Orals Notes

Bradley Rettler August 12, 2011

*This is the culmination of a semester's worth of work on the material for my oral examinations. I have tried, as much as possible, to keep it purely expository. Of course, as is the nature of condensing over 1000 pages into 100 pages, given my particular background and needs, I have inevitably left out much important material — **this outline is no substitute for reading the papers discussed**. By reading past this paragraph, you agree not to use any material in a way that falls outside the guidelines of the honor code of your institution.*

Contents

1 Meta-Ontology

1.1 Carnap — Empiricism, semantics, and ontology

1.1.1 The Problem of Abstract Entities.

Empiricists are generally nominalists. Thus, they don't want to quantify over abstracta. But how to talk about math and semantics and meanings and the like? **Carnap's Thesis: Using such a language does not entail embracing the ontology**.

1.1.2 Linguistic frameworks.

In order to speak about a new kind of entity, you have to introduce a new way of speaking, with new rules. This procedure is "constructing a linguistic framework". Then there are internal existence questions, regarding the entities within the framework, and external existence questions, regarding the system as a whole. Internal existence questions are answerable with the new expressions and logical/empirical methods. External questions are harder, but will turn out to be either (i) answerable because of pragmatic considerations or (ii) meaningless.

The World. We have a spatially ordered system of things. We learn how to talk about it, and we answer questions about it (using empirical methods). What about the world itself; is it real? Only philosophers talk about that, and they don't get anywhere because it's an ill-formed question. To be real is to be in the system, so you can't ask if the system is real. What they're really asking is, "Should we use this formulation?" And (if we have a choice at all) it's a matter of taste.

The System of Members. We introduce new expressions and rules: numerals like 'five' and sentences like 'there are five books on the table', general term 'number' for new entities, expressions for properties and relations and functions of numbers like 'prime', and quantifiers. The answers to the internal questions are then analytic and trivial.

The System of Propositions. We introduce variables and propositions and the term 'proposition'. So for any declarative sentence S, 'S is a proposition' is analytic. We can admit predicates who take sentences as arguments and introduce rules for them. This tells us that propositions aren't mental events, since the rules would be different. And they are not linguistic, since the rules would include reference to language.

The System of Thing Properties. We introduce words to describe what things are like, and variables for which the words are substitutable.

The System of Numbers. We introduce integers as relations between natural numbers and the rational numbers as relations among integers. The reals are a special kind of rationals.

Some questions are internal and analytic, and some are internal and empirical. Some are external and meaningless, and some are external and practical.

1.1.3 What does acceptance of a kind of entities mean?

First we introduce predicate for the new kind of entities, then variables, then general sentences about the new entities. Some philosophers want to ask questions about the existence of the whole system. This is ridiculous, because introducing the new ways of talking (ie, accepting a linguistic framework) isn't existence-entailing. The question of the reality of the system is a psuedo-question, devoid of cognitive content.

1.1.4 Abstract entities in semantics?

Many empiricists want to use the word 'five' and 'property', but they think those words don't designate anything. In the system, 'five is a number' is analytic. Supplemented with some rules about designation, "five' designates a number' comes out analytic.

Empiricists and nominalists think we can't trade in talk of abstracta, since they think we need to make sure our talk corresponds to something before we can use it.

This is the external question. But we have seen that the external question is practical, and not in need of theoretical justification.

Let us grant to those who work in any special field of investigation the freedom to use any form of expression which seems useful to them; the work in the field will sooner or later lead to the elimination of those forms which have no useful function.

1.2 Quine — On What There Is

How do we characterize ontological disputes? If McX believes there are tables and Wyman does not, Wyman cannot say, "there are things that McX believes that I do not". So, the negative side has a hard time formulating the dispute.

McX: Consider Pegasus. If we deny that he exists, then there is something of which we deny the existence. So, that thing exists. But there's no winged horse, so Pegasus must be an idea in the mind. But nobody denies *that*!

Wyman: Consider Pegasus. If we deny that he exists, then there is something of which we deny the existence. So, that thing exists. But there's no winged horse, so Pegasus must be non-actual. He is a merely possible winged horse. But merely possible things don't exist. So Pegasus doesn't exist. But he *is*.

Quine: In Reply to Wyman, we ought to insist that all possibility is *de dicto*. There are no merely possible *things*. And de dicto possibility isn't possible existence, but possible truth. And there are impossible things we can talk about, like the biggest round square.

But Wyman replies that the phrase "there is no biggest round square" is meaningless. That is, all contradictions are meaningless. This ruins proofs by *reductio*, and also makes it impossible to decide whether something makes sense (since Church showed there's no test for contradictoriness).

Russell's analysis helps: Names (which are short for definite descriptions) are fragments of the whole sentences in which they occur. We remove names and replace them with bound variables. 'The author of *Waverly*' becomes '(x)(x wrote *Waverly*)'. And sentences containing it are either (i) true, or (ii) false, but meaningful. Any statement ascribing or denying being doesn't use a name, but a description, and so cannot be alleged to presuppose the existence of the thing named/described. So, with Pegasus we just rephrase it as a description. And we can always do that, because we can always pick out the property *being a*, where 'a' is the name of the thing whose existence is in question.

We ontologically commit ourselves to Fs when we say there are Fs. But we do not commit ourselves to Fs when we deny that there are Fs. And we do not commit ourselves to x when we deny that x exists.

There is a huge gulf between meaning and naming. Two names, even if they refer to the same thing, don't have the same meaning. (Otherwise we could reflect on meaning to see that the Evening Star is the Morning Star.) So, the meaning can't be the object. But then in order for 'Pegasus' to be meaningful, he needn't exist. Also the object isn't an idea in the mind.

1.2.1 Universals.

McX says, "There are red houses and red barns. They have something in common. That's what I mean by redness." But one might detract. And McX can't say that 'red' must name something, since we dispensed with that idea above. But McX might respond that in this case, the *meaning* of 'red' is a universal, and so there are universals. So Quine refuses to admit meanings, though he allows that words/sentences are meaningful. It's just a brute fact.

Talk of meaning(s) boils down to the having of meanings and the sameness of meaning. Giving the meaning is just uttering a synonym. So we can speak of words being significant (having meaning) or insignificant (not having meaning), heteronymous (having the same meaning) or non-heteronymous (not having the same meaning). This is a paraphrase to avoid ontological commitment to meanings. We can't precisely define the terms, but we don't need meanings to do it.

1.2.2 Ontological Commitment.

McX starts to wonder if we can ever say anything to commit us to universals. Quine says yes, but only by bound variables. For example: There are red houses and red trees, and there is something they have in common. Names won't do it: they can be converted to descriptions, and Russell has shown that descriptions can be eliminated. To be is to be the value of a variable.

Mathematics is up to its ears in discussions of ontological commitment. **A theory is committed to those and only those entities to which the bound variables of the theory must be capable of referring in order that the affirmations made in the theory be true**.

Ontology of Math. Logicism (bound variable can refer to abstracta) = Realism (universals have mind-independent being), Intuitionism (bound variables can refer to abstracta only if the abstracta are 'invented') = Conceptualism (universals are man-made), Formalism (math is useful but nonreferential) = Nominalism (no abstracta).

Judging Ontologies. Operate on a semantical plain; we can talk about other people's sentences, as long as our variables don't bind crazy things. WHAT THERE IS DOES NOT DEPEND ON WORDS. How to choose? "We adopt, at least insofar as we are reasonable, the **simplest** conceptual scheme into which the disordered fragments of raw experience can be fitted and arranged." To whatever extent choice of a scientific theory depends on the language, choice of an ontology depends on language to the exact same extent.

We have to develop our theories. We should do our best to see how little ontology we can get away with while still keeping the niceties (math, physics, etc).

1.3 Schaffer — On What Grounds What

Goal: reviving an Aristotelian view of metaphysics that it's not about what there is, but about what grounds what. Also advocates dismissivism about the question of what there is.

1.3.1 Three Conceptions of Structure

Quineanism. Dominant. The question is 'what is there?' The task of metaphysics is to say what exists, and the method is to extract existence commitments from the best theory (a la Peter's #5 below). Deserves praise: integrated concept, promising progress, revival from positivism. But it's revisionary.

Aristotelianism. About what grounds what. About substance — the basic, fundamental unit of being. The task is to say what grounds what, and the method is to deploy diagnostics for what is fundamental and for grounding. He cares about how something exists. The Quinean will care and the Aristotelian will not about existence questions; the Aristotelian will care and the Quinean will not about fundamentality questions.

Existence questions matter; what exists are the grounds, grounded, and grounding relation(s). Everything is either grounded in a substance or is a substance. We can bloat our ontology as long as the grounding base is sparse.

1.3.2 Flat, Sorted, Ordered

Quineans have a flat ontology, Aristotelians have an ordered ontology. A third view is the sorted ontology, where one figures out the number of categories and the sets of entities in each category.

Flat structure: The target of metaphysical inquiry is an unstructed list of existents E. Sorted structure: The target of metaphysical inquiry is (i) the number of categories n, and (ii) lists E_1 — E_n of entities in each category. Ordered structure: The target of metaphysical inquiry is an ordered hierarchy generated from (i) a list of the substances F, plus (ii) a list of the grounding relations G.

Which is the best structure? The flat ontology doesn't subsume the ordered or ordered; given a list of things, there's no guarantee of a sorting. A sorted ontology subsumes a flat ontology but not an ordered (since doesn't tell you what, if anything, is basic). An ordered ontology subsumes a flat and probably a sorted if the sorting is determined by the grounding relations (and it should be!). The categories are ways things depend on substances.

1.3.3 3 Arguments for Ordered+Permissivism

Triviality of Existence Questions. (a) There are prime numbers; therefore (b) there are numbers. (a) is obviously true, to everybody. Reply 1: only according to the fiction. Rejoinder: The argument doesn't say anything about fictions. So is (a) false? Of course not. Reply 2: The sense of 'are' shifts from framework-internal to framework-external. Rejoinder: No linguistic evidence for that, and in fact the adjective-drop wouldn't be valid. Reply 3: Quantification is ontologically neutral. Rejoinder: the only way to do this is Meinongianism, and it is crazy.

The same argument can be run for properties, parts, fictional characters, and God.

Objection 1: There are proposals that allow us to eliminate spooky things like numbers. Reply: Distinguish the proposal from the accompanying Quinean gloss. If Field's proposal works, it shows that numbers are grounded in concrete substances.

Objection 2: Countervailing intuitions of unreality (about fictional characters). Reply: Usually we are using a restricted domain.

Objection 3: Permissivism violates methodological or epistemological dicta like Occam's Razor. Reply: Occam's Razor only concerns substances — things at the fundamental level.

The Importance of Dependence Structure. Many times opponents agree on the existence-questions. For example, realists and idealists agree that there are rocks, realists and constructivists agree that there are numbers, universalists and (some) nominalists agree that there are properties, substratum and bundle theorists agree that there are objects and properties, dualists and materialists agree that there is

mind and matter, and substantitivalists and relationalists agree that there is space. The disputes are all over grounding/dependence.

Reply 1: Other central metaphysical questions are existence questions. Rejoinder: Fine. The Aristotelian view can accommodate that. The Quinean view cannot accommodate grounding questions.

Reply 2: Grounding questions can be analyzed into existence questions via supervenience claims. Rejoinder: Supervenience is invoked to fake ordering in a flat ontology. Plus, supervenience analyses of grounding all fail: first, because it has the wrong formal features, being reflexive and non-asymmetric while grounding is irreflexive and asymmetric, and second, it is intensional while grounding is hyperintensional. There are substantive grounding questions about necessary existents, but not substantive supervenience questions. Grounding should be taken as primitive.

Reply 3: Grounding questions can be rephrased as existence questions, by packing grounding information into the description of a candidate entity (eg immanent number and transcendent number). Rejoinder: First, these are not the Quinean existence questions. Second, this makes metaphysics about certain kinds of existence questions. Third, every question can be about existence. Rather than how things persist, we can ask if there are things that are wholly present at two times. And so on.

Quineanism presupposes Aristotelianism. Five stages: best theory, canonical logic, translate theory into logic, find domain that's required, ontologically commit to domain. Requires ordering at every stage.

1) What makes a theory best? Presumably one reason we eliminate theories is that they deal with non-fundamental entities. And one reason we choose theories is because they posit as fundamental what we take to be fundamental. *The best theory is a theory of the fundamental.*

2) What makes a logic canonical? What your logic allows you to quantify over (impossible worlds, numbers) is important, and your views on grounding will influence what you want to be able to quantify over. *The canonical logic turns (in part) on what is fundamental.*

3) Which are the apt translations? Functorese vs fictionalist vs inverted. Some reason for the direction of the translation must be given, since we are supposed to be able to assert each instead of the other. *The apt translations are into talk of the fundamental.*

4) Which domain is required? All equinumerous domains can render the same formulae true. What determines our reference is which candidate is the most natural, and naturalness is an ordering relation. *The right domain is the domain of the fundamental.*

5) Where are the tables and chairs? The Quinean program is eliminativist by design, since physics in first-order logic doesn't quantify over chairs. The thing to say is that chairs are derivative. The Quinean method can only provide us with the basic entities. The ontological commitments of the regimented translation of the best theory are the fundamental entities. *We should also be ontologically committed to the grounding relations and the grounded things.*

1.3.4 Towards a neo-Aristotelian Framework

The Grounding Family. x is *fundamental*$=_{\text{df.}}$ nothing grounds x.
x is *derivative*$=_{\text{df.}}$ something grounds x.
x is an *existent* iff x is fundamental or x is derivative.
x is an *integrated whole*$=_{\text{df.}}$ x grounds each of its proper parts.
x is a *mere aggregate*$=_{\text{df.}}$ each of x's proper parts ground x.
x and y are *interdependent*$=_{\text{df.}}$ there is an integrated whole of which x and y are both proper parts.

Grounding Itself. Grounding is a natural and intuitive notion, for which there exist clear examples, and clear formal constraints. Entity and its singleton, Swiss cheese and its wholes, truthmakers and truths. Formally, best modeled as a two-place predicate. Entities may have a plurality of grounds. It's irreflexive, asymmetric, and transitive — like proper parthood and causation.

Illustration: A Neo-Aristotelian Metaphysic We must determine the fundamental, and the grounding relations. Three constraints on the fundamental. 1) The fundamental things are minimally complete. (A set S of entities at w is complete for w iff S serves to characterize w, by providing a supervenience base for w. S is minimally complete for w iff (i) S is complete for w, and (ii) no proper subset of S is complete for w.) 2) The fundamental things have a form that fits all metaphysical possibilities (ie, these features exist at all metaphysically possible worlds.) 3) The fundamental things have a content informed by fundamental physics.

Two diagnostics for the grounding relations. 1) Permissiveness: They generate a LOT of entities. 2) Abstraction: They are relations of abstraction. This gets us ontological free lunches.

These converge on priority monism: there is one substance, the whole cosmos. Substances are thick particulars. The that is spacetime, and the what is the fields. Also, universal decomposition.

1.4 Sider — Writing the Book of the World Chapter 1: Structure

Thesis: Metaphysics is about structure. Not possibility, essentiality, concepts or what there is.

What is structure? Structure is about patterns, categories, carving reality, and fundamentality. Two electrons go together, where an electron and a cow don't. People who talk about the world in terms of grue and bleen are, in some sense, *making a mistake*, even if they predicate truly all the time.

1.4.1 Skepticism

Why do the two electrons go together? They share infinitely many properties, but so do the electron and the cow. And the two electrons differ on infinitely many properties. And what's wrong with grue and bleen? Reply: Make a distinction between genuine features (the joint-carving ones) and the rest. But 'the rest' can't be so because they're disjunctive; after all, one could have a language with grue and bleen as primitive, and green and blue defined disjunctively.

Chisholm and Kim tried to give modal definitions of intrinsic properties, but they didn't work. Nowadays we're more comfortable with indefinable notions like 'genuine property' and 'intrinsic property'. Armstrong used universals, Lewis used natural properties. The distinction is objective and non-linguistic.

1.4.2 Structure and Metametaphysics

Ted is a realist about structure. He wants to expand our conception of structure's importance, generalize the concept of structure, and use that concept as the foundation of metametaphysics. Whether a debate is substantive turns on the extent to which it can be phrased in joint-carving language. The question of whether there are composite objects is a question about how much quantificational structure there is.

Call a language "fundamental" if all its expressions carve at the joints. Realism about structure leads to realism about fundamental languages. There is a privileged way to "write the book of the world", a privileged set of concepts one must use in order to conform one's beliefs to the world. 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. When god writes the book of the world, will she use quantifiers? The sentential connectives of propositional logic? Modal or tense operators? The realist about generalized structure thinks that these questions have objective answers.

1.5 Sider — Writing the Book of the World Chapter 9, §1-4,11,12,14: Ontology

Ordinary ontology is not interesting, but philosophical ontology is perplexing — like the question of whether there are holes. In part it's perplexing because we don't know how to answer it. (Quine thinks we should answer it by evaluating global theories, and then seeing the best global theory entails a certain answer.) It's also perplexing because we're not sure what we're asking; what does it take for a sock to contain a hole, over and above being perforated?

1.5.1 1. Deflationism

Deflationists think there is something wrong with our ontological questions; ordinary ontological questions make sense, but their answers are almost always obvious.

Option 1: Semantically Defective. Ontologists do not use 'there are holes' in accordance with ordinary standards, and so fail to use the ordinary senses. They have supplied no replacement senses, and there's no distinguished candidate meaning(s), so they are semantically empty or semantically indeterminate.

Option 2: Ordinary-ism. The ontologists' terms have their ordinary senses, since they are the best candidates. So, ontological questions have obvious answers.

1.5.2 2. Realism

Ontological debates are substantive, and about the world; they can be posed in a/the fundamental language. Ontological realism (unlike deflationism) allows for Quinean methodology. But Quinean methodology supplanted with the understanding that simplicity only matters for languages whose expressions carve at the joints. Realists must identify the crucial forms/terms. Quine: There are Fs, $\exists x Fx$. The question is **not** 'are Fs fundamental?', but rather 'are there Fs?' where 'there are'

is understood in its most fundamental sense. 'Fundamental' attaches to ideology, not ontology.

1.5.3 3. Ontologese

If there are very few things, it seems natural language quantifiers aren't joint-carving. So we either need a semantics that makes our normal sentences false, or a tolerant one that lets them be true. A tolerant one might be right, in which case quantifiers aren't joint-carving. Solution: introduce a fundamental quantifier stipulated to carve at the joints. How? Remove metasemantic pressure toward tolerant interpretations. (Not by using 'literally' or 'strictly speaking' or other nonsense.)

1.5.4 4. Predicates not the Issue

Thesis: Deflationists cannot say, "Ontological debates are non-substantive because the predicates don't carve at the joints." PvI thinks there aren't tables, Lewis thinks there are; replace 'table' (which is not joint-carving) with one of it's fundamental precisifications 'τ', and PvI and Lewis will still disagree as to whether there are τs, and the deflationist will still insist that the debate is non-substantive. You can't rephrase to 'particles arranged tablewise', since PvI doesn't think there's *a thing* that is particles arranged tablewise. Also, PvI and Lewis disagree on how many things there are. Consider a world with two simples; PvI would reject and Lewis would accept $\exists x \exists y \exists z(\neg x = y \wedge \neg x = z \wedge \neg y = z)$. The deflationist has to say that either the quantifier, the connectives, or the identity sign lead to the nonsubstantivity, so it must be the quantifier.

Hirsch and Putnam: there are multiple candidate meanings for the quantifiers such that none are more or less joint-carving. How to distinguish QV from quantifier restriction? The QVist must reject that there is a privileged unrestricted quantifier from which the rest are generated, since one could then do substantive ontology with the unrestricted one. Option 1: deny objective restriction. Option 2: there are multiple unrestricted quantifiers.

1.5.5 11. Metaontology and Conceptions of Fundamentality

Ted's notion of fundamentality: a subpropositional and noncomparative primitive notion of structure.

Fine's fundamentality. A propositional comparative notion of grounding and a propositional noncomparative notion of reality. Objection: how to distinguish deflationary views from nihilistic views? The nihilist thinks the debate is substantive but that 'part' isn't joint-carving; Fine can't say that. How to distinguish ontological deflationists from ontological nihilists (nothing is fundamental)? Deflationists are attacks on language, but the Finean ideology is about objects.

Schaffer's fundamentality. Neo-Aristotelian view revolving around grounding. 'Assuming Fs exist, what (if anything) grounds them?' But why take it that Quinean questions (about whether there are in fact Fs) are so easily answered? It's not because of his neo-Aristotelianism; it's just Moorean moves. The neo-Aristotelian framework, plus Mooreanism, keeps ontological questions alive. But so does the fundamentality theorist; the ordinary language ontology is obvious, but not the fundamental ontology.

Ecklund's fundamentality. Maximalism: reality is full; all objects that can coherently be supposed to exist do exist. He thinks it's deflationary; Ted thinks it's just a first-order view. But it's too ideologically unparsimonious to accept, since there's no reduction.

1.5.6 12. Ontological Commitment

Not clear what 'ontological commitment' amounts to. We could stipulate that 'ontologically committed to Fs' just means 'committed to Fs', but that doesn't let one believe in holes without being ontologically committed to holes. Ontological realism helps. 'S is ontologically committed to Fs' means 'S believes there are Fs, in the fundamental sense of 'there are".

