician is bound, sooner or later, to face the following challenge. Science has been wildly successful. It has led to increasingly successful theories, technological advances, and consensus as to the truth. The history of metaphysics, on the other hand, has been as much one of wild goose chases as progress. Metaphysicians (like all philosophers!) continue to disagree about the same issues for millennia, and have not sent anyone to the moon.

This leads some philosophers to doubt that metaphysics has any value at all. A certain empiricist tradition in epistemology says that the only route to truth is through the senses, and ultimately through science. If you can't do an experiment to settle a question, the question isn't worth asking. At best, it is an idle question whose answer we will never know; at worst, the question is meaningless.

The empiricist is moved by an admirable desire to rid philosophy of undisciplined speculation. But the only empiricism that flatly rules out all metaphysics is one based on a naive view of science. Real scientists do not just "summarize what they see." Scientists must regularly choose between many theories that are consistent with the observed data. Their choices are governed by criteria like simplicity, comprehensiveness, and elegance. This is especially true in very theoretical parts of science, for instance theoretical physics, not to mention mathematics and logic.

A realistic picture of science leaves room for a metaphysics tempered by humility. Just like scientists, metaphysicians begin with observations, albeit quite mundane ones: there are objects, these objects have properties, they last over time, and so on. And just like scientists, metaphysicians go on to construct general theories based on these observations, even though the observations do not logically settle which theory is correct. In doing so, metaphysicians use standards for choosing theories that are like the standards used by scientists (simplicity, comprehensiveness, elegance, and so on).

Emphasizing continuity with science helps to dispel radical pessimism about metaphysics; the humility comes in when we remember the discontinuities. Observation bears on metaphysics in a very indirect way, and it is far less clear how to employ standards of theory choice (like simplicity) in metaphysics than it is in science. But metaphysicians can, and should, acknowledge this. Metaphysics is speculative, and rarely if ever results in certainty. Who would have thought otherwise?

Exactly what one should say about empiricism and metaphysics is a deep philosophical question in its own right, and it's unlikely that anyone will decisively answer it anytime soon. But that shouldn't, on its own, deter you from thinking about metaphysics. Philosophy is the one discipline in which questions about the value of that discipline are central questions within that very discipline. The philosopher must therefore live with uncertainty about whether her life's work is ultimately meaningful – that is the cost of the breadth of reflection demanded by philosophy. Philosophy's

reflective nature is generally a good thing, but the down side is that it can lead to paralysis. Don't let it. You don't need to have answers to all meta-questions before you can ask first-order questions (just as you don't need to sort out the philosophy of biology before doing good work in biology). The meta-questions are certainly important. But the history of philosophy is full of sweeping theories saying that this or that bit of philosophy is impossible. Take heart in the knowledge that these have all failed miserably.

Notes

1 As opposed to, for example, what the world *ought* to be like (ethics), what we *know* about the world (epistemology), how we *think of* and *talk about* the world (philosophy of mind and language), and so on.
2 Some facts consist of multiple particulars having a "multi-place" property, also known as a relation. Philadelphia is 100 miles from New York: the particulars Philadelphia and New York have the *100 miles from* relation.

ABSTRACT ENTITIES

"Concrete" entities are the entities with which we are most familiar: tables, chairs, planets, protons, people, animals, and so on. "Abstract" entities are less familiar: numbers (for example, the number seven), properties (for example, the property of *being round*), and propositions (for example, the proposition *that snow is white*). Do abstract entities really exist? No one has ever seen, touched, or heard an abstract entity; but Chris Swoyer argues that they exist nevertheless. Cian Dorr argues that they do not.

Abstract Entities

Chris Swoyer

One of the most puzzling topics for newcomers to metaphysics is the debate about abstract entities, things like numbers (seven), sets (the set of even numbers), properties (triangularity), and so on. The major questions about abstract entities are whether there are any, if so which ones there are, and if any do exist, what they are like.