Nominalists live in fear of being caught ontologically committing to universals, but that's crazy! Perhaps we should use 'metaphysical commitment' such you're metaphysically committed to Fs iff the fundamental fact(s) underlying your assertion(s) involve Fs. Thus, the way to show that someone is metaphysically committed to universals is to show that there are (fundamentally) universals.

1.5.7 14. NonQuinean First Order Ontology

Quineanism is not the only form of ontological realism. Meinongianism: the ontological question is which things are actual; there are holes, but do they exist? Many think Meinongianism is conceptually confused (what there is vs what exists). But suppose Meinong thought that both quantifiers and 'exists' carve at the joints. Then there is no confusion. There is a sharp dividing line.

Other options: ontological pluralism, Shamik's objectless language, sortal-relative quantifiers.

1.6 van Inwagen — Meta-ontology

Quineanism about meta-ontology. Five theses:

1.6.1 Being is not an activity

Against the phenomenologists. They say there is a most general activity all things engage in: being. Peter: the most general activity is enduring. It has something to do with being, but no moreso than does riding.

1.6.2 Being is the same as existence

Against the Meinongians. They say that 'there is' and 'exists' express different properties. Peter: there aren't any things that don't exist.

1.6.3 Being is univocal

Against the ontological pluralists. They say that 'exists' means different things depending on what kind of thing we're talking about (numbers, cats, possibilia). Peter: to say that Fs exist is always to say there is more than 1, and numbers are univocal. Objection: "There are Wednesdays and cats" sounds weird. Reply: pragmatics.

1.6.4 The sense of being is adequately captured by ∃

Against the substitutional quantificationalists. A system of introducing quantifiers and variables into English, with the goal of showing that our first-order logical apparatuses are abbreviations of things we already understand, and that '∃' is short for 'exists':

1. Add to pronouns subscripts: it_x, it_y, etc
2. Universal quantifier phrases: It is true of everything that it_x, etc
3. Existential quantifier phrases: It is true of at least one thing that it_x

4. Get rid of the pronoun 'it', and just use the variable
5. Instead of 'it is true of everything that', write '$\forall x$'
6. Instead of 'it is true of at least one thing that', write '$\exists x$'
7. Explain the quantifiers and variables in terms of things we understand

1.6.5 Criterion of ontological commitment

An answer to the question: What is the best way to answer the question: what is there? NOT looking at "theories" and applying a technique (conversion into the quantifier-variable idiom) to reveal their ontological commitments. Reason: There's no such thing that sentences are in or not in. Rather, they're in it to varying degrees. Also, sometimes it takes creativity. Also, there's no such thing as the "hidden logical form" of a sentence. Sometimes it's a philosophical question which of two translations of an English sentence into the quantifier-variable idiom is the best. One reason is because the original sentence may not appear to carry ontological commitment to *F*s, but the sentence(s) in the quantifier-variable idiom do. So, theories do not have hidden ontological commitments.

Rather, we should request that others introduce quantifiers and variables into their own sentences. If at some point an existential generalization of an open sentence ϕ can be formally deduced, then one is ontologically committed to things that satisfy ϕ.

Objection: Why?! Why not just stop playing the game? Reply 1: '$\exists$' *just is* an abbreviation for 'there is'. So you *have to*!! Reply 2: This leaves English predicates the seem connected without any apparent logical connection. So we are forced to think certain inferences invalid that seem valid.

So, what one should do is re-symbolize both sentences into sentences which don't have 'holes' as a predicate with things satisfying it, but of which the first still entails the second (since it seems to in English).

One conclusion: All ontological disputes in which the disputants don't accept Quine's criterion of ontological commitment are suspect, since we won't be able to saddle the disputants with the obvious ontological commitments of their sentences.

2 Persistence and Philosophy of Time

2.1 Heller — Temporal Parts of Four Dimensional Objects

The best objection to temporal parts is that nobody has made sense of what a temporal part is supposed to be. Thomson's account is that a temporal part comes into existence and goes out of existence during the object's existence and takes up some portion of the space that the object takes up. Heller offers a new account. The problem with Thomson's is its implicit 3-dimensionalism, which leads to a contradiction in Tibbles-type cases, and in me and me-now cases. Heller offers a 4D account that blocks the move to Tibbles=Tibb and me=me-now.

2.1.1 The View

Objects are spatiotemporal hunks of matter. They fill up regions of spacetime. They have temporal extent. Temporal boundaries are like spatial boundaries. Temporal parts fill up subregions of regions occupied by wholes. There are non-instantaneous temporal parts. They are objects, and parts. One can accept temporal parts and deny DAUP. '*x* is located at R' means *x* has a temporal part at R. '*x* exists at *t*' means that *x* has a part at *t*. Rings and hunks of gold overlap — ie, share a temporal part.

Any proper part of a four dimensional object is smaller than the whole object along at least one dimension. A proper temporal part is smaller along just one dimension, the temporal dimension. A temporal part of O is a spatiotemporal part that is the same spatial size as O for as long as that part exists, though it may be a smaller temporal size.

2.1.2 Body and Body-minus revisited

Instead of comparing Body with Body-minus, let us compare that part of Body which does exactly fill R with that part of Body-minus which also exactly fills R. It might be claimed that here we have an example of two distinct objects in the same space at the same time. But this again would be a mistake, for these temporal parts are not two distinct objects but, rather, one object under two descriptions. Body and

Body-minus have a common temporal part, just as my living room and my dining room have a common spatial part.

2.2 Hinchliff — The Puzzle of Change

Thesis: Rejecting a certain view about time (eternalism) will allow us to preserve all our intuitions about change. Extant answers to the problem of change all force us to deny some strong intuition about change.

2.2.1 The Puzzle

An inconsistent tetrad:

1. Objects persist through change.
2. Shapes are monadic properties.
3. The candle has the shape — not just a part of the candle.
4. The shapes are incompatible.

2.2.2 The Standard Solutions

Perdurantism Denies (3). The candle has different temporal parts at different times. The temporal parts are the primary bearers of the incompatible shapes. Also, denies that things alter; temporal parts are generated and destroyed.

Relationalism Denies (2). Objects endure, but have-at-times properties; they don't just have them. Or, instantiation is 3-place. Either way, these aren't monadic.

Relative properties Denies (2). Objects endure, but have properties-at-times. This makes them relations.

2.2.3 Eternalism

If the candle just has being straight. So it just has all its properties — the ones at *t*. But there's nothing special about *t*, on eternalism. So it just has all the properties it has at all times. That's where we get the contradiction. Eternalism forces us to deny at least one of (1)-(4).

2.2.4 Presentism

On presentism, the only properties a thing has are the things it has at present. Like actualism, presentism treats other times as stories about what did or will happen. Only one ersatz time correctly represents the way things are. This is unappealing, since when we talk about candles existing in the past, we think we're actually talking about another time, not an abstract representation of a time. And we don't think the truthmaker is a story, but the candle.

What would help is reference to non-existent objects. And we can do it. Presentism is consistent with both theories of reference determination. On the description theory, reference is determined by a cluster of properties associated with the name. All that the presentist requires is that the properties be suitably tensed so as not to imply that past objects exist. On the causal theory, reference is determined by a causal chain linking name to referent. All that the presentist requires is that the chain be specified in suitably tensed terms so as not to imply that past objects exist. The presentist may thus reject the assumption that we cannot refer to what does not exist.

Solving the Problem of Change Adverbial approach with reference to past times. 'It was/will be the case that S' iff it was/will be the case that 'S' is true. Thus the presentist can keep (1)-(4) and not use abstract times.

Does the presentist deny (1)? Only if one thinks that persistence entails different times. But that begs the question against the presentist. The facts in the present moment are all the facts; so there are facts about other times (since we can refer to the non-existent).

Does the presentist deny (2)? Objection: saying the candle was straight at *t* expressing a relation between the candle and *t*, the relation having-been-straight-at. The presentist can say this is a genuine monadic property, though, because it is a property than the candle can have simpliciter.

What about SR? There are spacetime points from which no signal can reach our spacetime point; these points are spacelike separated from us. There is no genuine objective simultaneity, and thus no objective present, and thus presentism is false.

The assumptions are the transitivity of reality, and that the present events are those simultaneous with us. The presentist should reject both. The second can be denied by here-nowism (in which case the transitivity principle is true) or the surface of the past light cone (in which case the transitivity principle is false).

2.3 Sider — All The World's a Stage

Thesis: We are person-stages. There are worms, but we are not them. The stage view resolves various puzzles about identity over time better than its rivals

2.3.1 Parfit's Puzzle

Identity is what matters vs psychological continuity is what matters. Both seem right, but they are incompatible because of cases of division. If Ted divides into Ed and Fred, then both are psychologically continuous, but it cannot be that both are Ted. Parfit rejects that identity is what matters.

Lewis claims they're the same thing: the I-relation, which holds between two things iff they're both parts of one person. So Lewis: a person stage matters to my present stage iff it bears the I-relation to my present stage. But this concerns what matters to person stages, not to persons. If Lewis is right, since two people can overlap on past person stages, one should fear what happens to the other — something that will never happen to him! Lewis responds that the shared stage can only have shared thoughts. Ted responds that thinking is different than mattering; if I'm comatose, I can't think about my future stages, but they still matter to me.

The Stage View and Parfit's Puzzle First, how does the stage view handle 'Ted was once a boy'? We should analyze it as: there is some past person stage x such that x is a boy and x bears the I-relation to Ted. (Just like the counterpart theorist does with modality and the counterpart relation.)

Objection: Then this isn't about *me*, it's about someone else. Reply: NO! I, me, [insert name here], have the property of having been a child.

The stage view lets us embrace the psychological and identity theories. For any persons P and P*, M(P*,P) iff P will be identical to P* (where 'M' means 'matters to'). I will be identical to my future stages. Since Ed and Fred are psychologically continuous with Ted, they matter; and since Ted will be each of them, they matter. But they won't be each other.

2.3.2 Counting Worms

Objection to Lewis: If persons are worms and persons can fission, then two persons can be in the same place at the same time.

Lewis' Reply: The persons overlap. Ted's rejoinder: That's *prima facie* pretty implausible. Ted accepts spacetime worms, and that they can overlap; and since persons can't overlap, persons mustn't be worms. Lewis takes a different moral: count differently. Where two roads coincide and I must cross, it's appropriate to tell me I must only cross one road. For persons, we count by the identity-at-t relation. Ted's Reply: counting is by identity; in Lewis' example, we are counting road segments by identity.

The Stage View and Counting Before I fission, I sit alone in my room; there is one stage, and thus one person. Lewis should have believed this, since he believes its modal analogue. Ted finds this compelling: if I were about to divide tomorrow, there would now be one person (counting by identity) in the room.

2.3.3 Spatially Coincident Objects

We want to count by identity the statue and the lump as one thing. But when the statue's squashed and goes out of existence tomorrow, the lump will still exist. Ted's view: the statue and lump are identical today, but won't be tomorrow; but Leibniz's law still holds. This is because there are sortal-relative I-relations for things like coins. So the statue is not statue I-related to anything tomorrow, and the lump is lump I-related to something that will exist tomorrow. There are many I-relations (like there are many counterpart relations), and which one we're talking about is contextually determined. Only the stage theorist can deny coincident entities. The other views must deny one, probably by saying that the coin will cease to be coin-like tomorrow. But then what is it, if not a coin? Could it cease to be copper and still be a coin? Is it just a lump of quarks?

Or, of course, one can deny artifacts.

Multiple Unity Relations Helps in a few ways. First, I'm instantaneous, but I'll exist tomorrow; how? I am denying that a stage is stage I-related to any future stage (stage I-relation is numerical identity, since stages are instantaneous); but it is person I-related to a stage tomorrow. Second, it helps with Tibbles and Tibb. Third, persons turning into other persons and vague identity cases.

2.3.4 Objections to the Stage View

Identity statements Many turn out to be false, like 'I am the irritating young boy of my childhood.' I can, however, say 'I was that irritating young boy'. The latter is what we mean, anyway. Another objection: nothing persists. But to think this just assumes a view of persistence inconsistent with the stage view. I did exist, since I'm I-related to earlier stages.

Temporal Humphrey Literally speaking, I will not wake up tomorrow. Ted's Reply: Yes, you will; you have the temporal property of waking up tomorrow, it just means you're I-related to a bunch of waking stages. So the objection must be with the analysis of the facts. The fact that I was a boy and will be a geezer is a fact about two things. But so also with worm theory, so this is just an objection to 4Dism. It's not common sense that the facts about temporal properties aren't really about stages; what is part of common sense is that objects have some temporal properties. Intuitions about theoretical analysis are negotiable.

Objection: Take the timeless view and ask, 'how many people are there?' The answer must be an infinite number, and that's wrong.

AMENDMENT: In certain circumstances, such as when we take the timeless perspective, reference is to worms rather than stages.

Objection: But you said things didn't coincide; now that we refer to worms, worms coincide! Reply: our anti-coincidence intuitions are based on the sense of coincidence in which they do coincide.

Objection: This should be true, but it's not. (M) There is some set, S, such that S has finitely many members, S contains every coin or lump of copper that ever exists, and no two members of S ever exist at the same place at the same time. The

best a stage theorist can do here is to claim that intuition is well enough served by pointing out that each of the following sentences has a reading on which it is true: (M1) There is some set, S, such that S has finitely many members and S contains every coin or lump of copper that ever exists, and (M2) No two coins or lumps of copper ever exist at the same place at the same time.

2.3.5 Amplifications

1) With each (disambiguated) name we would associate a certain property of person stages. The referent of that name, relative to any time (in any possible world) would be the one and only stage that has the property. This property may be thought of as being something like an individual concept.

2) Baptism, and then I-relation to the baptized stage.

3) The meaning of an *n*-place predicate should be taken to be an *n*-place relation over stages.

4) De re temporal predications of properties to stages. De dicto temporal claims about propositions that were true which quantify over past stages.

2.4 Sider — Four Dimensionalism

Thesis: Four-dimensionalism (perdurantism) is true, because of an argument from vagueness.

2.4.1 What is four-dimensionalism?

Two primitives: a part at a time, and existing at a time. A part at a time is familiar; taking the atemporal notion as basic, $\Box$(x is a part of y at t iff x and y exist at t, and x's temporal part at t is part of y's temporal part at t). Of course, the three-dimensionalist won't like this, since she thinks temporary parthood is irreducibly temporal. The 3Dist can claim not to understand the 4Dist's notion of parthood, since it relies on the primitive notion of atemporal parthood. Ted will take as primitive temporary parthood to appease both sides. This means we'll talk of overlap at a time, and being a fusion at a time. Also existence at a time: x exists at t iff x has a temporal part at t.

The Heart of 4Dism. Just as things have arbitrary spatial parts, they likewise have arbitrary temporal parts. For any way of dividing up the lifetime of an object into separate intervals of time, there is a corresponding way of dividing the object into temporal parts that are confined to those intervals of time.

> x is an instantaneous temporal part of y at instant $t =_{df.}$ i) x exists at, but only at t, ii) x is part of y at t, and iii) x overlaps at t everything that is part of y at t

The temporal part of x at time t is sometimes defined as the part of x that exists only at t and has the same spatial location as x; but I distrust the appeal to spatial location. The idea is to insure that the temporal part of x is a "big enough" part of x; but the spatial definition fails for objects without spatial location; moreover, it would also fail if an object had multiple parts that had the same spatial location as it (if an object had as a part a "trope" corresponding to its shape, this should not turn out to be a temporal part of that object).

Four-dimensionalism is the endorsement of:

> **Thesis of Temporal Locality**: Necessarily, for any object x, and for any non-empty, non-overlapping sets of times T1 and T2 whose union is the time span of x, there are two objects x_1 and x_2, such that i) x_1 and x have the same parts at every time in T1, ii) x_2 and x have the same parts at every time in T2, and iii) the time span of x_1 = T1, while the time span of x_2 = T2.

Questions of priority, reducibility, etc., are important questions about temporal parts, but they must be separated from the more basic question of whether temporal parts exist at all. It is minimal four dimensionalism that is Ted's concern.

2.4.2 What is three-dimensionalism?

Usually put that objects are wholly present at each instant t. That is, every part of it must exist at t. But every part at what time must exist at t? (Ted thinks that for 3Dists parthood is temporally relative.) If t, then it's trivial. If all times, then gain and loss of parts is impossible If any other time, when?

Not (WP_3) 'Necessarily, there are no temporal parts', because instantaneous objects can exist, and they'd be temporal parts of themselves. Not (WP_4) 'Necessarily, nothing that exists for more than an instant ever has a temporal part', since instantaneous statues are temporal parts of lumps. Not (WP_5) 'Necessarily, for any object x, and for any non-empty, non- overlapping sets of times T1 and T2 whose union is the time span of x, there are NO two objects x_1 and x_2, such that i) x_1 and x have the same parts at every time in T1, ii) x_2 and x have the same parts at every time in T2, and iii) the time span of x_1 = T1, while the time span of x_2 = T2', since a lump could be made into one statue, then instantaneously altered to a different statue, then annihilated; both statues have the same parts as the lump. Not (WP6) 'In the actual world, small particles (e.g. electrons) are wholly present throughout their lifetimes', since it's only about small particles, and it's too bold (what if we found out they gained and lost parts?). Not (WP_7) 'It is possible that some object is wholly present at more than one time', since it doesn't contain a universally applicable, positive claim about the essential nature of identity over time.

So let's just say that 3Dists reject the Thesis of Temporal Locality. (This is before Crisp and Smith's "Wholly Present' Defined'.)

2.4.3 In Defense of 4Dism

Parallel to the argument for unrestricted composition. Which is: the question of whether composition occurs can be stated in a non-vague language, so it cannot have a vague answer. Any plausible way of restricting composition must be vague. So, composition is unrestricted.

But restrictions on composition are fill-ins for "A class S has a fusion iff _____". But composition might be brute (no natural, finite, statable restriction).

Ted's Argument. If not every class has a fusion, then we can consider two possible cases, one in which composition occurs (my body) and another in which it does not (my body after 1000 years of decomposing), which are connected by a continuous series of cases. Since composition can never be vague, there must be a sharp cutoff in this series of cases where composition abruptly stops occurring. But that is implausible. So composition always occurs.

P1: If not every class has a fusion,then there must be a pair of cases connected by a continuous series such that in one, composition occurs, but in the other, composition does not occur. P2: In no continuous series is there an abrupt cutoff in whether composition occurs. P3: In any case of composition, either composition definitely occurs, or composition definitely does not occur

Deny P1. Option 1: Nihilism — implausible b/c of gunk. Option 2: impossibly continuous — implausible b/c our only counterexamples are finite to infinite cases.

Deny P2. Option: precise topological restrictions — implausible b/c it rules out galaxies and probably bodies and tables.

Defending P3. Take the class of concreta. Does it include the fusion of all concreta? If it is indeterminate how many concrete things there are, then either the logical connectives or the predicate 'is concrete' are indeterminate. But neither. So P3.

2.4.4 From unrestricted composition to 4Dism

Terminology: An *assignment* is a function from times to classes of objects existing at those times. *x* is a *D-fusion* of an assignment *A* iff, for every time *t* in the domain of *A*, *x* is a fusion-at-*t* of the members of the class of objects assigned to *t* by *A*. A *minimal D-fusion* of an assignment *A* is a D-fusion of *A* that exists only at the times in the domain of *A*.

Then there's the SCQ of D-fusions: given various times and various objects corresponding to each, under what conditions will there be some object that at the various times is composed of the corresponding objects? Another question: what are the conditions under which there would be such an object that existed only at the specified times (a minimal D-fusion)?

More simply: under what conditions to objects begin and cease to exist?

Argument from vagueness. Thesis: all assignments have minimal D-fusions; there is no restriction on minimal D-fusions. Replace 'composition' in the above vagueness argument with 'D-fusion'.

The new P1 is as obvious as the old. One could respond to the new P2 with mereological essentialism. Or restrict D-fusions to continuous intervals, but Ted accepts temporally gappy existence. Or restrict them to non-instantaneous intervals, but it seems unmotivated. Either way, you can restrict minimal D-fusions.

Argument for the new P3 is also the same as the old. Four situations: i) Indeterminacy as to whether some objects have a fusion at a given time, say, because they are moderately scattered at that time. In other possible worlds that is the closest they get, and there's count indeterminacy. (ii) Indeterminacy in whether an object which is a fusion at *t* of certain particles is identical to an object that is a fusion at some other time, *t'*, of some other particles. (iii) Indeterminacy in when an object begins to exist. Go to a world in which everything is annihilated right after the statue indeterminately starts to exist. (iv) Just like the above.

The new P1-P3 entail that every assignment has a minimal D-fusion. If every assignment has a minimal D-fusion, then 4Dism is true.

2.5 Sider — *Four-Dimensionalism* Chapter 2: Against Presentism

Thesis: To explain and defend the B-Theory of Time

2.5.1 Ontology and Tense

Presentists and eternalists, A-Theorists and B-Theorists, Tensers and De-Tensers. B-theorists insist that we can't read off ontology from tensed language; for every tensed sentence token, we can give tenseless truth conditions. Thus tense words are like indexicals. Reducers of tense must be eternalists, but some eternalists don't reduce tense (moving spotlightists). Presentists use tense operators: 'there were dinosaurs' doesn't mean that there are some dinosaurs such that they used to exist, but that: it was the case that the proposition that there are dinosaurs is true.

Some deflate the debate between presentists and eternalists, since both admit tensed talk. One can map eternalist sentences (there are (tenseless) dinosaurs) to presentist sentences (WAS(there are dinosaurs) or IS(…) or WILL(…)). But the eternalist will accept, while the presentist rejects, 'there are dinosaurs and computers'. Also, this would deflate too many debates: math, modality, etc. We can frame the debate in terms of what exists *simpliciter*.

The moving spotlight is unmotivated; why keep the past and future objects but not use them to reduce tense? It answers the problem of temporary intrinsics, but only with some crazy additional theses. Prior's argument for presentism — if tenseless facts exhaust reality, how does it make sense to say 'thank goodness that's over'? Perry's argument of the shopper realizing he's making a mess, does it show that we need indexical language? We could parody Prior's argument with spatial and personal facts. Ted's Reply: we should build temporal perspective into propositional *attitudes*, not propositions. Temporal propositions are functions from times to atemporal propositions.

The growing-blockers must accept two tenses of tense: one eternalist-style in terms of the manifold, and one presentist-style in terms of the growth of the manifold. Tooley wants to deny the latter by indexing quantifiers to times. But then he can't say that anything exists *simpliciter*, even the world or the present.

2.5.2 Presentism and Cross-Time Relations

The presentist's use of tense operators means that she must talk of times one at a time. But what about sentences comparing things at different times?

How to say, 'Some American philosopher admires some ancient Greek philosopher'? Not: '$\exists x \exists y$(x is an American philosopher and y is an ancient Greek philosophers and x admires y'. Not: 'WAS:$\exists x \exists y$(x is an American philosopher and y is an ancient Greek philosophers and x admires y'. Perhaps: '$\exists x$ (x is an American philosopher and WAS: $\exists y$(y is an ancient Greek philosophers and x admires y))'. But then the admiration occurred some time in the past. Also we have a problem saying 'there were two kings of England named George', since they weren't alive together.

The presentist cannot make use of span operators. They believe it is necessarily always the case that there are only present things. But if they only use span operators, they have to admit 'WAS:$\exists x,y$(x=Kant and y=Aristotle). But that is inconsistent with presentism. So, she must use slice operators. But how to talk about sentences concerning multiple times. Option: say they're false, but provide underlying truth. Other option: paraphrase.

Problem: what about sentences about things' spatial locations? We need them for physics. Option: be substantivalists about space. Problem: science only requires relative positions. (There is an extensive argument for this, but it's difficult to summarize; read the relevant section.)

2.5.3 Presentism and Truthmakers

Questions the legitimacy of tensed sentences. 'There were dinosaurs' is true, and means 'WAS: $\exists x$(x is a dinosaur)'. But what grounds it? Not dinosaurs…

How to make the objection precise? Option: truthmaking: for every truth p, there exists an x such that x suffices for the truth of p. But what about negative existentials? Option: TSB: what things are true supervenes on what objects exist and what properties and relations they have. Whatever principle, truths shouldn't float free of the way the world is. "For the presentist, all states of affairs are currently existing, but the truth about the past isn't fixed by facts about the present".

Option 1: laws of nature and properties now entail the past. Problem: regularity theories fail, since they can't both ground and be grounded by the tensed facts; the presentist should think laws are relations between universals. Another problem: implies the past is open, because the laws might be present-to-past indeterministic. Even if they're not, if Russell's theory of motion (at-at) is right, the open past might be true, because present properties won't fix velocities; the presentist must reject at-at.

Option 2: cheat. Incorporate the tense into the properties or relations of present objects. Truthmaker and TSB are supposed to rule out dubious ontologies that posit brute dispositions, brute counterfactuals, grounding laws in properties of objects (being such that Fs lawfully must be Gs), believers in one spatial point and spatial 'tense' operators, and solipsists with personal 'tense' operators.

Claim: presentists cheat like this. Reason: irreducibly hypothetical properties (ones that 'point beyond' their instances) are invoked, where a proper ontology should invoke only categorical properties. This is an argument against taking modal operators as primitive as well. Lewis is motivated by this, and reduces modality. B-theorists reduce temporality, by quantifying over non-present things.

2.5.4 Presentism and Special Relativity

Assumption: presentists want to be consistent with something fairly close to current physics.

Newtonian spacetime is a 4-dimensional manifold, one hyperplane of which is the present, and it has well-defined simultaneity relation, and it's an equivalence relation. Minkowski spacetime is also 4-dimensional, but no well-defined simultaneity. There are absolute future (inside the light cone), absolute past (inside the light cone), and spacelike separation (outside the light cone). There is simultaneity relative to frames of reference, which depend on position and motion.

Thesis: there is no plausible presentist/Minkowski hybrid. Type 1: here-nowism. Only one point exists. But tense operators must be abandoned, or indexed to reference frames; and the truthmaker objection becomes even more difficult; and it's super-solipsistic. Type 2: privilege one hyperplane arbitrarily, and say that all

things on that hyperplane exist. But it's too scientifically revisionary — Minkowski *says* that if I snap my fingers there are events such that there's no fact of the matter whether they are simultaneous, but the Type 2ist can't say that. Type 3: retain 4-dimensional regions. Presumably not the past or future light cones, so probably the spacelike separated one. But instantiation will have to be relativized, since reality will contain multiple points along objects' worldlines; also, one point is privileged.

2.6 van Inwagen — Four Dimensional Objects

Thesis: It is oft said that there are two theories of identity across time — 3dism and 4dism. But there are three. Peter shall endorse one (theory 3). They are theories about how our names are related to the occupants of regions of spacetime. Peter will defend theory 3 from the incoherence charge and argue that theory 2 commits proponents to counterpart-theoretic analyses of modal statements.

Take some object, Descartes. Make a model of him through time; the region of spacetime he occupies is R. R_1 and R_2 are subregions of R with 0 temporal extent. Some will say R_1 is occupied by the largest part of Descartes at t_1, while others will say R_1 is the region occupied by Descartes at t_1.

Theory 1: If you say, 'Descartes was hungry at t_1', 'Descartes' refers to a three dimensional object that fits exactly into R_1 and occupies no other spacetime region. If you say 'Descartes was thirsty at t_2', 'Descartes' refers to a distinct three dimensional object that fits exactly into R_2 and occupies no other spacetime region. The relation between the referents of 'Descartes' and 'Descartes' is not identity, but gen-identity.

Theory 2: 'Descartes' always refers to the 4-dimensional whole that occupies R. 'Descartes is hungry at t_1' ascribes hunger to the part of Descartes at t_1.

Theory 3: 'Descartes' always refers to the 3-dimensional thing, which is identical to the thing at t_1 and t_2.

Proponents of T2 and T3 agree that the referent of successive uses of 'Descartes' is numerically identical. Proponents of T1 and T3 agree that 'Descartes' refers to a 3-dimensional object.

2.6.1 4 Arguments that T3 is incoherent

1. What exactly fills one region of spacetime cannot exactly fill another! Reply: What exactly fills one region of space at a time cannot fill a distinct region at the same time, surely enough. But why believe the spacetime principle?

2. Does a part of Descartes occupy R_1, or all of him? If the former, you are a T2ist. If the latter, well, obviously he's not all in there! Reply: You haven't explained 'part

of' and 'all of', so I'll say it's Descartes himself.

3. T3 requires time-indexed properties or 3-term instantiation. But we can't make sense of those — they're mysterious, and needlessly so. Just like spatial parthood, temporal parthood makes more sense. Reply: One can maintain that 3-term instantiation is primitive, and more fundamental, and I do so! Usually to say that *x* had F is to say that *x* had F at *t*, for all *t*. Sometimes to say that *x* had F is to say that *x* had F at *t*, for some important class of times. I agree that spatial parthood makes more sense; why should I think that time is spacelike in that way?

4. What occupies R_1 is clean-shaven. What occupies R_2 is not. So, the two are not identical. Reply: R_1 and R_2 are indices for the copula. I can say truly, "I was bearded at 1973". Rejoinder: 'I' occupies 1973; when? Reply: When is the proposition that I was born in 1960 true? If you answer that, I'll adopt the same answer. Rejoinder: So Descartes occupies R_1 and R_2. What occupies R? What properties does it have? Reply: Perhaps nothing occupies R. Or perhaps it's the mereological sum of the occupants of R_1 and R_2 and all the slices in between; which is just to say that it's Descartes! He was human, French, wrote the *Meditations*…I mean, he had different properties at different indices, which I could also tell you. If you treat R as an index, then the properties he had-at-R are the properties he had at every moment he existed.

2.6.2 Against T2

Objection: Objects are sums of temporal parts. Descartes had a temporal extent of 54 years; intuitively he didn't have it essentially. But if Descartes is just an aggregate of temporal parts, how can we make sense of that?

Bad Reply: Same parts, different temporal extent of the parts.

Better Reply: He'd have been a sum of different temporal parts. Temporal parts have their temporal extents essentially.

Objection: Descartes is composed of temporal parts, all of which have their temporal extents essentially. But Descartes is one of his temporal parts — the largest

one. So he has his temporal extent essentially. This is obviously false, so T2 is wrong.

Re-stated: Descartes has a first half. Suppose Descartes had been annihilated halfway through his life. Would he have been the object that is his first half? It seems so. But how could numerically distinct things have been identical?

Implication: The 21st must be a counterpart theoretician. There are at least two counterpart relations: person and temporal-part. x is a temporal-part counterpart of y only if x and y have the same temporal extent. For some person x, y is a person counterpart of x only if y is (like x) a maximal aggregate of temporal parts of persons. Any person S could have had a longer temporal extent (*qua* person), but could not have (*qua* temporal part). This is a good reply to the objection, but requires counterpart theory.

2.7 Zimmerman — Temporary Intrinsics and Presentism

Thesis: I have no more properties than those I have now.

First Reply: is the the first 'have' tensed? If so, tautology! If not, then obviously false; things change!

Dean's Reply: Tensed vs tenseless truths. Do truth-bearers change their truth-values? A serious-tenser says yes, and that tenseless truths are disjunctions of more fundamental tensed truths. Presentists are serious-tensers. The presentist thinks we should be ontologically committed to present things; she is a temporal actualist. But how to say 'there was a person who doesn't now exist'?

One strategy: individual essences. 'There is an essence not now exemplified that was exemplified'. Another strategy: 'it was the case that there is someone not identical to [list every present person]'. Regardless, the presentist must be committed to tenseless truths about non-present things being equivalent to tensed statements that are not.

Nobody should reject presentism and take tense seriously. Anyone who has the serious-tenser intuition (that the past is over) should be a presentist. Quentin Smith is a non-presentist serious-tenser; he strips past and future things of their interesting intrinsic properties. Dean thinks this makes them too ghostly.

2.7.1 Why Lewis Rejects Presentism

Presentism is too incredible to be believed; it rejects endurance (since it rejects persistence), and goes against what we believe by denying that there are other times. PC: There are at least two different times, one at which I'm bent and one at which I'm straight. Presentism is incompatible with PC. Smith's view is not, but it's crazy.

In order to buy Lewis, PC must (i) be something we all believe on reflection and (ii) require ontological commitment to more than one time. Certainly (ii) is false; we allow for paraphrase in the case of dearths, nonactual possibilities, and times. Which paraphrase? Candidate 1: PC expresses a disjunction of tensed truths 'Either I was bent and would become or had previously been straight, or I was straight and would become or had previously been bent, or I will be bent and will have been or be about to become straight, or I will be straight and will have been or be about to become

bent'. This is true if PC is true.

Tu quoque: Not even Lewis accepts PC without paraphrase; he says 'there is a time at which I have a temporal part that is bent'. If his paraphrase works, so does mine. Lewis needs to give specific reasons it doesn't.

Other serious tensing problems: McTaggart, the rate of time, relativity. But they are distinct, and should be explored.

2.7.2 Postscript: B-Theorist Serious Tensers?

The distinction: (i) a metaphysically thin thesis about the significance of tensed language (for which I now reserve the term "taking tense seriously"), and (ii) a thesis common to A-Theories. The question: can serious-tensers answer Lewis the way Dean does?

A-Theorists and B-Theorists. Past, present, and future vs earlier, simultaneous, later. Debate is over which is basic/fundamental.

'Taking Tense Seriously'? A-Theory and B-Theory is often thought of as a dispute between tensed and tenseless theories of time. But tense is a linguistic feature, and time is not a part of speech. So…

'Taking tense seriously' is to think that temporally perspectival positions are ineliminable features of our explications of propositional attitudes and their linguistic expression. Temporally perspectival propositions are propositions that aren't immutable with respect to truth-value; the opposite is eternal propositions. Some B-theorists take tense seriously.

Tensed and tenseless verbs. Sentences with tenseless verbs express eternal propositions. And there are mechanisms for generating tenseless sentences, such as 'at some time or other' and 'at all times'.

De-tensing. De-tensing says that for any tensed sentence expresses an eternal proposition. But which one? There should be tenseless sentences that express the same. One suggestion is that the date is smuggled in. Another is that the

utterances are token-reflexive. Now, most agree that more than eternal propositions are required in telling the full story of what we mean by tensed sentences, and in describing the contents of beliefs typically expressed using tensed verbs. Some still offer an eternal proposition as the meaning, and then add some other semantic value to explain the difference (Perry's content-sub-m, Kaplanian character, Stalnaker's diagonal prop).

Temporarily True Propositions. These are what serious-tensers believe in. Tensed sentences express propositions that change their truth values over time. Lewis insists that this is because we say perspectival things, and it shouldn't impact our metaphysics of time — eternal propositions give a complete description of reality. We might need A-propositions, but God doesn't. The eternal propositions are true *simpliciter*, and the temporary ones are only true relative to times.

Metaphysics of Propositions and Nonrelative Temporary Truth. Propositions play the similarity of meaning role. Any ontology of propositions will do for either theorist. The B-theorist accuses the A-theorist's propositions of being properties of times. But they need't be. Dean's other thesis: the eternalist A-theorist must appeal to truth *simpliciter* to distinguish herself from the B-theorist.

Can the B-theorist use this paper? If the serious tenser B-theorist is to stop Lewis's argument at the same point as the presentist, he must derail it at the first step, denying that it is true that I have both being bent and being straight. But which should he choose? A-Theorist: It depends upon whether bent or straight is my present shape. The B-theorist cannot choose being bent or being straight on this basis; he'll have to arbitrarily decide (whatever shape Dean has now).

3 Composition and Mereology

3.1 Merricks — *Objects and Persons* Chapter 3: Epiphenomenalism and Eliminativism

The Overdetermination Argument (OD):
1) The baseball — if it exists — is causally irrelevant to whether its constituent atoms acting in concert cause the shattering of the window.
2) The shattering of the window is caused by those atoms acting in concert.
3) The shattering of the window is not overdetermined.
4) If the baseball exists, it does not cause the shattering of the window.

3.1.1 The Causal Principle

Suppose the members of an unruly mob cause vandalism. The vandalism is not overdetermined. I am causally irrelevant to whether the members cause the vandalism.

Causal irrelevance: a) I am not one of the members. b) I am not a partial cause of the vandalism along with the members. c) I am not an intermediate in a causal chain between the members and the vandalism. d) I do not cause any of the members to cause the vandalism. Given (a)-(d), I do not cause the vandalism. This is a result of the following principle:

Causal Principle: Suppose O is an object, the *x*s are objects. O is causally irrelevant to whether the *x*s acting in concert cause E (in the sense of (a)-(d)). The *x*s acting in concert cause E. And E is not overdetermined. Thus: O does not cause E.

An effect E is overdetermined if: (i) E is caused by an object O, (ii) O is causally irrelevant to whether something or some things numerically distinct from O causes E, the other things do cause E. *Causal Principle* implies that OD is valid.

3.1.2 Atomic Causation

Concerning (1). Suppose the atoms only partially cause the shattering, and the full cause includes the baseball; then (1) is false. But this is not like two rocks shattering a window together; a baseball cannot do more work than its atoms. Suppose the atoms cause the baseball to cause the shattering; then (1) is false. But this is not like being a middle domino which is caused to cause the third domino to fall. And the baseball doesn't cause the atoms to cause the shattering — no downward causation. And if the baseball at an earlier time causes the atoms at a later time to cause the shattering, then the atoms at the earlier time cause the atoms at the later time to cause the shattering. So, the baseball is causally redundant.

Concerning (2). Each atom causes something, and the cumulative effect of all the causes of all the atoms is the shattering. Objection: The argument shows that if the baseball shatters, the atoms don't. The baseball does! So the atoms don't. Reply: The atoms have causal effects before they compose (and the baseball doesn't), so they ought to have causal effects after. Objection: The baseball shatters the window, and the atoms shatter the window atoms. Reply: These are two descriptions of the same event. But there are multiple scatterings. The atoms have multiple effects — the multiple scatterings. The most reasonable thing to say is that in addition to the multiple scatterings, they cause the shattering. If some objects cause the *e*s, and the *e*s compose *v*, those objects cause *v*. Objection: only events cause things. Reply: There are different senses of causation, and we can paraphrase.

3.1.3 Causal Overdetermination

Concerning (3). Overdetermination is ugly when we think about mental events causing physical events only by overdetermining them. And the reasoning behind OD extends to many cases; so one who rejects (3) must embrace massive overdetermination. Or, try to make a principled case why some kinds are okay.

Option: an effect is psudeo-overdetermined if it's caused by an object and an event in which that object participates. So, the baseball and the baseball's striking the window. Reply: what it is for a baseball to shatter a window is for it to participate in a window-shattering event. So psuedo-overdetermination is not overdetermination.

Objections to systematic overdetermination are not objections to systematic psuedo-overdetermination. Objection: what it is for a baseball to shatter is for its parts to shatter; so, it's psuedo-overdetermination. Reply: consider 'O's causing E is analyzed as O's participating in the right way in an event that causes E'. But this is circular, unless there are two kinds of causation. But a baseball and its atoms do the same kind of causal work. So baseballs and atoms causing shatterings is not psuedo-overdetermination.

Objection: overdetermination is only bad if the overdetermining causes are not wholly separate; baseballs are not wholly separate from their atoms, so it's not bad. Reply: even if mental properties supervene on physical properties (and thus they're not wholly separate), their overdetermining is bad.

Supporting (3). Imagine a person is killed by a bullet, and entertain the possibility that the killing is overdetermined by two bullets arriving simultaneously, and suppose their is no reason to think the killing is overdetermined, since there's no evidence for a second bullet. We should deny the killing is overdetermined, in absence of evidence that the effect is overdetermined. We should accept overdetermination of shattering only if we have good reason to think baseballs exist. And we don't. And agnosticism about baseballs leads to denial of baseballs.

'Just seeing' isn't a good reason, since we'd think we 'just see' even if we didn't; we need positive reasons. Perhaps they are 'part of our common sense metaphysics'. That's a good starting point, but it's defeasible, in part because of OD, and in part because we'd 'just see' baseballs even if they didn't exist.

Once we move to philosophical reasons for believing in baseballs, things look even better for eliminativism. The best arguments for baseballs are arguments for unrestricted composition, especially with the addition of perdurance and the inconstancy of modal predicates.

But eliminativism and unrestricted composition are equally good answers to the argument from vagueness, the only good argument for unrestricted composition. And since 'just seeing' isn't a good argument for the existence of baseballs, we have no reason to believe in them. So eliminativism wins.

3.1.4 The Moral of OD

Generalizes: 1) O — if it exists — is causally irrelevant to whether its parts the Ps acting in concert cause E.
2) The Ps cause E.
3) E is not overdetermined.
4) If O exists, it does not cause E.

If a bottom-up metaphysics is true and macroscopic objects exist, they do not cause anything. But certainly if macroscopic objects exist, they'd cause *something*! Same with events. And co-located objects.

3.2 Merricks — *Objects and Persons* Chapter 4: Surviving Eliminativism

We are not co-located with human organisms (otherwise we would have the same thoughts as organisms, but never know if we are the organism that thinks it's a person, or actually a person). But we can be seen and held just as organisms can. So, we are identical with human organisms. The motivation is not a biological criterion of personal identity, but a denial of co-location. The reason I think I can be touched is that it seems true. But, perhaps the arguments that refute folk ontology refute the claim that we are human organisms. Our justification for believing we are human organisms is undermined when we realize our sensory experience would be the same if we weren't. This only works if we have additional arguments against our being human organisms. You might think one is that our atoms overdetermine what we cause. But they don't.

3.2.1 Step One

(1) There is some intrinsic property F such that: (a) An object's existing and being F is not necessarily implied by the existence and intrinsic properties of, and spatiotemporal and causal interrelations among, that object's constituent atoms, and (b) Humans cause things in virtue of (existing and) being F.
(2) If (1) is true, then there is some property F such that a human's causing effect E in virtue of (existing and) being F does not all by itself give one a reason to believe that that human's constituent atoms cause E in virtue of their intrinsic properties and spatiotemporal and causal interrelations.
(3) Therefore, There is some property F such that a human's causing effect E in virtue of (existing and) being F does not all by itself give one a reason to believe that that human's constituent atoms cause E in virtue of their intrinsic properties and spatiotemporal and causal interrelations.