My aim here is to provide a brief and accessible overview of the debates about abstract entities. I will try to explain what abstract entities are and to say why they are important, not only in contemporary metaphysics but also in other areas of philosophy. Like many significant philosophical debates, those involving abstract entities are especially interesting, and difficult, because there are strong motivations for the views on each side.

In the first section, I discuss what abstract entities are and how they differ from concrete entities and in the second section, I consider the most compelling kinds of arguments for believing that abstract entities exist. In the third section, I consider two examples, focusing on numbers (which will be more familiar to newcomers than other types of abstract objects) and properties (to illustrate a less familiar sort of abstract entity). In the final section, I examine the costs and benefits of philosophical accounts that employ abstract entities.[1]

1 What are Abstract Entities?

Prominent examples of abstract entities (also known as *abstract objects*) include numbers, sets, properties and relations, propositions, facts and states-of-affairs, possible worlds, and merely-possible individuals (we'll see what some of these are in a bit). Such entities are typically contrasted with concrete entities – things like trees, dogs, tables, the Earth, and Hoboken. I won't discuss all of these examples, but will consider a few of the more accessible ones as case studies to help orient the reader.

Numbers and sets

Thought and talk about numbers are extremely familiar. We learn about the natural numbers (like three, four, and four billion), about fractions (rational numbers, like $^2/_3$ and $^7/_8$), and about irrational numbers (like the square root of 2 and e). And we learned a bit about sets in school – for example, the empty set, the set containing just 3 and 4, and the set of even numbers; we even learned to write names of sets using notation like '{3,4}'.

But what *are* numbers and sets? We cannot see them or point to them; they do not seem to have any location, nor do they interact with us or any of our instruments for detection or measurement in any discernible way. This may lead us to wonder whether there really are any such things as numbers, and whether, when we say things like "there is exactly one prime number between four and six," we are literally and truly asserting that such a number exists (after all, what could it be?). But, as we will see in section 3.1, there are also strong philosophical arguments that numbers do exist. Hence a philosophical problem: do they or don't they?

Properties and relations

The world is full of resemblances, recurrences, repetitions, similarities. Tom and Ann are the same height. Tom is the same height now as John was a year ago. All electrons have a charge of 1.6022×10^{-19} coulomb. The examples are endless. There are also recurrences in relations and patterns and structures. Bob and Carol are married, and so are Ted and Alice; the identity relation is symmetrical, and so is that of similarity. Resemblance and similarity are also central features of our experience and thought; indeed not just classifications, but all the higher cognitive processes involve general concepts. Philosophers call these attributes of qualities or features of things (like their color and shape and electrical charge) *properties*. Properties are the ways things can be; similarly, relations are the ways things can be related.

Assuming for the moment that there are properties and relations, it appears that many things have them. Physical objects: The table weighs six pounds, is brown, is a poor conductor of electricity, and is heavier than the chair. Events: World War I was bloody and was fought mainly in Europe. People: Wilbur is six feet tall, an accountant, irascible, and married to Jane. Numbers: three is odd, prime, and greater than two. All of these ways things can be and ways they can be related are repeatable; two tables can have the same weight, two wars can both be bloody. The two adjacent diamonds in figure 1 are the same size, orientation, and uniform shade of gray.

Champions of properties hold that things like grayness (or being gray) and triangularity (or being triangular) are properties, and that things like being adjacent and being a quarter of an inch apart are relations. Since the goal here is just to give one prominent example of a (putative) sort of abstract object, I will think of properties as universals (as many, but not all, philosophers do). On this construal, there is a single, universal entity, the property of being gray, that is possessed or exemplified by each

a b

Figure 1   Resemblances and Ways Things Can Be

of the two diamonds in our figure. It is wholly present in both *a* and *b*, and will remain so as long as each remains gray.