Defending (2). Suppose O's atoms fixed of necessity O's causally relevant properties. It would be tempting to think O's casual powers couldn't outstrip the atoms'

powers. But suppose they cold. Then O's causal powers would be independent of its atoms' causal powers. At least, that's the case if the property is intrinsic; it it's a relation between the object and its atoms, then one might argue that the atoms do the causing.

Basically, if O's atoms don't determine that O is F, then O's causing E by being F doesn't give us reason all by itself to think the atoms cause E.

On intrinsic properties. O's intrinsic properties are the ones O can have even if it's the only thing in the world. Being intrinsic must not be analyzed as being a property whose exemplification by O supervenes on the intrinsic features of the atoms composing O, since that would make (1) false. Thankfully, it's a bad analysis since it's circular.

Defending (1a). Conscious mental properties are intrinsic. And we can show (1a) if: the existence of an object with an intrinsic conscious mental property is not entailed by the intrinsic properties and spatiotemporal and causal interrelations of that object's constituent atoms. (1a) is true if the following is false:

Consciousness (C): Necessarily, if some atoms $A_1 \ldots A_n$ compose a conscious object, then any atoms intrinsically like $A_1 \ldots A_n$, interrelated by all the same spatiotemporal and causal interrelations as $A_1 \ldots A_n$, compose a conscious object.

But (C) is false for Tibbles and Tibb style reasoning.

Objection: But Tibbles atoms don't have all the same spatiotemporal and causal interrelations before and after the amputation. Reply: fine, just remove one atom.

Objection: If 4Dism is true, then persons are four-dimensional, and the Tibbles/Tibb reasoning doesn't show that (C) is false. Reply: We should reject a 4D version of (C) as well, (4DC): Necessarily, if some atomic temporal parts $A_1 \ldots A_n$ compose a conscious object, then any atomic temporal parts intrinsically like $A_1 \ldots A_n$ interrelated by all the same spatiotemporal and causal interrelations as $A_1 \ldots A_n$ compose a conscious object. If we can show (4DC) is false, then we show that (4D1a) is true: There is some intrinsic property F such that an object's existing and being F is not necessarily implied by the existence and intrinsic properties of and spatiotemporal and causal relations among that objects constituent atomic temporal parts.

4DC is false. Consider two persons, one who lives 80 years, one 90, microphysically alike for the first 80 years. 4DC implies that the atomic temporal parts of the second compose something just like the first. But they don't, since there is only one conscious object there, and it lives for 90 years. Some will deny this, but they only provide a reductio against their view.

Objection: C is false, but conscious mental properties are not intrinsic, so (1a) doesn't follow from the denial of C. In fact, the denial of C gives us good reason to think mental properties are relational. Reply: If they're relational, they depend on some crazy insignificant relations, like between my fingers.

Objection (Ted Sider): Conscious mental properties are not intrinsic, but bear the mark because they are maximal. What it means to be conscious is to be psuedo-conscious and not part of a larger conscious being. So part of the meaning of being conscious is relational. Reply: this is just a notational variant of allowing the large proper parts to be conscious. But it allows him to say that 'only one conscious being is wearing my shirt' is true. Still, the fact that it is merely a notational variant is good enough reason to reject it, since the problem is not the notation but the ontology. Also, the view has it that we can't tell whether we're conscious.

Defending (1b). So, there is some intrinsic property F such that: (a) An object's existing and being F is not, of metaphysical necessity, implied by the existence and intrinsic properties of, and spatiotemporal and causal interrelations among, that object's constituent atoms. The intrinsic property in question is a conscious mental property. So if (1b) is true, it is in virtue of having some conscious mental property that humans cause things.

Step One can't save statues or the like, since very few properties satisfy (1). Quidditative properties don't satisfy (1b), even causing the belief 'that is a statue', since the atoms would cause that belief also. It might make it true, but truthmaking is not causal. Mass does not satisfy (1a). Composition (supposing it's primitive) seems to, but we have no reason to suppose it's primitive, and we do have reason to believe C is false.

3.2.2 Step Two

(3) does not, on its own, show that we should deny or even withhold belief on the claim that everything a human organism causes is also caused by its constituent atoms. Nor does it suggest that a human is causally relevant to what its constituent atoms cause. Thus (3) alone does not show that either (1*) or (2*) of the schema of the Overdetermination Argument (Chapter 3, §IV) cannot be applied to all that we supposedly cause. And so it does not, on its own, save us from that argument.

We must ask whether a human's causing something in virtue of being conscious gives us a reason, all by itself, to think her atoms cause that same thing in virtue of some of their features other than their intrinsic properties or spatiotemporal or causal interrelations. The only sensible 'yes' answer is that they do so in virtue of composing a conscious person who causes something. But then they must compose a person, and the person must exist.

But still, we are left with the possibility that there is some other reason, other than the person's causing the effect, to think her atoms cause that effect. We have good reason to think atoms cause E, but that the person causes the atoms to cause E. But this is not overdetermining, because overdetermining causes must be causally irrelevant to one another.

Objection: you insist that everything a baseball would cause — if it would cause anything at all — would be caused by its atoms. Moreover, you insist that the baseball is causally irrelevant to what those atoms cause. If you insist on such claims regarding baseballs, you ought to accept them regarding humans as well. Reply: I argued that the existence of some objects (those with conscious mental properties) doesn't supervene on the microphysical. We have those properties.

So, (6): If a person causes E in virtue of existing and having a conscious mental property, then E is caused by her constituent atoms only if she is causally relevant to whether the atoms cause E (or cause E by way of composing a person that causes E in virtue of having a mental property).

OD does not render human persons epiphenomenal. So, OD does not eliminate us. Only things that lack non-redundant causal powers. So dolphins and us exist, maybe trees and ants. Wherever causal powers emerge. So, to be is to have non-

redundant causal powers (for material objects).

3.3 Rea — In Defense of Mereological Universalism

Part I: Reply to PvI
Part II: Argument for Universalism

3.3.1 Peter's Argument

(A) I exist now and I existed ten years ago. (B) I am an organism, and I have always been an organism. (C) Every organism is composed of some atoms at every moment of its existence. (D) It is true of any organism that existed ten years ago and still exists that the atoms that composed it ten years ago still exist. (E) None of the atoms that now compose it are among those that did 10 years ago. (F) If U is true, then some *x*s can never compose two objects either simultaneously or successively.

Mike's Reply. (F) is false.

Peter's Defense of (F). Consider some blocks. They compose the Salisbury Cathedral. They always compose something. If their arrangement is irrelevant to the fact that they compose, it should be irrelevant to what they compose.

Mike's Reply. Why think that?!

Peter's Reply. Consider the blocks moving rapidly toward each other. How long does an object composed of them last? Either it's instantaneous, or it lasts as long as the blocks do. Otherwise, too arbitrary. And the first can't be right; it's *positional essentialism*, where all the same blocks have to be in all the same places in order for an object to exist.

Mike's Reply. False dilemma. The blocks always compose an aggregate — Fred. But when the blocks are arranged statue-wise, they compose an aggregate that is not Fred but rather the statue. Fred exists as long as the blocks don't compose something more interesting than Fred.

3.3.2 Mike's Argument.

A way of arranging objects W is kind constituting=$_{df.}$ there is an object-kind K such that an object is a K iff its parts exemplify W.

Assumption: Whether the members of a set S compose anything depends only on how they are arranged

1) For any kind K, arranging objects K-wise is both necessary and sufficient for bringing an object of kind K into existence. 2) Every way of arranging objects can be kind constituting. 3) If every way of arranging objects can be kind constituting, every way of arranging objects is kind constituting. 4) Every way of arranging objects is kind-constituting. 5) The members of every sit of disjoint objects is arranged in some way or other. 6) Therefore, the members of every set of disjoint objects compose something. (I think he means, for every set of disjoint objects S, the members of S compose something.)

Defending (1). Objections are probably to the sufficiency. Two examples. First, the parts of Tibb are arranged catwise, but they were before Tibbles lost her tail. Second, lightning couldn't create a statue.

Against (1), arrangements also depend on spatial and causal relationships with nearby objects. Against (2), *work of art* is not a genuine kind, because it violates Assumption.

Defending (2). Reason: any type of organization can count as functional organization. Reason: functional organization is at least sufficient, since it is because objects serve some function that they count as parts. The example is of lives and computers. And if we count computers, we must count every non-living thing. So every type of organization is kind-constituting.

Defending (3). Suppose that two men shaking hands don't compose anything. But it could; we'll stipulate that the object kind 'handamen' is exemplified iff there are two men shaking hands. So, are there handamen? Yes. Have there always been? Yes.

Call the conjunction of (1) and (4) 'Aristotelian Universalism'. Rejecting (1) or (3) will probably lead to conventionalism. Conventionalism is more reasonable than rejecting (5), but less reasonable than rejecting (2). (why?) But we shouldn't reject (2), since that would commit us to there being a metaphysically important distinction between types of organization that make only some kind-constituting. And the only reasonable one if life and non-life. But there are computers.

Objection. Consider KM: For any kind K, there is a set S of properties such that, necessarily, for any *x*, *x* is a K iff *x* constitutes something that has the members of K essentially. Basically, wherever there's a K, there's something that has the essential properties of a K. The conjunction of KM and AU entails the possibility of co-location. There are as many object-kinds as types of organization.

We should reject KM in favor of KM*: For any kind K, there is a set of properties S such that, necessarily, for any *x*, K is *x*'s dominant kind iff *x* has the members of K essentially.

K is *x*'s dominant kind $=_{df.}$ *x* belongs to K and any term that refers to K is a metaphysically better answer to the question 'What kind of thing is *x*?' than any term that does not refer to K.

KM* allows things to belong to more than one kind, even when the kinds have different associated essential properties. So, there's a statue and clay, and they're the same thing — the thing has the essential properties of its dominant kind, statue.

This commits us to: for any filled region of space R, there are better and worse answers to the question 'what kind of thing fills R?'

3.4 van Inwagen — *Material Beings* Preface

Ten Assumed Theses:

1) Identity is absolute.

2) Material things endure through time.

3) Standard logic is the ideal.

4) Counterpart theory is false.

5) Matter is ultimately particulate.

6) Two objects cannot have the same parts at the same time.

7) Mental predicates require a subject.

8) The subjects of thoughts are material objects.

9) What there is is not a matter of stipulation or convention.

10) If and when composition occurs is not a matter of anything than the spatial and causal relations between parts.

3.5 van Inwagen — *Material Beings* Chapter 1: Introduction

This book is about material objects, a concept without precise boundaries. *x* is a material object if *x* occupies space and endures through time and has a surface and mass and is made of stuff. There are well-known puzzles about material objects: the ship of Theseus, the case of Tibbles and Tibb, and Lumpl and Goliath. This book will defend a radical thesis about material things.

This will have much to do with parts. Parts needn't be material; there is a relation called 'parthood' whose field comprises things like quarks and hands and chapters and events — it's a unity of analogy.

The theory developed in the book grew out of a desire to answer this question: In what circumstances is a thing a proper part of something? (The SCQ)

3.6 van Inwagen — *Material Beings* Chapter 2: The Special Composition Question

The SCQ might be phrased as 'in what circumstances is a thing a proper part of something?' But this puts our focus on different kinds of things, since proper parthood is antisymmetrical. Better: When does a group compose something? But the word 'group' is substantive. We want to be ontologically neutral as to whether there is a group/aggregate/plurality. We could use 'set', but we don't really need it. We can do all we need with plurally referring expressions. They are not quantificational, but can contain open variables. We can form sentences with them by combining them with variably polyadic predicates.

We can do the semantics the same as we normally introduce variables into our discourse — via pronouns. Use an indefinite stock of third-person-singular pronouns: it_x, it_y…Then introduce quantifier phrases like 'it is true of at least on $thing_x$ that it…' Then drop out the 'it's. We can do this with 'they' instead of 'it' just as easily. Then we can add the variably polyadic operator 'is one of', which is flanked on one side by a singular variable and on the other by a plural variable. 'the xs are among the ys'$=_{df.}$ $\forall z$(z is one of the xs$\rightarrow$ z is one of the ys).

'The xs compose y' means 'the xs are all parts of y and no two of the xs overlap and every part of y overlaps at least one the xs'. Parthood is antisymmetric, transitive, and reflexive. If there is more than one of the xs, then the xs *properly compose* y. 'y is a sum of the xs'$=_{df.}$ 'the xs are all parts of y and every part of y overlaps at least one of the xs'. (There is only one sum, but some disagree.)

Given these definitions, 'the whole is a sum of its parts' is trivial. Why do philosophers treat it as anything else? Perhaps because they use it to express the proposition that if y is a sum of the xs, then the intrinsic properties of the xs and the relations in which they stand to one another determine the intrinsic properties of y. But in fact, 'the whole is a sum of its parts' does not express that.

THE SCQ: When is it true that there exists a y such that the xs compose y?
THE GCQ: When is it true that the xs compose y?
THE FORMAL SCQ: $\Box\forall x s\exists y$(xs compose y) iff _____ .

THE FORMAL GCQ: $\Box\forall x\text{s}\forall y$($x$s compose y iff _____ .

An answer to the SCQ tells us when composition occurs. An answer to the GCQ tells us what composition is.

Can we find a sentence without mereological terms and in which no variable but 'the xs' is free and which is necessarily extensionally equivalent to 'there exists a y such that the xs compose y'? (A mereological term is one that can be given a trivial definition in terms of part, like 'overlap'.)

A version: Suppose one had some nonoverlapping objects. What would one have to do — what could one do — to get them to compose something?

This focuses the question on the xs. What multigrade nonmereological relation do I have to put them in to get a new thing? Otherwise it's a question about the xs and y, and we don't want to start thinking about y's nature.

3.7 van Inwagen — *Material Beings* Chapter 3: Contact

Contact: To get the *x*s to compose something, one need only to bring them into contact.

There exists a *y* such that the *x*s compose y when and only when the *x*s are in contact. The *x*s are in contact if they do not overlap spatially and they are clumped together. Formally: no *x*s overlap, and if *y* and *z* are among the *x*s, then *y* is in contact with *z*, or *y* is in contact with *w* which is one of the *x*s and *w* is in contact with *z*…

Contact: For any *x*s, there is a binary relation that holds between *y* and *z* iff *y* and *z* are among the *x*s and *y* and *z* are in contact. The *x*s are in contact if no two of them overlap spatially and if, for any *y* and *z* such that *y* and *z* are among the *x*s, the ancestral of the contact relation on the *x*s holds between *y* and *z*.

Against Contact: perhaps with cases of bricks and houses Contact has some intuitive appeal. But the smallest parts of the house (and the smallest parts of the bricks) wouldn't compose anything. Science tells us that electrons are not in contact. And if there are point-sized particles, they cannot be in contact.

Against Contact: if I put two ice cubes on top of each other, do they compose something? If the cue ball hits the 8-ball, is there a momentary object composed of the two of them? If we shake hands, is there a new thing composed of us? Contact forces us to give the unintuitive answer 'yes' to all these questions. And does the manner of contact matter? If we shake hands, and then tomorrow touch knees, is the same object brought into existence both times? If I lay a bunch of bricks on top of each other, then arrange them into a model, has the same object just changed a bunch of properties?

Contact is a bad answer for a few reasons. First, we have to give unintuitive answers to when things compose another thing. Second, it just seems on reflection that even if those objects exist, it is not in virtue of coming into contact with each other that they do so.

3.8 van Inwagen — *Material Beings* Chapter 6: Physical Bonding

Fastening: To get the *x*s to compose something, one need only cause them to be fastened to one another.

Contact is highly unstable; we need the *x*s to be joined to one another somehow such that most ways of applying force to a thing won't get them to separate. If a small force could cause them to lose contact, they aren't really composing.

Problem: what are 'most ways of applying force'? If we cash it out set-theoretically, the cardinality of the set of ways of applying force will be the same as the cardinality of the set of most ways of applying force.

In any case, *Fastening* is still a bad answer. What if we shook hands with super-glue, or our hands became paralyzed; is there a new object?

Cohesion: To get the *x*s to compose something, one need only cause them to cohere. That is, to get them so that you have to break one in order to pull them apart. But again, we could shake hands and cohere.

Fusion: To get the *x*s to compose something, one need only cause them to fuse. Between objects that are cohered, there is a discernible boundary; between objects that have fused, there is not. But we can conceive of scenarios in which two people's hands are cut off and then they're conjoined in a Siamese-twin manner, and it doesn't seem like the fusing brings a new object into being.

3.9 van Inwagen — *Material Beings* Chapter 8: Extreme Answers — Nihilism/Universalism

Nihilism: It is impossible for one to bring it about that something is such that the *x*s compose it because, necessarily, if the *x*s are two or more, nothing is such that the *x*s compose it.
Formally: $\Box\forall x s \exists y$(*x*s compose *y*) iff there is only one of the *x*s. This is also an answer to the GCQ: the *x*s compose *y* iff each of the *x*s is identical to *y*.

If *Nihilism* is correct, the physical world consists only of partless things (hereafter 'simples'). The partless things instantiate a very complicated multigrade relation, but it has no mereological consequences.

Unfortunately for nihilism, it rules out you and I, since we are composite objects.

Universalism: It is impossible for one to bring it about that something is such that the *x*s compose it because, necessarily, something is such that the *x*s compose it.
Formally: $\Box\forall x s \exists y$(*x*s compose *y*) iff the *x*s exist.

Against universalism: first, it does not seem to be true. Second, it conflicts with the following theses: A) I exist now and I existed ten years ago, B) I am an organism, and I have always been an organism, C) Every organism is composed of some atoms or other at every moment it exists, D) All of the atoms that composed me ten years ago still exist, E) None of those atoms now compose me, F) Composition is unique.

(C), (D), and (E) are empirical facts. (A) and (B) have been denied by philosophers before, but they seem true. In defense of (B): many philosophers think that there is a biological organism to which I stand in a very special relationship, and they call it 'my body'. I don't understand, since it has no clear meaning defined by ordinary speech or explicit definition. If you deny (A) or (B), you should ask yourself whether there are any persisting organisms, and if so, why not us?

In defense of (F): other answers to the SCQ are compatible with the denial of (F). But the universalist thinks the arrangement is irrelevant to whether some things

compose. If it's irrelevant to *whether* they compose, why should it be relevant to *what* they compose? Think about a model of a cathedral made of blocks; how long does it last? The two admissible answers seem to be (i) as long as the blocks do, or (ii) for an instant. The latter is an extreme view: positional essentialism. The universalist says there is something composed of my nose and the Eiffel Tower; is it a new thing when I move or when my nose loses atoms?

Also, universalism is not an answer to the SCQ, since it tells us that the *x*s have a sum, not that they compose something. (By definition, distinct overlapping objects compose nothing.) From *Universalism* it follows by definition that any *x*s that do not overlap compose something, but 'overlap' is mereological. But universalism is incompatible with all moderate answers to the SCQ, and with nihilism. If there were a nonmereological relation that the *x*s instantiate iff they are disjoint, then the *x*s standing in that relation would be the universalist answer to the SCQ.

If *Nihilism* is true, there is an answer to the SCQ and the GCQ. If any moderate answer is true, there is an answer to the SCQ but not the GCQ. If *Universalism* is true, there is no answer to either.

3.10 van Inwagen — *Material Beings* Chapter 9: The Proposed Answer

Parthood essentially involves causation; this is the true intuition driving the previous moderate answers. But this doesn't help much — what causal relation(s)?

Organicism: $\Box\forall x\text{s}\exists y$(*x*s compose *y*) iff the activity of the *x*s constitutes a life, or there is only one of the *x*s.

What constitutes a life? First, what is activity constituting an event? We must proceed by example: the activities of the participants constituted the parade, the activities of the students and candidates constituted the election, the activities of the cattle constituted the stampede, the activities of the water molecules in the pan constituted the cooling of the pan (so it needn't involve action). Events are particulars and cannot recur.

1) Not every event is constituted by the activities of objects, but some are. 2) It is open whether if the activities of the *x*s constitute E, there is an event E* not identical with E such that the activities of *x*s constitute E*. 3) It is open whether if the activities of the *x*s constitute E, then just any change in the properties or relations of some or all of the *x*s is in any way relevant to that event.

What is a life? Here it denotes the individual life of a concrete biological organism and takes place entirely inside the organism for as long as it's alive. Life is thus a count noun. It is the business of biology to do the further analysis (and will probably involve 'entropy' and 'enzyme').

Imagine a club that kidnaps people and forces them to join, but once they join they are fiercely loyal as long as they're members, though they don't stay members long. When they leave, the club finds people as much like them as possible and brings them in. The club is what it is in virtue of the internal relations between its members. But imagine them as unconscious automata that don't intend things, though together they act like they have a purpose. And instead of recruiting new members, they keep repairing the old and occasionally constructing a new one from captured automata. Our description of their activity is much like how we might be

described by a brilliant observer who didn't know about organic life.

A life is reasonably well-individuated, because it is self-directing. It is self-maintaining. The activities of the *x*s cannot at one time constitute two lives. Only when one life is subordinate to another can two lives overlap on membership.

So, call a composite object 'an organism'. What are organisms like? They're like we normally think they are. They have parts, and their properties are to some degree determined by the properties of their parts. Uniqueness is true. So, *x* is an organism iff it is composed of things whose activity constitutes a life.

So: the *x*s compose *y* iff y is an organism and the activity of the *x*s constitutes the life of y. Formally: $\Box\forall xs\forall y$(*x*s compose *y* iff *y* is an organism and the activity of the *x*s constitutes the life of *y*).

But this is not a good answer to the GCQ, since the word 'of' means something like 'possesses' or 'has', which must be defined mereologically.

Consider a carbon atom in a lump of sugar which Alice puts in her tea. She drinks her tea, the atom goes into her stomach, then to her bicep, then to her lungs, then is breathed out. It was briefly a part of her. She assimilated the atom. When? We'll get there in chapter 12. Something can also become part of an organism by being generated by the organism. An organism can cease to exist by being corrupted (its parts still exist but don't constitute a life) or being annihilated (its parts cease to exist).

3.11 van Inwagen — *Material Beings* Chapter 10: The Proposed Answer Does Not Contradict Ordinary Beliefs

A simple is a degenerate organism. Organisms are things whose intrinsic nature determines how it changes its parts over time; simples are like this. Does *Organicism* require that there be simples? Well, you might endorse think the proper parts of organisms are maximally continuous in which organisms are simple, or you might think organisms are gunky. Gunk is incompatible with organicism, since organisms (if they are not simple) must have parts that are organisms.

Tables are not defective objects or unreal or any such; there just aren't any. So why do people find organicism absurd? Presumably because there are obviously tables — a sort of Moorean move that the premises of arguments for organicism are less certain than that there are tables. But I don't deny that most English speakers, when talking about tables, speak truly! By that I mean that they express true propositions which are consistent with the proposition that I express when I say 'there are no tables'.

Compare 'the sun moved behind the elms'. It communicates something true — that two material bodies moved with respect to each other and to me. Similarly, there is something right about 'there are two chairs in the next room'. It expresses the existence of something or some things (just how to put it will be discussed in the next section).

So, when people say during their lives that 'there are two chairs in the next room', they are saying something literally true. Or at least, express a falsehood that for most practical purposes may be treated as true. Organicism doesn't contradict common sense, because common sense doesn't tell us what is true in the philosophy room.

Compare a group of people that coin the term 'bliger' for black tigers they see in the distance. After a few centuries it's discovered that bligers are actually six animals that stick together sometimes for protection. Are there bligers? No, since the six animals don't compose anything. Were the people wrong when they said, 'A bliger is crossing the plane'? No, just like people who say 'The sun is rising' speak truly.

Similarly I can concede that (A) the region R in front of me is filled with wood particles, but deny that (B) there is something that fills R or that (C) the wood-

particles within R compose something. Someone who denies (A) is a madman, but I do not deny (A). Perhaps many people believe that (A) entails (B) and (C), but I deny that. And when the common man says 'there are two chairs in the next room', what he says is consistent with the denial of (B) and (C), because it is sufficiently empty of metaphysical commitment.

If you were to tell the common man that I deny the existence of tables, he would think me mad, since he would think I regard table-utterances like ghost-utterances. But in the latter case I think that reports of ghosts are not reports of real things, whereas reports of chairs are reports of real things — simples.

3.12 van Inwagen — *Material Beings* Chapter 11: The Topic of the Previous Section Continued: Paraphrase

If all ordinary facts about ordinary objects are actually facts about the arrangement of simples, then we should be able to paraphrase ordinary language sentences into ones that don't make reference to anything but simples. The hard ones are those involving multiple quantification, identity through mereological change, or accident and essence.

Multiply Quantified Sentences. Start with Quine's criterion of ontological commitment (see §1.6.5). We need to paraphrase 'some chairs are heavier than some tables'. We'll need three variably polyadic predicates: 'are arranged chairwise', 'are arranged tablewise', and 'are heavier than'. The *x*s are arranged chairwise (tablewise) if they fill a chair (table) receptacle.

So: There are *x*s arranged chairwise and *y*s arranged tablewise and the *x*s are heavier than the *y*s. (You could use sets or regions of space instead of plural quantifiers.) We need to refers to some things in lieu of tables, and we need to mimic the quantificational structure of the original sentences. The big difference is that instead of singular predicates, we have variably polyadic ones. We use it because we want to acknowledge that there is something right about table-talk.

Paraphrases are not supposed to capture the meanings of their originals. That is, the proposition that my sister expresses with the utterance 'there are two tables in the next room' does *not* mean the same thing as 'there are some simples arranged tablewise and some other simples arranged tablewise in the next room'. It's like 'the sun moved behind the elms' and 'owing to a change in the relative positions of the earth and sun…'

The paraphrase describes the same fact as the original, does not appear to imply that there are any objects that occupy chair-receptacles, and is neutral with respect to metaphysical theories. And the original is also metaphysically neutral. It is in virtue of these properties that we call it a paraphrase.

3.13 van Inwagen — *Material Beings* Chapter 12: Unity and Thinking

One cannot prove a metaphysical thesis. The best reasons for the proposed answer are the ways it allows one to respond to philosophical puzzles about endurance. But there are some positive arguments for the view, too.

Against Nihilism: 1) I exist, and 2) If I exist, I have parts, therefore 3) I have parts. Defending (1): To ask 'why should I think that I exist?' I presume that I exist. Also, if I am thinking, I exist. I find the idea that there is just a succession of ideas utterly unintelligible.

But suppose that the same thing is going on with us that is going on with tables; the simples-arranged-mewise could ask whether I exist and the answer be 'no'. Reply: We ordinarily think that objects do things; now we realize that simples-arranged-objectwise do things cooperatively. But thinking is not a cooperative activity.

Why makes it possible for a thing to have parts? Well, I exist and I have parts, but this doesn't seem like an explanation, much like an empty vault means that it's possible that someone broke into the bank, but the empty vault doesn't seem like a good answer to 'how is that possible?'. Perhaps reason it is that the simples compose would be there in the absence of my thinking. Perhaps there are non-thinking composite objects. And if thinking doesn't ground my unity, what does? A plausible answer: my life.

So why stop with organisms? 1) Cartesian arguments show that we have to grant the existence of at least some organisms, but all activities by shelves and tables can be understood as disguised cooperative activities of simples. 2) The answers to the SCQ that allow for them (Contact, Fastening, Cohesion, Fusion, and Universalism) are unappealing. 3) The comfortable furniture of earth can be embarrassing, and doing away with it spares us the embarrassment.

3.14 van Inwagen — Composition as Identity

x is a *part of* y=$_{df.}$ *x* is either a proper part of *y* or identical to *y*.
x overlaps y =$_{df.}$ something is a part of *x* and *y*.
y is a *fusion of* the *x*s=$_{df.}$ anything that overlaps *y* overlaps one or more of the *x*s. This is composition.

Mereology is the study of parts and wholes, and has two axioms: (i) parthood is transitive, and (ii) the uniqueness of fusion. Lewis has said mereology is ontologically innocent. One might object by saying that, as a nihilist, accepting mereology would reintroduce problems from which we sought refuge in nihilism; or by saying that statues and lumps are identical. Lewis argues that composition is like identity; so by accepting mereology, you're just accepting what you already accepted!

Reply 1: for the person who thinks the statue and lump are not identical, mereology (uniqueness) forces them to pick one. But these people are like those who say that the statue and lump are identical but have different properties.

3.14.1 Lewis.

Lewis addresses his speech to the nihilist, trying to show that by accepting simples, you *thereby* accept fusions of them. But Peter says that any way Lewis says this is unclear. 'A fusion is nothing over and above its parts'; but what does *over and above* mean? Perhaps he could show us something that (according to some other theory) is over and above its parts.

'The fusion of the *x*s just is the *x*s', and 'the *x*s just are the fusion of the *x*s'; but it doesn't make syntactic sense to flank a term denoting identity with a plural on one side and a singular on the other. We can't give 'is one of' definitions like with singular or plural identity.

'The 'are' of composition is, so to speak, the plural form of the 'is' of identity'; but the plural form of the 'is' of identity is the 'are' of identity.

'The whole is the many parts counted as one thing'; but how can many things be counted as one thing?

'Commit yourself to them together or one at a time; it's the same commitment'; but this doesn't tell us how they're identical. I can commit to the Continental Rationalists one at a time, or to Descartes and then Leibniz and then…This doesn't show that there is a thing composed of Descartes and Leibniz and …

'If you inventory reality, it's double-counting to list the fusion of the *x*s and the *x*s'; but suppose I have a parcel of land, and it has all and only as parts 6 pieces of land. When I want to do some quantification over things I have, how many are there in the domain? 7, right? But if it's double-counting to count the parcels and the land, why isn't my domain either 6 or 1?

3.14.2 Armstrong

Thesis: '*x* overlaps *y*' means '*x* is partly identical with *y*'. This makes some sense, since what happens to a certain part of y matters to *x*. But shouldn't we just say that both parthood and identity have something to do with overlap? Both partial identity and identity can be defined in terms of parthood, but neither partial identity nor parthood can be defined in terms of identity.

And what follows about the ontological innocence of mereology? I believe in the *x*s, and you tell me there is a *y* such that something is partly identical with *y* if and only if it's partly identical to one of the *x*s; how is this innocent? You have added a new thing, *y*. You tell me I already believed in *y*, and I deny that. You said that by believing in the *x*s, I believed in *y*. But then we're back where we started.

3.14.3 Lewis Weakened

Finally Lewis says that, although you don't add to the furniture of the world, what is true of the one isn't true of the many because it is one and they are many. This is precisely Peter's problem! But: mereology is so much like identity that we should talk of ordinary identity as the limiting case of broad identity (which includes many-one and constitution and overlap).

Support:

1) It is redundant to say *x* and *y* exist when they are identical; it is redundant to say the *x*s and *y* exist when *y* is a fusion of the *x*s.

2) Given that *x* exists, there is something identical with *x*; given the *x*s exist, there is a fusion them.

3) There can't be two things identical to *x*, and there can't be two fusions of the *x*s.

4) To fully describe *x* is to fully describe anything identical with it; to fully describe the *x*s is to fully describe their fusion.

5) *x* must occupy the same spacetime region as anything identical to it; the *x*s must occupy the same spacetime region as their fusion.

Peter only accepts (3) and (5). So, the analogy is too weak. Unless, that is, Mereology is true. Then Composition is Identity, and Mereology is ontologically innocent. So we must find out if Mereology is true. But those who don't already believe it won't think it's innocent, and they won't see its ontological innocence as an advantage. Those who reject Mereology will regard the strong analogy between composition and identity that is a consequence of Mereology as a defect in Mereology, since (they will say) composition lacks many of the features that a statement of the analogy attributes to it.

4 Properties and Truthmakers

4.1 Armstrong — *Truth and Truthmakers* Chapter 1: An Introduction to Truthmakers

4.1.1 Introduction to Truthmakers

Against physical objects as sense-data. Proponents argued that they existed counterfactually: had I been looking such-and-such, I would have seen a chair. But CB Martin asked, 'what are the truthmakers for those counterfactuals?' Realists have no problem answering the question; phenomenalists had to take them as brute or try to ground them in actual sense-data. But what about worlds with no minds?

4.2 Armstrong — *Truth and Truthmakers* Chapter 2: The General Theory of Truthmaking

There is a distinction between a general theory of truthmaking and particular answers to truthmaking questions. The idea is that there is some portion of reality and a truth-bearer that stand in a certain cross-categorial relation, that of *makes true*. This is not a causal relation; the best way to put it is that the truth-bearer is true *in virtue of* the truthmaker. The relation is necessitation (Truthmaker Necessitarianism (TN)), and every truth has a truthmaker (Truthmaker Maximalism (TM)).

Truthmaker Necessitarianism. It's not entailment, since that holds between truth-bearers. Perhaps it holds between the existence of the thing and the proposition that the thing exists; but there are no states of affairs like this, since it would turn existence into a property.

Argument for necessitarianism: suppose a truthmaker T for *p* fails to necessitate *p*. Then possibly, T exists and *p* is false. So there is something else that must be satisfied in order for *p* to be true — either a further thing U or proposition *q*. If U, then T+U is the truthmaker for *p*, and necessitates *p*. (If U+T doesn't necessitate *p*, then we can ask what else must be satisfied…) If *q*, either *q* has a truthmaker V (in which case V+T necessitates *p*), or not (in which case there are truths without truthmakers). So, truthmaker necessitarianism.

This does not entail maximalism. Indeed, there is no argument for maximalism, other than an intuition that truths all depend on entities outside themselves for their truth.

Supervenience. Bigelow (1998, ch19) thinks the intuition behind truthmaker is that 'truth supervenes on being' (TSB). By fixing the world, one fixes the truths. No change in truth without a change in being. But being also supervenes on truth (for contingent truths); change the truth, change the being. Objection: this rules out truthmakers for necessary truths. Objection: shifts our focus off of finding truthmakers.

Expressibility. The converse of TSB is Expressibility: for all being, there is a proposition that truly renders the existence and nature of this being.

Truthmaking an internal relation. If TN, then truthmaking is an internal relation. So, given just the relata, we are given the ontology.

Falsemakers. No great use for falsemakers. Every truthmaker for p is a falsemaker for $\neg p$. Since every false proposition has a negation and that negation has a truthmaker, we can do with just truthmakers. Except, perhaps, for impossible truths. If '$\Box(p \vee \neg p)$ and $\neg \Diamond (p \wedge \neg p)$', then any truthmaker for the true conjunct is a falsemaker for the false one.

Entailment. If T is a truthmaker for p, and p entails q, then T is a truthmaker for q. This doesn't hold when q is necessary, so we should either restrict the relation or the principle. Probably the principle, and say that it holds for purely contingent truths.

Truths and falsehoods are propositions. Many things are truth-bearers, but they are so on account of their relationships to propositions, which are the fundamental truth-bearers. What are propositions? Not equivalence classes of synonymous sentences, since they could have meant different things and remained synonymous; synonymy depends on meaning, not vice versa.

Propositions are the intentional objects of beliefs and thoughts and statements. They are abstractions, the content of belief, the meaning, what makes the statement the particular statement it is. But what about propositions never thought of? They're true without concrete truth-bearers. They're needed, because truthmakers necessitate the truths, and truthmakers can exist in worlds without minds. So propositions are possible intentional objects.

Connecting truth with reality. Correspondence theory of truth. But not one-one correspondence between truthmaker and truth — rather, it's many-many.

Realist definition of truth? *p* is true iff ∃T such that T necessitates that *p* and *p* is true in virtue of T. The biconditional upholds both TN and TM. This is no analysis, since the right-hand side contains 'true'.

Truthmakers for *p* may properly include truthmakers for *p*. Sometimes there is a T such that T is a truthmaker for *p* and T" and T' such that T contains T' and T" contains T. So the world is the least discerning truthmaker. Containment can be mereological, but we may need more for facts or states of affairs. The Containment Thesis: for each T, *p* and *q* where T is a truthmaker for *p* and *p* entails* *q*, T has a part that is a truthmaker for *q*.

4.2.1 Minimal truthmakers.

If T is a minimal truthmaker for *p*, then you cannot subtract anything from T and the remainder still be a truthmaker for *p*. A truth may have many minimal truthmakers; for example, 'there is a human being', or 'there are simple properties'. Not all truths have at least one minimal truthmaker; for example, 'there are infinite electrons', as long as there is a denumerable infinity of electrons, can be made true by any *n*th electron in the sequence of electrons. Of course, if there's just a fact that *there are infinite electrons*, then that's the minimal truthmaker. Some truths have a unique minimal truthmaker. Consider 'a is F'. The unique minimal truthmaker is *a's being F*.

Ontological commitment. Positing truthmakers is adding them to your ontology. But why not add to your ontology by quantifying like Quine suggests? Truthmaking also focuses on predicates. Quine thinks predicates are ideology, but that stacks the deck in favor of nominalism. If we need properties and relations to do truthmaking, then we ought to add them to our ontology. And if there are true propositions quantifying over facts, then we already need facts in our ontology.

Different truths with the same minimal truthmakers? Truths all have the same maximal truthmaker — the world. And some have the same minimal truthmaker.

For example, '*x* is F' and '*x* is F or 2+2=5'. And 'this carpet is red' and 'this carpet is scarlet'.

4.3 Armstrong — *Truth and Truthmakers* Chapter 4: Properties, Relations and States of Affairs

4.3.1 Properties

Sometimes predications are not ontologically important — '*a* is identical with *a*'. But what about '*a* weighs 4 kilos'; what is the truthmaker? A natural answer is '*a*'! This is plausible if weighing 4 kilos involves no further particular — if mass is not a relation. So the particular is a truthmaker. But extreme nominalists think the *a* is 4 kilos because it is a member of a class; then it seems the class is the truthmaker, but it's so big! And if it's because of a predicate, that seems weird; *a* would be 4 kilos even if the predicate didn't exist.

The Euthyphro dilemma helps: are objects F in virtue of being in a class, or are they in the class in virtue of being F? The latter is much more attractive. Same goes with the predicate nominalist version. Resemblance nominalism fares better, since resemblance is an internal relation.

But in some sense the thing seems too big to be the truthmaker. After all, it has tons of properties; is *the whole thing* needed to make true every true predication? Better to say that the object has properties that are objectively there, and they make true the respective predications.

So, truthmaking seems to favor realism about properties. But it is neutral on whether they are universals (though they must be immanent universals) or particulars, and dispositionalist (they are causal powers) or categoricalist (independent of causal powers).

Trope theories. Truthmaking seems to tell against trope theories. Consider two simple, exactly resembling tropes *a* and *b*. It is a necessary truth that <*a* is distinct from *b*>, and it is also true that <*a* is exactly similar to *b*>. These have the very same truthmakers — *a* and *b*. But since they are simple, this seems odd. Better to think of tropes as facts — they are particulars having properties. Truthmaking is also neutral on whether to think of particulars as bundles or substances.

Is predication necessary or contingent? If a stone has mass M, then the mass

trope of the stone is mass M. But any other mass trope wouldn't be the mass trope of that stone. And certainly it couldn't be the same trope without having mass M. And trope bundle theorists must think that the relation between a bundle and every trope in it is a necessary one, or else it would be a different bundle.

Instantiation is necessary, since it is a partial identity. Properties (the sparse properties) are, for Aristotelian realism about universals, ones that run through a plurality of particulars. Different particulars can have the very same property. But we also need the conception of particulars as ones that run through a plurality of universals. Different properties can all attach to the very same particular. This gives us a substitute for contingency, invoking counterpart theory.

States of affairs. We've got to get particulars and properties together, or get bundles tied up. Assuming the links are contingent, the entities can't do the job. Truthmakers must necessitate, and the entities don't. So the states of affairs are needed to do the necessitating. So the one who thinks predication isn't necessary needs to add to her ontology.

Armstrong's view: *a*'s being *F* is necessary because *a* and universal *F* intersect, and are thus partially identical. Given *a* and given F, as opposed to mere counterparts of this particular and this universal, then the state of affairs of *a*'s being F is automatically there. This makes states of affairs contingent.

Relations. The truthmaker for *a* and *b* stand in R is the mereological sum of *a* and *b*, at least for some relations (like difference). But it seems that <Venus is larger than Mars> doesn't need Venus and Mars and all their properties — just the states of affairs of Venus being a certain size and Mars being a certain size. So Venus and Mars are truthmakers, but the minimal truthmaker is the mereological sum of the states of affairs. This is wrong; since larger is an internal relation, it is there whenever the particulars are, and thus we don't need states of affairs. Since truthmaking is an internal relation, it only demands as relata a proposition and a truthmaker. For external relations, we need to posit them out in the world, and as constituents of states of affairs. So we need states of affairs as truthmakers for propositions that external relations hold.

4.4 Lewis — New Work for a Theory of Universals

Purpose. Armstrong thinks universals are the only answer to the One over Many. Lewis disagrees. But there is other work that universals can do which might motivate our accepting them. Here is some of that work.

4.4.1 The Property Role

Universals are things like Armstrong says they are. Properties are classes. Two differences. 1) Instantiation. Universals are wholly present in their instances, while properties are partly present in their instances. 2) Universals are sparse (there only exist those which are necessary for completely characterizing a world), while properties are abundant.

Strategy 1. Make a subclass of properties to play that role; call a property *perfectly natural* if its members share some one universal. Call a property *natural* if it suffices to ground resemblance relations.

Strategy 2 (Nominalist). It is a primitive fact which properties are perfectly natural, which are natural, and which are not. 'Natural' is a primitive predicate.

Strategy 3 (Nominalist). Take the resemblance relation (variably polyadic and contrastive) between objects as primitive. Then define the natural properties in terms of the resemblence/nonresemblence of their members and nonmembers.

Another aspect of the property role: serving as the semantic values for predicates. Any nominalist paraphrase strategy will be ad hoc. But even the universal theorist must paraphrase, unless she really believes that there is a universal "colorness." She must also paraphrase second-order quantification. In both cases, properties play this role better than universals.

Another aspect of the property role: serving as the content of intentional attitudes. I desire/believe/etc some properties which aren't universals.

4.4.2 One Over Many

Armstrong: We need to account for some Moorean facts about sameness. We need universals to do that.