Philosophers who concur that properties exist may disagree about which properties there are and what they are like, but at least many properties (according to numerous philosophers, all) are abstract entities. Perhaps a property like redness is located in those things that are red, but where is justice, or the property of being a prime number, or the relation of life a century before? Such properties and relations exist outside space and time and the causal order, so they are rather mysterious. But, as we will see, there are also good reasons for thinking that properties and relations can do serious philosophical work, helping explain otherwise puzzling philosophical phenomena. This is a reason to think that they do exist. Another problem.

Propositions

Two people can use different words to say the same thing; indeed, they can even use different languages. When Tom says "Snow is white" and Hans says "Schnee ist weiss," there is an obvious sense in which they say the same thing. So whatever this thing is, it seems to be independent of any particular language. Philosophers call these entities *propositions*. They are abstract objects that exist independently of language and even thought (though of course many of them are expressed in language). Propositions have been said to be the basic things that are true or false, the basic truth-bearers, with the sentences or statements that express them being derivatively true or false.

In addition to saying that snow is white, Tom also believes that snow is white; and Hans, who speaks no English, also believes that snow is white (although he expresses the belief by saying "Schnee ist weiss"). Again, there is an obvious sense in which they believe the same thing. Some philosophers urge that the best way to explain this is to conclude that *there is* some one thing that Tom and Hans both believe. On this view, propositions are said to be the contents or meanings of beliefs, desires, hopes, and the like. They are also said to be the objects of beliefs. Thus the object of Tom's belief that red is a bright color is the proposition that red is a bright color.

On this view propositions are abstract objects that express the meanings of sentences, serve as the bearers of truth values (truth and falsehood), and are the objects of belief. But like numbers, propositions are somewhat mysterious. We can't see them, hear them, point to them. They don't seem to do anything at all. This gives us reason to doubt their existence. But, there are also reasons to think that they exist. Problems, problems, problems.

1.1 What abstract entities are (nearly enough)

Debates about abstract objects play a central role in contemporary metaphysics. There is wide agreement about the paradigm examples of abstract entities, though there is also disagreement about the exact way to characterize what counts as abstractness. Perhaps this shouldn't come as a surprise; if any two things are so dissimilar that their difference is brute and primitive and hard to pin down, abstract entities and concrete entities (*abstracta* and *concreta*) are certainly plausible candidates.

Even so, the philosophically important features of the paradigm examples of abstracta (like those listed above) are pretty clear. They are atemporal, non-spatial,

and acausal – i.e., they do not exist in time or space (or space-time), they cannot make anything happen, nothing can affect them, and they are incapable of change. Neither they, their properties, nor events involving them can make anything happen here in the natural world. We don't see them, feel them, taste them, or see their traces in the world around us. Still, according to a familiar metaphor of some philosophers, they exist "out there," independent of human language and thought.

Being atemporal, non-spatial, and acausal are not all necessary for being abstract in the sense many philosophers have in mind. Thus, many things that seem to be abstract also seem to have a beginning (and ending) in time, among them natural languages like Urdu and dance styles like the Charleston. It may seem tempting to say that such things exist in time but not in space, but where exactly? Moreover, this claim can't be literally true in a relativistic world (like ours certainly seems to be), where space and time are (framework-dependent) aspects of a single, more basic thing, namely space-time.

And not all are sufficient. For example, an elementary particle (e.g., an electron) that is not in an eigenstate for a definite spatial location is typically thought to lack any definite position in space. The technicalities don't matter here; the point is just that although such particles may seem odd, they do have causal powers, and so virtually no one would classify them as abstract. Again, according to many religious traditions, God exists outside of space and time, but he brought everything else into existence, and so many would be reluctant to classify him as an abstract object.

All this suggests that the division into concrete and abstract may be too restrictive, or that abstractness may come in degrees. I won't consider such possibilities here, however, because the puzzles about abstract entities that most worry philosophers concern those entities that are, if they exist, atemporal, non-spatial, *and* acausal. And we don't need a sharp bright line between abstracta and concreta to examine these.