Lewis: One can give an account of p by (i) denying p, (ii) analyzing p, or (iii) taking p as primitive. An adequate nominalism ought to take Moorean facts about sameness as primitive. Further, Armstrong has changed the question from one about sameness to one about predication generally. I agree we need an account of sameness (but we can take it as primitive); I do not agree we need an account of predication.

4.4.3 Duplication, supervenience, and divergent worlds

Duplication. To analyze duplication, we need to distinguish between intrinsic properties and extrinsic properties. But intrinsic properties are the ones that don't differ between duplicates. Circularity. So let's analyze duplication in terms of natural properties.

If we want to make the distinction the way Lewis does, then all perfectly natural properties are universals. That's good. But there are no extrinsic universals. And Armstrong allows them. He shouldn't.

Supervenience. Supervenience theses need an account of qualitative duplication of worlds. And to do that, we need a notion of natural properties.

Divergence. Divergent worlds are those which are duplicates up to a time. The notion is of use in formulating determinism. First, a system of laws of nature is Deterministic iff no two divergent worlds both conform perfectly to the laws of that system. Second, a world is Deterministic iff its laws comprise a Deterministic system. Third, Determinism is the thesis that our world is Deterministic.

4.4.4 A minimal form of materialism

Materialism is the thesis that physics is, in principle, able to tell us everything about the world. We might formulate it as a supervenience thesis: no difference between

worlds that don't differ physically. But that's to make materialism metaphysically necessary, and it ought not be. After some Chisholming, materialism: among worlds where no natural properties alien to our world are instantiated, no two differ without differing physically; any two such worlds that are exactly alike physically are duplicates. Physics discovers the natural properties.

4.4.5 Laws and causation

Laws. Lewis agrees with Armstrong that we need universals or natural properties to explain lawhood, but disagrees about why. Armstrong: two universals F and G are related by a second-order universal N (a lawhood-making relation), such that if N(F,G), then $\Box\forall x(Fx \supset Gx)$. Lewis: one can do this with natural properties, but one loses the locality of laws. However, Lewis rejects Armstrong's analysis since he can't understand N unless N *just is* constant conjunction, in which case this is no analysis at all.

Lewis prefers a regularity analysis. The candidate regularity axioms must only rely on perfectly natural properties as primitives. So laws only refer to natural properties, and fundamental laws only refer to perfectly natural properties.

Causation. Since laws require natural properties, so does causation. Three reasons: 1) Causation involves laws. 2) Non-backtracking counterfactuals must rely on divergence, which relies on natural properties. 3) Causation holds between events. To prevent overdetermination, we need events to have more and less natural properties.

4.4.6 The content of language and thought

Putnam's argument: reference is radically indeterminate, and there can be no constraints on it, since they would be expressed in language, which is radically indeterminate. Lewis' Reply: if it's a causal constraint, then we need natural properties, since we need them to understand causation. But it's not. It's in the referent, and it consists in the referent's eligibility, which in turn is based in natural properties and a degreed notion of naturalness.

4.5 Lewis — Truthmaking and Difference-Making

Deflationary conception of truth: The proposition that donkeys talk is true iff donkeys talk, and the proposition that snow is white is true iff snow is white…This won't work for all that-clauses, nor can we grasp all propositions, but we get the idea well enough. Supposedly punctures the interesting claims in the other theories of truth, but Lewis disagrees. Suppose a grand theory tells us propositions are true just in the case that they satisfy condition X. Then combine the deflationary and grand theories, and you get: snow is white iff the proposition that snow is white satisfies X…So the grand theory isn't a theory of truth, but a theory of many things (talking donkeys and snow and the like).

The most promising of the grand theories requires truth to depend on the way the world is. But these are theories about many things. Consider the truthmaker principle: for any true proposition p, ∃ *x* such that *x*'s existence necessitates *p*. Four comments. 1) Only applies trivially to necessary truths. 2) The principle applies counterfactually. 3) Applies derivatively to true sentences and thoughts. 4) '*x* necessitates *p*' means that in every world where *x* exists, *p* is true; but on Lewis' picture, things exists in only one world, so he'll give a counterpart-theoretic definition. But this paper is neutral on questions of possible worlds, except for assuming possible worlds talk is legitimate.

4.5.1 Precise Truthmaker Principle

(TM) For any proposition *p* and any world W, if *p* is true in W, there exists something T in W such for any world V, if T exists in V, then *p* is true in V.

This implies: For any worlds W and V and proposition *p*, if *p* is true in W but not in V, then something T exists in W but not in V.

But, says Lewis, for any two worlds there is a proposition true in one and not in the other: the proposition that the first is actual. So TM boils down to DM:

(DM) For any two worlds W and V, something T exists in W but not in V.

And we're no longer talking about truth! We've just said that all worlds differ with respect to what there is. This rules out indiscernible worlds. Also, (DM) implies distinctive occupation:

(DO) For any world W, something exists in W and in no other world.

(DM) does not imply (TM), but it does imply (TMP): For any proposition *p* and world W, if *p* is true in W, there exist one or more things T_1,T_2…in W such that for any world V, if all the Ts exist in V, then *p* is true in V.

We could rest with (TMP), or group the Ts together into a single truthmaker via mereological fusion (which will only work given mereological essentialism), class (which will work as long as 'exist in V' doesn't mean 'are a part of V' and as long as none of the Ts can't be part of a class, say by being a proper class). Better: split each of the Ts into its largest part that's a class and largest part that's an individual, take the union of all the class-parts and the class of all the individual parts.

(TM) is equivalent to (DO). (TMP) is equivalent to (DOP): For any world W, some things T_1,T_2…exist in W and do not all exist in any other world.

(DM) also implies (MI): For any *p* and W, if *p* is true in W, there are one or more things T_1,T_2…not in W such that for any V, if none of the Ts exist in V then *p* is true in V.

(DM) is a principle of two-way difference-making. That is, when going between any two worlds, you have to add something to the ontology. You can subtract, too, of course, but you must add. Lewis thinks this is a problem — why not take something away and not replace it? This would get us (DM-): For any W and V, either something exists in W and not V, or vice versa. This allows for, but doesn't require, two-way difference-making. This implies a weakened version of (TM), (TM-): For any *p*,W,V, if *p* is true in W but not V, then either something exists in V and not W or vice versa. (TM-) is equivalent to (DM-).

(TM-) allows truths to have truthmakers, or be true because they lack falsemakers. Negative existentials are true in worlds in which there are no unicorns because those worlds lack falsemakers — unicorns. If we don't like (TM-), we need truthmakers for negative existentials to replace the missing unicorns. They would have to meet two conditions: (i) not possibly co-exist with unicorns (lest they make true that there are no unicorns in worlds in which there are unicorns), and (ii) exist in every world in which there are no unicorns.

Whatever these things turn out to be, they are bad news. First, because they are complex, involving a unicorn and something else. Second, they must be involved in

necessary connections between distinct existences. But the second can explain the first.

To uphold (TM), we need unicorn-replacements, and replacements for every other contingent thing. But then we have a (too) swift reason why there must be something rather than nothing: the proposition that there is nothing would be true without a truthmaker!

4.5.2 One Further Step

The retreat to one-sided difference making was a step in the right direction. One more step: worlds can differ without differing in their ontology, but just one thing having a different property. The strongest plausible principles are (DM=): For any two worlds, either something exists in one and not the other, or else some things stand in some fundamental relation in one and not the other. (TM=): For any *p*,W,V, if *p* is true in W and not V, then either something exists in one and not the other, or else some things stand in some fundamental relation in one and not the other.

If we don't buy (TM=) and (DM=), we need truthmakers for ascriptions of fundamental properties. They are atomic states of affairs or facts, which are somehow constructed (neither mereologically nor set-theoretically) out of things and properties — something about unexplained necessary connections between the two. Since it's so mysterious, we should take the second step. But we needn't take a third step.

4.6 Paul — Logical Parts

We can think of objects as having spatial parts, and we can think of objects as having qualitative parts. Thesis: objects are the sums of their qualitative components. This is a property mereology — a mereological bundle theory (MBT). Objects have properties as parts.

D1: *x* logically overlaps *y* iff *x* and *y* have a logical part in common.

D2: *x* is logically distinct from *y* iff *x* and *y* have no logical part in common.

D3: *x* is a logical fusion (sum) of *y*s iff *x* has all the *y*s as logical parts and no logical parts distinct from the *y*s.

Officially, the theory endorses unrestricted composition. Any non-empty collection of properties composes a fusion. But not all fusions are objects; all actual fusions are objects. Sameness of location of properties is insufficient for objecthood: (i) physics says co-location is possible, (ii) co-location of interpenetrating material objects is impossible, (iii) unlocation is impossible, and (iv) statue-clay questions are decided by fiat. So a primitive 'coinstantiate' relation is better than a primitive 'compresent' relation.

Proper logical parts of objects exhibit the usual formal properties of proper parts: irreflexivitely, asymmetry, and transitivity. But proper logical parts and proper spatial parts do not bear any relations to each other.

4.6.1 Problem Solved!

1) Sameness of Difference of Properties. Two cups have the same shade of red iff red is a part of both cups.

2) Aristotelian and Platonist realisms. Transcendence is mysterious, but so is multiple location. MBT allows us to be realists. We can explain multiple location, transcendence, and exact resemblance in terms of parthood, which we understand quite well.

3) The best of tropes and universals. Conflate the distinction. Take a cup; subtract all the logical parts but redness. There's just one thing left, and it has no location properties. So it's a trope, and a universal. It overlaps (logically) every red object. The objects that have redness fused are the red tropes, and redness is the

universal. Does away with 'exact resemblance'. Also makes sense of 'are the same object': property sharing. A type is an object that overlaps the suitably intrinsic properties of other objects excluding their spatial and temporal location.

4.6.2 Endurance and Change.

An object G endures without changing by logically overlapping different times by being part of two or more temporally distinct objects which are properly causally connected, each of which includes G plus the property of being located at a time.

A person can change her properties while remaining the same person, even if not the same fusion. We determine sameness of persons in terms of sameness of their essential properties while allowing them to have a varied range of accidental properties. A person is a highly specified kind of object, i.e., what we can call a complex object. Here, x is the same complex object as y only if x and y overlap with respect to their essential properties and x and y include a (possibly different) selection of certain accidental properties. When a person endures through change, she endures only if the kind of object she is endures.

4.6.3 Material Constitution.

Considered with all its parts, the clay is not identical with the statue, although neither is it distinct from the statue! The object that is the clay with all its logical parts partially overlaps the statue with all its logical parts: the overlap includes parts that are what we might call 'material properties', such as having mass m and color c, but excludes many other parts.

1) Constitution involves the sharing of logical parts. 2) In virtue of the sharing of parts, constitution does not imply double counting even if constitution is not identity. 3) Since the nonidentity of the objects follows from the fact that not all the proper parts of the objects are shared, we see how to deny that constitution is identity yet embrace the mereological intuitions that defenders of constitution as identity have been so concerned to defend.

If the clay and the statue had shared all of their proper parts, they would have been identical. The extensional principle, when suitably broadened so as to include

all kinds of parts, is intuitively correct.

The problem with material constitution arises when we think of objects in explicitly spatial terms while implicitly thinking of objects in broader terms — i.e., in modal terms. If we subtract modal properties, they are identical. There are two partly overlapping objects which share parts such as having mass m.

4.6.4 How Many Objects?

We have more objects than we commonsensically thought we had. Context determines how we count. Although we usually count by distinctness, we can also count by spatial, temporal or qualitative difference. In answer to the question, 'How many objects?' we must say that it depends — it depends on how we are counting.

4.7 Sider — Bare Particulars

There is a complaint that bugs Ted against the substratum theory — particulars are in some sense separate from universals. The complaint is that the nature of the particulars is mysterious if they are disconnected from universals — that is, if they have no properties.

There's agreement that (i) there are universals and particulars, (ii) particulars have universals. But the bundle theory says particulars *are* universals — well, bundles of them. Given the uniqueness of composition, on the bundle theory no two things can have the same universals, since things just are universals. But on the substratum theory, they can.

Thin and thick particulars. Thick particulars are mereological fusions of particulars with universals. Thin particulars are the mereological difference between thick particulars and their universals. Substratum theorists have instantiation (which they shouldn't think is a relation), and bundle theorists have compresence.

First Reply: the objection is wrong! Thin particulars have properties!

Objection repackaged: thin particulars have no properties *in themselves*? What does this mean?

First, no intrinsic nature. Reply: yes they do; intrinsic nature is the monadic universals they instantiate. Rejoinder: no, that's not good enough; there are two things (object and F-ness) where there should be one (an F-thing).

Second: When I'm sitting, am I sitting because I instantiate sitting, or do I instantiate sitting because I'm sitting? Ted wants to say the latter; particulars wear the metaphysical pants. Being 270 pounds doesn't mean bearing the 'mass in pounds' relation to the number 270, it just involves me and my mass. Or, perhaps, just ME. Property talk just lets us say things that are handy. They don't do any factmaking.

Third: the essence is bare because it doesn't involve properties. Reply: its essence involves what it has to instantiate. Rejoinder: only a things parts can characterize its essence. Reply: why?

Fourth: thin particulars lack nontrivial necessary properties (NNP). Reply: there are necessary truths about which properties a thin particular has. Other Reply: nobody is immune, if you're presupposing extreme combinatorialism. Maybe the

objection relies on a special modal status of parthood, like: P is a NNP of *x* iff *x* has P and P concerns what parts *x* has. But this doesn't help the bundle theorist: *b* has redness, roundness, juiciness. So, necessarily *b* has redness as a part. But redness might not be compresent with juiciness, though they both be parts. And who cares about modality anyway?

Fifth: if particulars are wholly distinct from universals, possibly there are truly bare particulars that instantiate no properties. Armstrong responds by building into his theory the impossibility of this, but is it ad hoc? Or, the substratum theorist could insist that this could happen to nominalists ('*x* is F' is false for all F) and bundle theorists (a universal is compresent with no universals, even itself). OR: accept the possibility, and insist that the reason it seems bad is based on a confusion between sparse and abundant properties.

Compare: If a BP had no properties, then it would have the property 'having no properties', which is a property. Reply: On abundantism, true; on sparsism, false; 'has no properties' isn't a property. BP theorists should be sparsists.

Sixth: everything must have an intrinsic nature, which means it must be some way, which requires that it have at least one monadic universal. But you could have a nature by failing to instantiate any monadic universals. Truly bare particulars are certain ways, in that they have no properties. No mass, spin, color, etc.

Seventh: BPs have the property 'being a particular'. Reply: 'being a particular' isn't a property, since bare particulars are their own ontological category. '*x* is a thin particular' is a primitive.

Ted thinks points of spacetime and mathematical entities are truly bare particulars. Points of spacetime have as features only their relations to each other; physics doesn't require that they have any intrinsic nature. Similarly, the natural numbers have as features only their relations to each other.

4.8 van Cleve — Three Versions of the Bundle Theory

Bundle theory = a thing is nothing but a bundle of properties. (i) a thing is a complex entity of which properties are the sole constituents, and (ii) for a thing to have or exemplify a property is for that property to be a constituent of it.

4.8.1 6 Objections to Bundle Theory

1) If a thing were nothing more than a set of properties, any set of properties would fulfill the conditions of thinghood, and there would be a thing for every set. But in fact there are many sets without corresponding things - e.g., the set (being an alligator, being purple).

2) If a thing were a set of properties, it would be an eternal, indeed, a necessary, being. For properties exist necessarily, and a set exists necessarily if all its members do.

3) Exemplification cannot be analyzed simply as the converse of membership. Redness is a member of (redness, roundness), but it would be absurd — a category mistake — to say that that set is red.

4) If a thing were a set of properties, it would be incapable of change. For a thing could change its properties only if the set identical with it could change its members, but that is impossible; no set can change its members.

5) If a thing were a set of properties, all of its properties would be essential to it: not only could it not change its properties, but it could not have had different properties to start with. This is because it is essential to a set that it contains the very members it does.

6) If a thing were a set of properties, it would be impossible for two things to have all the same properties, since it is impossible for two sets to have all the same members. Thus, the bundle theory requires the Principle of the Identity of

Indiscernibles (PII for short) to be a necessary truth. But PII is not a necessary truth; exceptions to it are conceivable.

Objection 6 can be answered by countenancing impure properties (since they're unsharable). But the bundle theorist can't countenance impure properties, at least not for this reason; they are derivative from individuals. And if the bundle theory is true, individuals are derivative from properties. Vicious circle!

Objections 4 and 5 are true even if you take objects to be mereological sums instead of sets.

4.8.2 Details

Some bundle theorists don't say an object is nothing but properties; rather, it's properties that are co-instantiated. Co-instantiation relates a number of properties iff they're properties of the same individual. But the same derivativativeness objection arises. So the biconditional must be abandoned. Co-instantiation is contingent.

Co-instantiation gives the bundle theorist an answer to (1)-(3). Re (1): there is not a thing for every set of properties, only for co-instantiated properties. Re (2): things exist only as long as the properties are co-instantiated. Re (3): it's not enough to have redness as a constituent; it must be co-instantiated.

But co-instantiation doesn't help with (4)-(6). Re (4): changing co-instantiation is replacement, not change. Re (5): things are contingent, but have the properties they do necessarily. One might respond by distinguishing a core and fringe; individuals are cores, and have essentially the core and accidentally the fringe. Reply: cores are very small, and there's risk of identifying distinct objects. Remember, we can't use impure properties in the core. Rejoinder: use world-indexed properties. Reply: but the bundle theorists builds worlds from properties, so to use them in properties is circular. Reply: that's how we pick them out, but that's not what they are. Rejoinder: then what are they?! Re (6): individuals are complexes whose only constituents are properties, and it can scarcely be denied that complexes differ only if their constituents do. Reply: bundles of tropes. Rejoinder: tropes are particulars, not properties.

4.8.3 A New Bundle Theory

Thesis: Decline to identify individuals with complexes of properties, offering instead to translate any statement ostensibly about individuals into a statement exclusively about properties. For example, it might translate 'There is a red, round thing here' as 'Redness and roundness are here co-instantiated'. But it would not identify the red, round thing with the complex of properties co-instantiated at the place in question; indeed, it would not identify the red, round thing with anything. 'Red, round thing' would be a non-referring phrase, susceptible only of contextual definition.

So, there are no individuals. The statement 'there are individuals' is true, but nothing is an individual. Properties (universals) are the only subjects. The logic just requires property names and a sign for instantiation. The new bundle theory gets around (6) by allowing that the same maximal intersection of pure properties can be instantiated twice, and this seems to be a reasonable sense in which there could be a world containing two indiscernibles. But Max Black worlds are identical.

Cost: anyone who wants to believe that there is such a thing as himself must reject the new bundle theory; and anyone who wants to allow for change, accidental predication, and indiscernibility must reject the old one. What is the alternative? In a word, it is substance: an individual is something over and above its properties, something that has properties without being constituted by them.

4.9 van Inwagen — A Theory of Properties

Assumption: it's better not to have to believe in abstract objects. (Take 'abstract' and 'concrete' as defined ostensively.) It's puzzling that objects should fall in two such exhaustive and radically different categories; it would be better to suppose one is empty. And since we are concrete and we understand the intrinsic features of concrete things, let's hope the abstract category is empty.

4.9.1 We Must Believe in Abstracta

Humans have something in common. So, there is something humans have in common. And what goes for humans goes for everything. To figure out if we must believe in x, we should see if the things we believe already commit us to x. Take (S) 'spiders share some anatomical features with insects.' What is an anatomical feature if not a property? And does this imply 'there are some anatomical features spiders share with insects'? What might the nominalist do?

1) Become a platonist.

2)Disbelieve that spiders and insects have some features in common.

3) Show that it doesn't follow that there are anatomical features.

4) Affirm nominalism and the sentence, say there is some error that she can't point out.

(2) is unattractive, for biological reasons and because there are many sentences like it that one would have to give up. (4) is a last resort. So, the nominalist will probably have a go at (3). This will involve a paraphrase of (S). It's possible to find such a paraphrase quantifying over other abstracta. Quine thinks we can just use sets. Sets are abstract, but they are more well-behaved.

There is no non-abstract way. Any paraphrase, like 'spiders and insects are alike in some relevant ways', is going to quantify over ways or respects or some such. If the nominalist insists this isn't to be taken seriously, she must provide another paraphrase. If she doesn't mean it to be taken at all quantificationally, then how does she account for the entailment 'two female spiders are alike in all anatomically relevant ways, therefore, an insect like one spider in some anatomically relevant way is like another spider in some relevant way'. Paraphrases must leave us with an

account of logical relations between predicates.

We can get away from properties only by quantifying over some other abstracta. But it's better to quantify over properties. What else would 'ways' or 'respects' be if not properties? And talk of ways things could be is indispensable.

This is not to say that science needs properties. Nor is it to say that science's needing properties is evidence for their existence. Nor is it to say that the indispensability of property-talk in our normal discourse is evidence for properties.

This argument fails if there's substitutional quantification or second-order quantification. That is, if there is, we might be able to get away without properties. But both of these are meaningless. Substitutional quantification is meaningless unless it is shorthand for objectual quantification over linguistic objects. Second-order quantification is meaningless unless the non-nominal quantifiers are understood substitutionally, (in which case see the former), or it's shorthand for nominal quantification over properties.

4.9.2 If we need properties, we should have a theory

We know what the property role is and that something must play it, but it would be nice to know the intrinsic properties of the things that play it. Unfortunately, we can't say anything like Argle can say about holes.

4.9.3 Lewis' Theory

Properties are sets. The property 'being a pig' is the set of all possible pigs. A possible x is an x that is possibly F, where F depends on what x is, eg a possible proposition is a proposition that's possibly true, a possible state of affairs is a state of affairs that possibly obtains, and so on. But what is a possible pig? A thing that's possibly a pig? Then if I'm possibly a pig, I'm in the set of all possible pigs. And what about possible objects? Meinongians can answer these objects, but we shouldn't be Meinongians, because they don't say what they mean by 'exist'.

Lewis says the possible pigs are not spatiotemporally related to me. But why suppose there are any, and why think it has anything to do with modality? And

why think that there are enough possible pigs for the set of them to be the property 'being a pig'?

4.9.4 Peter's Theory

Lewis' theory is false, and a true theory would be better. Peter's theory is true, but nearly vacuous. Thankfully it is inconsistent with some theories, so it's not totally uninteresting.

The property role is filled by things that can be said of something. Some things can be said, period — propositions. Some things can be said of a thing — monadic properties. Some things can be said of two or more things — relations. Let's call them 'assertibles'. Propositions are unsaturated assertibles. Of course, if there are infinite conjunctions, then there are some propositions that no finite being can say.

There are Russellian objections to admitting assertibles into our ontology. If there are things that can be said, there are things that can be said of things that can be said. 'that it is isn't white' can be said of 'that it is white', since 'that it is white' isn't even visible. So we can say of 'that it is white' that it can't be said truly of itself. So, we ca say of things that they can't be said truly of themselves. So, 'it can't be said truly of itself' is an assertible. Can it be said truly of itself? So, if we admit assertibles we must admit this one, but admitting it leads to paradox, so there aren't assertibles. Peter denies this — there's no such assertible — and invokes any of the standard ways of dealing with the paradox.

If you don't like thinking of assertibles as properties but are persuaded by the rest of the paper, then you should think there aren't properties, but assertibles can do some of the work properties were supposed to do.

Here are things that don't make sense, if properties are assertibles: 1) they are constituents of concrete objects, 2) they are ontologically more basic, 3) they are objects of sensation, 4) existence is not a property, 5) there are no hacceities, 6) there are no disjunctive properties, 7) there are no uninstantiated properties, 8) properties are contingent.

5 Modality

5.1 Lewis — *On The Plurality of Worlds* Chapter 1.1-1.3, 1.6-1.9: A Philosopher's Paradise

5.1.1 Modal Realism at Work

The Thesis. The world is very inclusive; everything in any direction in space or time from here is included. But things might have been different. For every way things might have been different, there is a world — they are at no spatial or temporal distance from me, all isolated from each other other causally and mereologically. And every way a part of a world could be is a way some part of some world is. They exist just like us. Why believe in it? It's serviceable, a paradise for philosophers. Gives unity and economy of theory. Great ideological simplicity, paid for with a massive ontology. These are not conclusive reasons.

5.1.2 Modality.

Possibly there are Fs iff for some world W, there are Fs at W. 'At W' serves to restrict the scope of the quantifier. Of course, 'at W' needn't always restrict all quantifiers in its scope. ('In Australia, there is a yacht faster than any other.') And there are often other restrictions. Our names attach to this-worldly things and their other-worldly counterparts. Necessarily there are Fs iff for every world W, there are Fs at W. Modality is often restricted by accessibility relations (nomological, historical, etc). Modality *de re* is quantification over possible individuals, restricted by counterpart relations. $\Diamond x$ is F is true iff there is a world W such that x is F at W or x has a counterpart y at W and at W y is F. But there are problems with 'x exists'.

Desiderata: 1) Modal operators are quantifiers over worlds, 2) Humphrey satisfies formulae at other worlds, 3) He is necessarily human, 4) He possibly does not exist, 5) It's not the case that he satisfies 'possibly is human and does not exist'. But if he satisfies 'is human' at all worlds and 'does not exist' at some, then he satisfies both in some; that's bad! Equivocation? Give up quantification over worlds for 'is essentially human'? In any case, we're in trouble.

We also have a problem with supervenience if we're just using boxes and diamonds. Examples: dot-matrices, laws/local qualitative properties, and mind/body. F supervenes on G: there is no world where two things are different with respect to F and not different with respect to G. This does well enough for the dot-matrix and narrow psychophysical supervenience. But not broad psychophysical supervenience or the supervenience of laws on local qualitative character (since in no worlds do two worlds differ). So it's nice to have other-worldly things over which to quantify.

5.1.3 Closeness.

'If A were true, C would be true' is true iff C is true at the selected (ie, closest) A-world, where closeness is determined by context. But if the character of our world determines closeness, then it's the character of our world that makes the counterfactual true/false; why bring other worlds into it? Answer: we need the other worlds to talk about the character of our own. And we need to talk about counterfactuals in order to talk about causation. And we need closeness of world to talk about closeness to truth of competing theories — we can't talk about counting (each theory has an infinite number of right and wrong answers), or dominance (they do better and worse with respect to different things). And we need closeness to talk about which questions are the important ones.

5.1.4 Isolation.

Possible worlds have parts. If two things are parts of one world, they are worldmates. A world is the (maximal) mereological sum of worldmates. This is circular. Better: if two things are spatiotemporally related, they are worldmates. What we would call 'overlap' between worlds is better described as perfect duplication at a time/times. Also: if two things are worldmates, then they are spatiotemporally related. A world is unified by the spatiotemporal interrelation of its parts.

Objection: couldn't worlds consist in disconnected spacetimes? Reply: I'd like to say yes, but I have to say no. A world could have world-like parts.

Objection: what about non-spatial worldmates? Reply: as long as they're in time, that's okay. Or if they're omnipresent.

Objection: couldn't there have been nothing rather than something? Reply: no. But this isn't an explanation of why. Of course, in one sense there couldn't have been nothing because there must everything possible. So the fact that no world is empty isn't problematic.

Objection: there could be worlds with Newtonian spacetime, where absolute rest and absolute simultaneity are well-defined. Ours is not that world — we just have the spacetime interval. So, when we talk about spatiotemporal relations in that world, are we talking about the same one, doubled up or something? Or are they different relations? If the former, no problem. But if the latter, then it's not spatiotemporally related. Reply: I don't know. Some pairs of Netwonian/non-Newtonian worlds have the same relations, and others don't. And some worlds are interrelated by even more different relations.

Each world is interrelated by a system of relations that are natural (not gruesome or disjunctive), pervasive (if there is a chain of relations from A to B, then there is a direct relation between A and B), discriminating (many things can stand in them and no two are exactly alike in the structure), and external (not supervening on the intrinsic nature of the individuals, but the composite). It would be nicer to say that any things standing in any natural external relation are worldmates. But what relation(s)? Not non-identity, gen-identity, counterpart, or a primitive. Or like-chargedness. Also, there's no trans-world causation. This follows from the counterfactual analysis of causation, and it's a nice feature that we want to keep.

5.1.5 Concreteness.

I am not sure what 'abstract' and 'concrete' mean in the mouths of philosophers. But this much is true: there are donkeys, other worlds have things that are perfect duplicates of donkeys as parts. So at least some other worlds have concrete parts.

To explain the distinction, one travels one of four ways. 1) The Way of Example: concrete things are like donkeys and puddles, and abstract things are like numbers. This is unhelpful, because we don't know what numbers are. And we don't know how much like donkeys/numbers other parts of other worlds are. 2) The Way of Conflation: the distinction between abstract and concrete *just is* the distinction

between particulars and universals, or individuals and sets. Well, Lewis worlds are individuals and particulars. 3) The Negative Way: abstracta have no location, causal powers, indiscernibility. But sets have location, universals are wholly located at their instances, events might be sets. The Negative Way makes us ask the wrong questions about worlds. 4) The Way of Abstraction: abstracta are concreta minus specificity (or something). But we can abstract highly extrinsic things, or equivalence classes. So, this gets different results from (1), (2), and (3).

5.1.6 Plenitude.

Every way a world could be is a way some world is, and every way a part of a world could be is a way some part of some world is. But if we explain 'ways a world could be' with possibility, then what gets us the plenitude? Nothing. We need a new principle.

Enter recombination, aka The Patchwork Principle. There is no necessary connection between distinct existences. Anything can co-exist with anything else, and anything can fail to co-exist with anything else. Or rather, perfect duplicates of anything can co-exist with perfect duplicates of anything else. All this is size and shape permitting, of course. So what are the possible sizes and shapes? Ask the mathematicians. We can use the Quinean ersatz worlds as representing genuine worlds. But there are alien properties (not instantiated in this world), and aliens (having alien properties or combining non-alien properties in an alien way), so recombination of actual things won't get us everything. But we can recombine alien things too.

5.1.7 Actuality.

'Actual' is an indexical, meaning 'this-worldly'. Every world is actual at itself. There is no property of absolute actuality. First, we couldn't know that we are absolutely actual, since in every world everything that could think would think it's actual. Second, certainly it's a contingent matter which world is actual; so, at some world one world is actual, and at another, another — this is not absolute actuality!

5.2 Lewis — *On the Plurality of Worlds* Chapter 3: Paradise on the Cheap?

Instead of a plurality of concrete worlds, we can get by with one concrete world and a plurality of abstract representations of worlds (and we have a well-understood division between concreta and abstracta). There is (quantifier wide open) only one concrete world. One abstract world is actualized, the rest are unactualized but could have been actualized, though of course they are actualized according to themselves. Same with individuals.

It is wrong to say that ersatzists believe in possible worlds and differ about what they are. They agree with Lewis that certain theoretical roles are filled, but they posit very different things to play them — better not to call them worlds. There are advantages: common sense, much of the work. But there are serious objections to each version.

5.2.1 Linguistic.

Worlds are maximal consistent sets of sentences, and they represent by saying that p either explicitly (a sentence that means p) or implicitly (some sentences entail p). The sentences must have truth-values fixed independently of contexts. The world-making language must be disambiguated and precise. We already believe in these things.

Objection: There aren't enough sentences to represent all the possibilities. Reply: the ersatzer must be able to present the syntax and interpretation of the world-making language, but it needn't be anything like a natural language. She can just use the points of space-time or the real numbers as words and stipulate meanings. Two problems: everything has to have a name, and nothing can have two names. So, we can use the Lagadonian method — every object and universal names itself. Then use state-descriptions — set-theoretic constructions out of predicates and the negation symbol and objects.

But we still need ersatz possible individuals. They are maximal consistent sets of open sentences of the worldmaking language, or maximal consistent sets of

predicates.

Two objections. First, modality is primitive, either via consistency (sentences are consistent iff they're possibly both true) or representation (sentences imply x iff they *couldn't be* true and x false). If the worldmaking language is rich, the problem of consistency is hard and representation easy; if it's impoverished, consistency gets easy, but implicit representation gets hard. We can add some sentences that are axioms; then consistency gets us the rest of the way. Can we specify the axioms without relying on primitive modality? No. Take the axiom of unique charge: nothing is positive and negative. Should all worlds be consistent with it? We don't know! It's risky. We must say it's conditional: if it's possible to be positively and negatively charged, then no axiom. Primitive modality. Also we need linking axioms between local and global sentences, lest we not know if worlds are possible. But why should an analysis of modality require analysis of the link between local descriptions and global descriptions? So modality is primitive for the linguistic ersatzer.

Second, how descriptive is the worldmaking language? If it can be specified by someone in this world, then it cannot distinguish enough possibilities. We also can't say there are indiscernible worlds or individuals. But the latter is certainly possible! And there are differences in what properties things might have; if we only have words for natural properties in the actual world, then we can't describe natural alien properties. And other worlds don't exist in simpler worlds, which limits the accessibility relation. Or she can say there are uninstantiated properties. This means properties can't be sets of their instances, or abstractions from their instances. If she uses Ramsey sentences, the possibilities are conflated.

Summary: three problems. 1) Some state descriptions are inconsistent, and we need modal language to distinguish the consistent ones. 2) We cannot have two indiscernible descriptions, but there might be indiscernible worlds and certainly parts of worlds. 3) What we can describe is limited by what we have words for.

5.2.2 Pictorial.

An idealized, infinite, many-dimensional picture representing the concrete world in all its detail. Pictures represent by isomorphism. Worlds and parts of worlds, then,

represent by isomorphism, and it must be perfect isomorphism.

Objections: 1) Again, we need primitive modality. Not for consistency, but representation. After all, there is no talking donkey for a picture of one to be be isomorphic to. But it *could have been* isomorphic to one. 2) Again, there is conflation of indiscernible possibilities, but in a different way. There can be many indiscernible pictures, but then any world that is correctly represented by one is correctly represented by all.

3) These are just like modal realism! The pictorial worlds, in all senses of 'abstract', are not abstract. Way of Example: the pictorial donkeys are just like donkeys. Way of Conflation: pictorial worlds are individuals, and pictorial people are certainly individuals. Negative Way: the parts must enter into spatial relations in order to represent spatial relations. Way of Abstraction: the pictorial worlds have all the specific detail of the concrete world.

5.2.3 Magical.

Ersatz worlds have no structure, no members, no parts; they are abstract simple 'elements'. Some of them are selected in virtue of the concrete world being a certain way (but they don't really represent, or if they do they do it brutely). Maximal elements are inconsistent with elements they don't imply; only one maximal element (the ersatz actual world) is selected.

Objection: this is more like a theory schema into which many theories (perhaps even my own!) can fit. Reply: no, I deny that the elements are concrete, that they have structure or parts. Objection: you haven't told me much at all about the nature of the elements. Reply: they are structureless abstract simples. Objection: What is it for the concrete world to select an element? Reply: primitive. Objection: modality is still primitive. Reply: Agreed.

Objection: if the selection relation is internal, circularity! There's an element E such that necessarily it is selected iff a donkey talks; E has some distinctive intrinsic property F; F is named 'representing that a donkey talks'; that name singles out an element that is selected iff a donkey talks. We don't know anything about it! You must grasp the relation by magic.

Objection: if the selection relation is external, it is a modal relation. It is a necessary connection, seemingly between distinct things. And for any two things and any external relation, it should be possible that those things stand in that external relation. It is simply magic that the relation holds in the way it does! The same goes for abstract simples playing the role of abundant properties and representing ersatz possible individuals.

5.3 Lewis — *On the Plurality of Worlds* Chapter 4.1,4.3,4.4: Counterparts or Double Lives?

There is a problem of trans-world identity. But it is not a problem about identity, since identity is never problematic. We state problems in terms of identity, but identity is never the problem. One good question is whether worlds overlap. Another good question is whether anything overlaps two worlds.

5.3.1 Representation *de re*.

How does a world represent Humphrey? On modal realism, it might have him as a part. But then he'd have to overlap. Better to say it has a counterpart of him. A linguistic ersatzer might have sentences like, "Humphrey…", or sentences mentioning Humphrey with another name, or a certain description. A pictorial ersatz world would have a picture. A magical ersatz world has some intrinsic nature or brute necessary connection.

Regarding the Humphrey objection, we all agree there are other worlds according to which Humphrey wins the election, though Humphrey himself is not a part of those worlds. Somehow they represent him as winning. Counterpart theory is no worse off. It can say that 'Humphrey' names the trans-world individual (though Lewis doesn't agree).

5.3.2 Against Trans-World Individuals.

There are trans-world individuals, but they are not the things we think and talk about and name. Of course, they're impossible (since they exist at no world), but they exist (quantifier wide open). Composition is unrestricted. We are fine with sums that contrast with their surroundings more than each other, are adjacent, stick together, and act jointly. Trans-world compositions fail all these. But we must admit them.

The Vagueness Argument. It is vague whether a class meets the desiderata for composition, and each desideratum is vague. So restricting composition would

require a vague restriction. But then sometimes it's a vague matter whether composition occurs. But then sometimes it's vague whether something exists. That's impossible. So composition is not restricted.

The only intelligible account of vagueness locates it in our thought and/or language. The reason it's vague where the Outback is is not that there's some thing with imprecise borders, but rather that there are tons of things, and we don't pick out just one with 'the Outback'.

So if there is unrestricted composition, why aren't there trans-world individuals? There are. But when you say things of Humphrey, you don't talk about a trans-world individual. You talk about a man and his counterparts. Everything you say that seems to imply trans-worldness can be restated in counterpart talk.

Why trans-world sums aren't like trans-time sums: 1) no causal dependence, 2) no short-range similarity, 3) modality has tons of fission and fusion and such cases. Also, for persons, there is no cross-world self-interest.

5.3.3 Against haecceitism.

The main thesis is a supervenience one: hacceitism is the thesis that it's possible that two worlds differ in what they represent *de re* but do not differ qualitatively. The forms of modal realism (genuine or ersatz) congenial to haecceitistic differences are problematic: genuine with overlap, or ersatz) are not congenial to haecceitistic differences. And there is a cheap substitute for haecceitism.

On genuine modal realism, haecceitistic differences are totally mysterious. Why does a certain thing represent Humphrey as having won? It is a trans-world relation that isn't identity — a non-qualitative counterpart relation. But any two things stand in infinitely many relations, share infinitely many properties, and are parts of infinitely many sums. Are some of them special? Which ones, and why? They aren't qualitative joint-carving ones…

The cheap substitute allows us to say that there are distinct possibilities; it is that possibilities are not possible worlds. They can be possible individuals, and other parts of possible worlds. Of course every possible thing is part of some possible world, but we don't count distinct possibilities by counting the worlds; one world

provides many possibilities. If I might have been either of a pair of qualitatively indiscernible twins, then both are counterparts of me, under different counterpart relations. Representation *de re* is not done by worlds, but by possible individuals within worlds.

Pictorial ersatzism is so much like modal realism that they two stand or fall together; with overlap, it is amenable to haecceitism but mysterious, and without it is not so amenable. Magical ersatzism is already magical, so may as well add some magical haecceitism. Linguistic ersatzism is amenable as long as the worldmaking language includes proper names. But since we can't name non-actual individuals, we'll have to do without haecceitism for them. Of course, the linguistic ersatzer needn't endorse haecceitism. She could construct the worlds with names and then Ramsify, or leave out the proper names altogether. But then she needs a story about representation *de re*. Presumably it will be about relations between the ersatz Humphrey (which is a purely qualitative description of actual Humphrey) and other ersatz Humphreys, deserving the label because they stand in some suitable relation to Humphrey. What relation? Not qualitative similarity, because they are just descriptions. It probably needs to be primitive.

Extreme haecceitism is more defensible than moderate haecceitism, since we don't have to draw a line and then argue that there was good reason to draw it there. Could I have been a poached egg? The extreme haecceitist can say no (in line with common sense), and that her answer of 'no' is restricted.

Argument for haecceitism: Chisholm's Paradox. We can trace a super-long chain of small qualitative differences from world to world until we end up with something totally unlike what we started with. Solution: deny that the counterpart relation is transitive. Or: deny that accessibility is transitive. Objection: accessible or not, they're still worlds!

5.4 Plantinga — Actualism and Possible Worlds

Goal: An analysis of possible worlds that doesn't make us believe there are or could have been things that don't exist.

5.4.1 The Canonical Conception

Possible worlds are taken as primitive, and thought of as ways things could have been. One (α) is actual. The rest are possible. Each world W has a domain (ΨW). The members of ΨW are the objects that exist in W. There is a union U of all the domains.

Propositions are sets of possible world, or functions from sets of worlds to truth values. A proposition p is true in W if p is a member of W. Necessary propositions are true in all worlds, possible propositions are true in at least one world, impossible propositions are not true in any worlds. Properties are functions from possible worlds to sets of n-tuples of members of U. The extension of P in W is all the things in W that are P.

'$\exists xFx$' is true in W only if something in ΨW is F.

Problem: this conception doesn't rule out that there's something in U that's not in $\Psi\alpha$. That is, there are or could be things that don't exist. One could try to rule that out, but this is plausible: Possibly, there exists something not identical to anything in α. Or, go to some where I don't exist; in that world, there is something (me) that doesn't exist. So possibly, there is something that there isn't.

5.4.2 The Actualist Conception

Actualism is the view that there neither are nor could be nonexistent objects.

Worlds and Books States of affairs obtain or are actual. They all exist, even the impossible ones. A possible world is a maximal possible state of affairs, where A is maximal just in the case that for every state of affairs S, A either includes or precludes S. A includes S if it is not possible that A obtain and S fail to obtain. A precludes S if it not possible that A and S both obtain. α is the actual maximal state of affairs. So

α is an abstract object. Propositions may be states of affairs, or may not be (though Al thinks not, since states of affairs are neither true nor false). p is true in W if it is not possible for W to be actual and p be false. The set of propositions true in W is the book on W.

Properties x has P in W iff it is not possible that W be actual and x have the complement of P. Or: x has P in W if W includes x's having P. But we can't think properties are functions or sets. (i) No distinct but necessarily co-extensive properties. (ii) In worlds in which Quine does not exist, no sets containing him exist. But 'is a philosopher' contains him. So there is no property 'is a philosopher' in worlds in which Quine does not exist.

x has P essentially if x has P in every world in which x exists; x has P accidentally if x has P in at least one but not all worlds. Modality de dicto is a special case of modality de re; propositions and truth (since all propositions exist in all worlds).