A philosopher who believes in the existence of a given sort of abstract entity is called a *realist* about that sort of entity, and a philosopher who disbelieves is called an *anti-realist* about it. Abstract entities are not a package deal; it is quite consistent, and not uncommon, for a philosopher to be a realist about some kinds of abstract entities (e.g., properties) and an anti-realist about others (e.g., numbers).

Not-quite existence

Finally, some champions of abstract entities claim that there are such things, but grant them a lower grade of being than the normal, straightforward sort of existence enjoyed by George Bush and the Eiffel Tower. They often devise esoteric labels for this state; for example, numbers, properties, and the like have been said to *have being*, to *subsist*, to *exist but not be actual*, or partake of one or another of the bewildering varieties of not-quite-full existence contrived by philosophers. Such claims are rarely very clear, but frequently they at least mean that a given sort of entity is real in some sense, but doesn't exist in the spatiotemporal causal order. Which is pretty much just to say it is abstract.

We will not pursue such matters here, however, since many of the same problems arise whether the issue about the status of abstracta is framed in terms of the existence or merely the subsistence or being of such things. Whatever mode of being the number two possesses, we still cannot perceive it, or pick it out in any way, and it seems to

make no difference to anything here in the natural world. Because many of the most debated issues arise for all the proposed modes of being of abstract objects, I will focus on existence.

Why questions about abstracta matter

Explicit discussion of abstract entities is a relatively recent philosophical phenomenon. Plato's Forms (his version of universal properties) have many of the features of abstract objects. They exist outside of space and time, but they seem to have some causal efficacy. We can learn about them, perhaps even do something like perceive them, though perhaps only in an earlier life (this is Plato's doctrine of recollection).

Soon after Plato, properties and other candidate abstracta – e.g., merely possible individuals (individual things, e.g., persons, that could have existed but don't) – were reconstrued as ideas in the mind of God. This occurred through the influence of Augustine and others, partly under the influence of Plotinus and partly under that of Christianity. Human beings were thought to have access to these ideas because of divine illumination, wherein God somehow transferred his ideas into our minds. In later accounts like Descartes' we had access to such ideas because God placed them in our minds at birth (they are innate). Such views persisted though medieval philosophy and well into the modern period. In this period, philosophers like Locke began to view what we thought of above as properties (e.g., redness, justice) as ideas or concepts in individual human minds.

It was really only in the nineteenth century, with work on logic and linguistic meaning by figures like Bernard Bolzano and Gottlob Frege, that abstract entities began to come into their own. They emerged with a vengeance around the turn of the twentieth century, with work in logic, the theory of meaning, and the philosophy of mathematics, and, more generally, because of a strongly realist reorientation of much of philosophy at this time in the English- and German-speaking worlds. After a few decades, interest in abstract entities subsided, but by the end of the twentieth century, there was perhaps more discussion of a wider array of abstract objects than ever before.

Although explicit discussion of abstract entities has a fairly recent history, they are central to debates over venerable philosophical issues, including the nature of mathematical truth, the meanings of words and sentences, the features of causation, and the nature of cognitive states like belief and desire. These debates also lie at the center of many perennial disputes over realism and anti-realism, particularly standard flavors of nominalism. Discussions about the existence of abstract objects may also illuminate the nature of human beings and our place in the world. If there are no abstract objects, nothing that transcends the spatiotemporal causal order, then there may well be no transcendent values or standards (e.g., no eternal moral properties) to ground our practices and evaluations. And if there is also no God, it looks like truth and value must instead be somehow rooted here in the natural order. We are more on our own.

2 Why Believe there are Abstract Objects?

The central questions about abstract objects are: Are there any? If at least some kinds of abstract objects exist, can we discover what they are like? How can we decide such issues? (This question is a problem because it seems to be difficult to make contact

with abstract objects in order to learn about their nature.) In this section I will offer an answer to the first question that also suggests an answer to the second.

A good way to get a handle on the issues involving abstract entities is to begin by focusing on the *point* of introducing them in the first place. Philosophers who champion one or another type of abstract object almost always do so because they think those objects are needed to solve certain philosophical problems, and their views about the nature of these abstracta are strongly influenced by the problems they think they are needed to solve and the ways in which they (are hoped to) solve them. Hence, our discussion here will be organized around the tasks abstracta have been introduced to perform. These tasks are typically *explanatory*, to explain various features of philosophically interesting phenomena, so to understand such accounts we need to ask about the legitimacy, role, and nature of explanation in metaphysics.

2.1 Philosophical explanations and existence

Ontology is the branch of metaphysics that deals with the most general issues about existence. Of course we know a great deal about what sorts of things exist just from daily life: things like trees, cats, cars, other people, the moon. And science tells us more about what sorts of things there are: electrons, molecules of table salt, genes. But ontology attempts to get at the most general categories or sorts of things there are, e.g., physical objects, persons, numbers, properties, and the like. Some philosophers doubt that the very enterprise of ontology makes sense (see chapter 9), but we will begin by assuming that it does.

For many centuries ontology aspired to be a demonstrative enterprise. On this traditional conception, ontology employs valid arguments to establish conclusions about what the most general and fundamental things in the universe are. It proceeds from obviously secure premises, step by deductively valid step, to obviously secure conclusions. The traditional standards for security were very high, requiring unassailable, necessary, self-evident "first principles." These were supposed to be claims that couldn't possibly be false and that no reasonable person could doubt.

The chief problem with this picture is that when we judge classical arguments in ontology by such standards, most fail, and many fail miserably. There is, among other things, no consensus about which candidates for first principles are even true, much less necessarily so, and, in many cases, demanding valid arguments seems to be asking for too much. By these standards, even the best that the greatest philosophers could devise comes up far short.

Nowadays, many philosophers would gladly settle for premises that are uncontroversially true – or even just fairly plausible. But they still devote a good deal of time distilling arguments for (or against) the existence of one or another sort of abstract object down to a few numbered premises and a conclusion to write on the board; they check for validity, and then (most often) dismiss the arguments. This approach is often invaluable, but it has limitations. For one thing, few philosophical arguments survive long when judged by the pass–fail standards of deductive validity (how likely is it, after all these centuries of inconclusive results, that Jones has just devised an unassailable demonstration that properties exist?). Indeed, it is quite possible that there are no deductively sound arguments beginning from true premises which do

not mention abstracta and end with conclusions that abstracta exist ("no abstracta in, no abstracta out"). We often miss things of value if we write arguments off simply because they are not deductively valid. But if traditional and contemporary versions of the demonstrative ideal set the bar too high, how should we think about arguments and disagreements in ontology?

When we turn to the ways philosophers *actually* evaluate views about abstract objects, we typically find things turning on the pluses and minuses of one view compared to those of its competitors. And a very common feature of the (putative) pluses is that they involve explanation. For example, we are told that the existence of numbers would explain mathematical truth or that the existence or properties (like triangularity) would explain why it is that various objects are triangular and that it would also help explain how we recognize newly encountered triangles as triangles.

Moreover, even when the word 'explain' is absent, we frequently hear that some phenomenon holds in virtue of, or because of, this or that property, that a property is the ground or foundation or most enlightening account of some phenomenon, or that a property is (in part) the truthmaker, the *fundamentum in re* (as the medievals would have said) for the phenomenon. For example, it has been urged that the exemplification of a single, common property grounds the fact that our two items in figure 1 (above) are triangular; it makes it true that each is a triangle. The same property also helps to explain how we recognize that they are triangular and why the world 'triangle' applies to them.

Similar claims have been made on behalf of other abstracta. The role of expressions like 'explain' is to give reasons, to answer why-questions, which is a central point of explanation. My suggestion is that we should (re)construe arguments for the existence of abstract entities as inferences to the best overall available ontological explanation (we'll return to this in sections 3 and 4; see also Swoyer 1982, 1983, 1999a).

I will develop this idea in the course of examining the example of numbers, but first let's see what morals we can draw from the view that arguments for the existence of abstract objects are *ampliative* (i.e., deductively invalid but capable of offering good, though not conclusive, support for their conclusions).

First, we should acknowledge at the outset that there will rarely (probably never) be knock-down arguments for (or against) the existence of any type of abstract entity. On this approach, metaphysics (including ontology) is a fallibilistic, ever-revisable enterprise. By way of example, twentieth-century physics presents us with a very surprising picture of physical reality, and it may well call for innovations in ontology. To note just one case, quantum field theory, that branch of physics that deals with things at a very small scale (quarks, electrons, etc.), strongly suggests that there are (at the fundamental level) no individual, particular things; there may be no fact about how many "particles" of a given kind there are in a particular region of space-time. If so, the traditional view that individuals or substances are a fundamental category of reality may be overthrown.

Second, although each specific argument for the existence of a certain kind of abstract entity may not be fully compelling, if there are a number of independent arguments that a given sort of entity exists, the claim that they do could receive *cumulative confirmation* by helping to explain a variety of phenomena.

Third, if some type of abstract entity is postulated to play particular explanatory roles, this *affords a principled way to learn about its nature.* We ask what such an entity would have to be like in order to play the roles it is postulated to fill. What, to take a question considered below, would the existence or identity conditions of properties have to be for them to serve as the meanings of predicates like 'round' or 'red'?

If we are fortunate, we might devise a series of ontological explanations that employ the same entity. This increases information, because different explanations may tell us different things about what that entity is like. It also increases confirmation, because the sequence of explanation may provide cumulative support for the claim that the entity they all invoke actually exists.

Explanatory targets and target ranges

An explanation requires at least two things. First, something to be explained, an *explanation target.* Second, something to explain it. In ontology, it is a philosophical theory (though "theory" is often a bit grandiose) like Plato's theory of forms that does the explaining. We will be concerned with those theories that employ abstract objects in their explanation.

Explanation targets for ontology can come from anywhere. From the everyday world around us (e.g., different objects can be the same color, and a single object can change color over time); from mathematics (e.g., it is necessarily the case that three is a prime number); from natural languages (e.g., the word 'triangle' is true of many different individual figures); from science (e.g., objects attract one another because of their gravitational mass but may repel one another if they are different charges). Explanation targets for ontology can come from almost any area of philosophy (e.g., many moral values seem to be objective, but it's a bit mysterious how this can be so). I will call a more-or-less unified collection of explanation targets a *target domain.*

In the next section I briefly discuss several target domains that have led some philosophers to postulate abstract entities. Although I believe that arguments in ontology are usually best construed as ampliative, much of what follows can be adapted fairly straightforwardly to the view that philosophical arguments should aim to be deductively sound.

3 Examples of Work Abstracta Might Do

When we turn to actual debates about abstract objects, we find few (arguably no) knock-down, iron-clad, settled-once-and-for-all arguments for, or against, the existence of most of the abstract objects that interest philosophers. Instead, the evaluation of the arguments involves the art of making trade-offs, the weighing of philosophical costs and philosophical benefits. I will urge that although there are widely shared, quite sensible criteria for this, they fall short of providing rules or a recipe that forces a uniquely correct answer to the question of which, if any, abstract entities exist. Benefits rarely come without costs, and we will examine some of the costs of abstracta in section 4. In this section we will consider some of their benefits.

There are many candidate abstracta and there is space to discuss only one. I will focus on the natural numbers (0, 1, 2, and so on up forever), because this example will be familiar to readers with little background in philosophy.