Essence and the α transform An essence of x is a property x has essentially, and that nothing else has. Hacceities are one; world-indexed properties are others (but not all world-indexed properties, only ones satisfied only by x). For any property P, P-in-α is P's α-transform. For any definite description $(ix)Fx$ that denotes Quine, there is a description $(ix)F_{\alpha}x$ that essentially denotes him.

Domains and Propositions Two differences from the canonical conception. (1) Domains are contingent, since if objects aren't actual, there aren't any sets that contain them. But worlds are necessary, so worlds do not have their domains essentially. Had Socrates not existed, the domain of α would not have included Socrates. (2) The domain of any possible world is a subset of the domain of α.

Two other things. First, domains exist in other worlds but not as domains of those worlds. So '$\forall xFx$' isn't equivalent to 'for every member of D, it's F'. Second, worlds can't have their domains essentially because then worlds couldn't exist without their domains, but their domains could have non-existent objects in other worlds.

Essences and Truth Conditions How the actualist affirms (P): there could have been something distinct from anything in α — essences. Essences are necessary beings (like all properties). Essences don't essentially have the property of being exemplified. Thus (P) is true if and only if there is a world where (P*: there is an object that does not exist inα) is true. But (P*) is true in a world *W* if and only if there is an essence that is exemplified in *W* but not in α. (P) is true, therefore, if and only if there is at least one essence that is exemplified in some world but not exemplified in fact — if and only if, that is, there is an unexemplified essence. Hence (P) is very likely true. As actualists, therefore, we may state the matter thus: (35) although there could have been some things that don't in fact exist, there are no things that don't exist but could have.

De re vs de dicto: the proposition that Ford is not ingenuous is true in W iff Ford exists in W and lacks ingenuity. The proposition that it's not the case that Ford is ingenuous is true in W iff it's not the case that the proposition that Ford is ingenuous is true in W. The latter is true a lot more often than the former, since the former requires the existence of Ford.

5.5 Rosen — Modal Fictionalism

5.5.1 The Problem

The language of possible worlds has become an indispensable tool, but believing in non-actual worlds is crazy. One option is to interpret apparent quantification over possible worlds as misleading, and lacking the usual implications. The ersatzist denies that there are really worlds, and the realist believes in the crazy stuff. Deflationism would be nice. Options: not the existential quantifier (Meinongian or substitutional), misleading surface form containing no quantifiers, fictionalism.

5.5.2 Fictionalism

'There is a blue swan world' is like 'There is a brilliant detective at 221 Baker Street'. Taken as a straightforward existential claim it's false, but there are conversational contexts in which it's correct, or perhaps even true. These contexts have silent prefixes 'in the Holmes stories…'

Even if they're not true, some people say them without being committed to believing that a detective lives at Baker Street. Quantifiers within story prefixes are not existentially committing. Story prefixes can also be things like 'according to the Monadology'.

First: specify the story. The possible worlds claims must come out true. Lewis' ontology allows for this, so let's start with 'according to modal realism'. Take an arbitrary modal proposition p. Lewis has a non-modal paraphrase p^*. Lewis thinks: p iff p^*. The fictionalist thinks: p iff according to modal realism, p^*.

5.5.3 The Fictionalist's Fiction

Postulates:
(6a) Reality consists in a plurality of universes or 'worlds'.
(6b) One of these we ordinarily call the universe: the largest connected spatiotemporal system of which we are parts.
(6c) The others are things of roughly the same kind: systems of objects, many of

them concrete, connected by a network of external relations like the spatiotemporal distances that connect objects in our universe.
(6d) Each universe is isolated from the others; that is, particulars in distinct universes are not spatiotemporally related. (It follows that universes do not overlap; no particular inhabits two universes.)
(6e) The totality of universes is closed under a principle of recombination. Roughly: for any collection of objects from any number of universes, there is a single universe containing any number of duplicates of each, provided there is a spacetime large enough to hold them.
(6f) There are no arbitrary limits on the plenitude of universes.
(6g) Our universe is not special. That is, there is nothing remarkable about it from the point of view of the system of universes.

But an extravagant actualist can embrace all of these, and insisting that they're all actual; there's no modal vocabulary. We must add something like (7) The universes are merely possible worlds (except ours). But since the fictionalist does not add this, it is not exactly modal realism. Also, the fictionalist must make sure to give an encyclopedia — a list of the non-modal truths about the intrinsic character of our world; this, plus (6e), gets us rich modal space. Call (6)+encyclopedia 'PW'.

5.5.4 The Fictionalist's Theory of Possibility

The modal fictionalist says that for any modal claims p, p iff according to PW, p^*. These claims are utterly uncontroversial, but that is as it should be, since it is utterly controversial that there might have been blue swans.

Consider the counterfactual: (9) If swans were blue, ducks would be pink. The realist paraphrases this as: (9r) In each universe that differs from ours as little as the blueness of swans permits, ducks are pink. So the fictionalist offers the obvious parasitic analysis: (9f) According to PW, every universe that differs as little from ours as the blueness of swans permits is a universe where ducks are pink. The fictionalist thinks (9r) is true (vacuously). And (9f) is obviously false, just like (9).

A nice consequence is that when the realist believes her account p^* of the modal claim p, she judges p^* true on the basis of a theory she accepts. But this is precisely

what the fictionalist is interested in: the truth value of the realist's paraphrase according to the realist's theory. So, if the modal realist is in a position to regard her analysis as adequate in the minimal sense of ratifying a substantial body of prior modal opinion, the fictionalist is as well.

5.5.5 Ontology

Fictionalism has no revisionary ontological consequences, assuming we already believe in stories or other representations. But it is convention to take these as abstracta, so nominalists might not like it.

5.5.6 Epistemology

Modal realism often faces the charge that if its analysis of modal statements is correct, we have no reason to think we know any modal truths; we ought to be modal skeptics. In response, Lewis says our imagination takes what we know empirically, recombines it non-arbitrarily, and delivers modal knowledge. Why is this 'way of imagination' a reliable way of getting at modal truths? The realist responds: (i) the modal truths are truths about a domain of universes; (ii) the principles which guide our imagination are true of that domain; so (iii) by and large, when we imagine in accordance with these principles the states of affairs we imagine are realized somewhere among the universes. But (ii) is quite a striking conjecture!

The fictionalist has no such problem. When we imagine, we imagine what it would be like if PW were true. And for the fictionalist, these *just are* the modal facts!

5.5.7 3 Problems

The Incompleteness Problem. In some rather marginal cases, the fictionalist and the realist must disagree about what the modal truths are. Take the claim that (10): 'there might have been K non-overlapping physical objects' (where K is a cardinal number larger than the number of space-time regions in our universe). The realist paraphrases this as (10r): 'there is a universe with K non-overlapping

physical objects'. She thinks it has a truth value, she just doesn't know what it is. The fictionalist paraphrase is (10f): 'according to PW, there is a universe with K non-overlapping physical objects'. This is false, or truth-valueless. Either way, it is not true, whereas we don't know whether the realist's assertion is true or not.

The most natural is to say that (10f) is false, since it implies that realism settles the question of (10). But then the fictionalist should think the denial of (10) is true, namely (11): 'It's not the case that there might have been K non-overlapping physical objects'. But the fictionalist analysis of (11) should have the same truth-value problem as (10f), and thus either be false or truth-valueless. So the fictionalist must say that a modal sentence and its negation (10 and 11) are both false.

So, suppose (10) and (11) are truth-valueless. Problem 1: the logical connectives, when applied to modal statements, are not truth-functional. '(10) or (11)' is a logical truth. Problem 2: If someone prefixed 'in the Holmes stories' to something that the Holmes stories were silent about, we would say that what they said is false.

Primitive Modality. How to explain 'according to the fiction'? We can't use 'if PW were true…' or 'if we suppose PW…' since those are modal notions. So the fictionalist's device is a modal operator. Problem 1: It's not comprehensive enough; we can't reduce all modal locutions with it like the realist can. Reply 1: if we must call it a modal operator, then that's true. But we can reduce a wide variety of modal notions to one. Reply 2: if we must call it a modal operator, then how does the realist reduce it? For the realist, a representation of the totality of worlds is either necessarily true or necessarily false. The content, if it is to be a set of worlds, must therefore be either the set of all worlds or the null set. And neither will do to capture the very determinate content of stories like 'This Lonely World', or for that matter, PW itself. The fictionalist is in the same position.

But one might still be dissatisfied. It just doesn't *feel* like the right kind of primitive. It doesn't alleviate anxiety about the legitimacy of modal talk. But Rosen doesn't know how to give a non-modal consequence relation which determines what is true according to PW.

There are two goals. One is to reduce modality. The other is to be able to use modal talk without an ontology including possible worlds. The fictionalist fails the

first to a degree, but succeeds at the second.

The Argument from Concern. Kripke's Humphrey objection shows us that we ought to care about modal statements. But on fictionalism, they're just about what's true according to a story. Would Humphrey care? Presumably not. We regret what we've done because we think we could have done otherwise, but if that just means that according to PW, we do otherwise in some worlds, we would be indifferent.

The fictionalist could just dig in her heels; facts about what we could have done just are facts about the fiction, so we should really care about the fiction. And only this fiction; not the Holmes fiction. And if you are concerned about some members of a class and not others, you should be able to point to some feature distinguishing the ones you care about. But if someone asks 'why that feature', should you have to point to another feature, and so on? And perhaps PW derives its 'authority' from being an explicit formulation of our own imaginative habits

But we wanted a license to move between modal claims and worlds claims. We get that with the biconditionals. So the fictionalist may claim not to be providing an analysis, but merely linking facts without ontological commitment.

5.6 van Inwagen — Two Concepts of Possible Worlds

The debate is concretism vs abstractionism. Agreement: there are many ways things could have been, there are possible worlds, possible worlds are maximal. Call an 'A-world' an abstractionist possible world, and a 'C-world' a concretist possible world; it doesn't follow that they *mean* those things when saying 'world', though.

A-worlds. Take 'state of affairs', 'obtains', and 'conjunction' as primitive. x includes y iff it is impossible for x to obtain and y not obtain. x is an A-world$=_{df.}$ x is a possible state of affairs, and the conjunction of x and any state of affairs not included in x is not a possible state of affairs.

C-worlds. Take as primitive the notion of objects being spatiotemporally related. O is spatiotemporal if for any x and y, if x and y are parts of O, x and y are spatiotemporally related. x is a C-world$=_{df.}$ x is spatiotemporal and the mereological sum of x and any object not part of x is not spatiotemporal.

If the concretist says that a state of affairs is a set of worlds, and that x includes y iff x is a subset of y, and that maximal states of affairs are sets whose sole members are maximal with respect to spatiotemporal interrelatedness, then A-worlds are C-worlds. The abstractionist will find this crazy, since states of affairs aren't concrete. The concretist can respond by not understanding the distinction.

A state of affairs 'x is A-actual' means 'x obtains'. For the concretist actuality is indexical, so a world 'x is C-actual' means 'I am a part of x'. Abstractionists do not apply 'is actual' to concrete objects, since that doesn't mean anything more than 'non-existent'; there aren't and couldn't be non-actual concrete objects.

There are objects that exist only in other possible worlds. The concretist and abstractionist will mean different things by this. For the concretist I'll use 'in', and the abstractionist 'at'.

Abstractionist: two contexts — propositions and objects. p is true at the A-world $w=_{df.}$ w is an A-world, and if w were actual, p would be true. x exists at the A-world $w=_{df.}$ w is an A-world, and if w were actual, x would exist.

Concretist: no such nice definitions — 'in' functions like 'in Australia'. So we'll

have to take something like 'from the point of view of w' as primitive.

But how to make sense of 'is actual'? For the abstractionist, '*x* is actual=$_{df.}$ *x* exists at the A-actual A-world' just means '*x* exists', which is no good. But the concretist will like '*x* is actual=$_{df.}$ *x* exists at the C-actual C-world'. '*x* is C-actual'=$_{df.}$ 'every part of *x* is spatiotemporally related to me'. Also, while hairless horses exist, in most contexts we restrict our quantifier to actual things.

5.6.1 Equivocation?

Seemingly no. Here's a way to make it not so: 'possible world' is a functional concept. Possible worlds play certain roles. Which ontological concept, A-world or C-world, is coextensive with the functional concept 'possible world', 'actual', and 'in/at'? (Ontological concepts are things of a kind.) They are both talking about possible worlds, and at most one of them is right.

5.6.2 Pros and Cons

Concretism: Pros: 1) reductive analysis of modality, 2) does the work for which it's designed. Cons: 1) Modal statements are equivalent to nonmodal ones that have different truth-values, 2) evokes incredulous stares, 3) is incredible, 4) requires counterpart theory.

Abstractionism: Pros: 1) is credible, using only what we already need. Cons: 1) No reductive analysis, 2) cannot do the work for which it's designed.

True reductive analysis? 1) There is no million-carat diamond, but there could have been. Equivalent to 2) No million-carat diamond exists in the actual world, but a million-carat diamond exists in some possible world. On concretism, this is equivalent to 3) No million-carat diamond exists in the C-actual C-world, but a million-carat diamond exists in some C-world. Which entails 4) No million-carat diamond is spatiotemporally related to me, but there is a million-carat diamond. (4) contains no modal terms. But this is only a virtue if the analysis is correct.

Objection 1: (4) is a first-person sentence, and (1) is not. Objection 2: 'there is a million-carat diamond' is a conjunct of (4), and 'there is no million-carat diamond'

is a conjunct of (1). Reply: the domain in (1) is restricted, and not in (4).

Objection 3: Though there could have been a million-carat diamond, there is (unrestrictedly) none, and nothing that is spatiotemporally related to anything is spatiotemporally unrelated to me. Reply: bite the bullet.

Objection 4: Trivially, any possible physical configuration is a C-world configuration, even if there are only 17 C-worlds. Reply: There can't be 17. The world-space must be complete; there are at least 2^c C-worlds. Rejoinder: What principled reason is there to think so? Since there is no reason to think so, then C-worlds are not ways C-worlds could be.

Can Abstractionism do the Work? Lewis supposes there is linguistic, pictorial, and magical abstractionism. He believes (i) they can all be refuted, (ii) all abstractionism is of one of these types, and (iii) abstractionists are too unclear to distinguish which version they believe. Let's grant (ii) and (iii), and that Lewis can refute linguistic and pictorial abstractionism.

Outline of linguistic (represent like sentences) and pictorial (represent like pictures) abstractionism and Lewis' objections. Linguistic: cannot formulate the thesis that the actual world doesn't contain all properties. Pictorial: if it has enough detail, it is a world; if it doesn't, it doesn't represent the world.

Magical: worlds are propositions. Propositions are true or false and not both. They are made true by things; they are true iff they correctly represent the world. They have their truth-value dispositions (the conditions under which they are made true) essentially. There is one C-world, and the C-world bears the *makes true* relation to propositions. It bears that relation to only one maximal proposition — the actual A-world.

Lewis' objection. If magical ersatzism is true, we couldn't grasp the *makes true* relation. She hasn't said what the relation is, she has made negative statements about what it's not and when it doesn't hold, and there are infinities of relations satisfying the conditions. *Makes true* is either internal or external. If external, then since the intrinsic properties of the C-world are relevant to whether it bears *makes true* to some proposition p, we must conclude that the intrinsic properties of p are irrelevant to

whether the C-world bears *makes true* to *p*; but the modal implications of *makes true* tell against this.

If internal, how did we manage to grasp it? For a configuration of spatiotemporal objects to bear a graspable internal relation to a proposition must be for the structure of the proposition to match the structure of the configuration, but you say propositions have no structure. If you say they have a nature, how did you grasp it, since they're nonspatiotemporal? All you can do is specify what makes them true. Of course, this is the same problem for anyone who thinks bearers of truth-values are other than individuals and sets.

That is: *makes true* is an internal relation, holding between objects purely in virtue of their intrinsic features. But if you can only distinguish among the objects by considering what each bears *makes true* to, then you don't know of any intrinsic features of each that differentiate them. And you must do that to understand any internal relation. You say that the one C-world bears *makes true* to some but not all propositions, but you can't differentiate the propositions from each other except by using '*makes true*'.

PvI's Tu Quoque Something must be wrong, otherwise concretism or another abstractionism would be true, and they're not. So, a *tu quoque*: if Lewis is right, one can only grasp set membership by magic.

Consider three objects: *x*,*y*,*z*. Consider {x,y},{x,z},{y,z}. Do we understand *member of*? We can only individuate the sets using '*member of*'. So, if membership were internal, we couldn't grasp it. But there's more. Call the objects bearing a relation its range. A relation is range-internal if necessarily, whatever bears it to a thing also bears it to all other things having the same intrinsic properties. So, 'x is 10 feet from something the same color as y' is range-internal. If Lewis' principle about internal relations is right, the corresponding range-internal principle should be right.

And set-membership is certainly range-internal. It's not clear what the intrinsic properties of {me,the moon} is, other than being a set. Perhaps containing a certain object, or containing various numbers of objects with certain intrinsic properties. But either: (i) all properties of those types are intrinsic and it has no others, (ii)

all properties of the first are intrinsic and it has no others, (iii) all properties of the second are intrinsic and it has no others, or (iv) neither are intrinsic, and the only intrinsic property is *being a set*.

If (i) or (ii), then membership is range-internal; thus, we do not understand membership. If (iii) or (iv), then membership is purely external. But if membership is purely external, then how is Tom in {Tom} necessarily? If *x* and *y* have the same intrinsic properties, why can't *x* be in {y,z}? At any rate, if we don't understand *makes true*, then we don't understand set-membership.

If we don't understand set-membership, we don't understand classical mathematics or modal realism. So, we understand set-membership, and thus we can understand *makes true*.

5.7 Williamson — Necessary Existents

It seems obvious that I, along with everything else in space and time, could have failed to exist. But there is a proof of my necessary existence, and it generalizes.

5.7.1 Proof of my Necessary Existence

(1) Necessarily, if I do not exist, then the proposition that I do not exist is true.

(2) Necessarily, if the proposition that I do not exist is true, then the proposition that I do not exist exists.

(3) Necessarily, if the proposition that I do not exist exists, then I exist. Reason: if I do not exist, there is nothing for the proposition to state the nonexistence of.

(4) Necessarily, if I do not exist, then I exist. (1,2,3)

(5) Necessarily, I exist. (since my nonexistence implies a contradiction.)

There are parallel proofs using 'at all times', and one can replace 'I' with anything.

5.7.2 Examining the premises

Premise 1. Instance of (1+): Necessary, the propositions that *p* is true iff *p*. If (1+) isn't true, we have no reason for using 'the truth of the premises necessitates the truth of the conclusion' as our notion of a valid argument, since such talk assumes the existence of propositions and eschews talk of what's going on in the world. We also assume (1+) in counterfactual reasoning. (1+) excludes some theories of propositions. For example, that phrases denote strings of letters. What about the proposition that this proposition is not true? If (1+) is true, contradiction; we must deny there are such propositions.

What about in/at (Williamson uses 'of' instead of 'at)? The distinction is vexed, and leads to (i) a circularity, since we define validity in terms of possible worlds (specifically, we define 'complete' in terms of possible worlds), but proponents of the in/at distinction explain possible worlds in terms of validity, and (ii) an illusion of a distinction between truth in a world and truth of a world for propositions because we appear to be able to model such a distinction on a corresponding distinction for

utterances, forgetting that the presence of the latter depends on the absence of the former. The true-of relation between an open sentence and an object depends on the assignment of the object to a variable in the open sentence. So the proposition that I do not exist depends on the assignment of me to a variable; thus, I must exist.

Premise 2. Instance of (2+): Necessarily, if the proposition that *p* is true, then the proposition that *p* exists. In order for something to have a property (in this case, truth), it must exist. The in/at distinction doesn't undermine (2+), since (2+) only concerns truth in a world.

Premise 3. Instance of (3+): Necessarily, if the proposition that P(*o*) exists, then *o* exists. ('*o*' is to be replaced by a referring singular term, not a definite description.) The reason for this is a Russelian view of properties: *o* is a constituent of P(*o*); the contribution of '*o*' to 'P(*o*)' is *o*.

But (3+) is plausible even on Fregeanism. Propositions are structured, but the contribution of '*o*' to 'P(*o*)' is a mode of presentation of *o* — a sense. But could there be a proposition about that dog without the existence of that dog? Even if one thinks propositions are unstructured, the intuition remains, as long as '*o*' is singularly referring.

A Subtle Objection to 3. The argument for (3+) assumes that when we use the phrase 'the proposition that P(*o*)' in speaking of a counterfactual situation (in the scope of 'necessarily'), we thereby refer to something which would have the corresponding property (of being a proposition to the effect that P(*o*)) in the counterfactual situation. But there is another possibility. Perhaps we are using the phrase 'the proposition that P(*o*)' to pick out the object which has that property in the actual situation and then talking about how things could have been with that very object in a counterfactual situation, whether or not it had the property in the counterfactual situation. (Compare 'the winner could have been someone else' vs 'the winner could have lost'.)

Let *p* be the actual proposition that P(*o*); *p* has a relation to o, but in some counterfactual situation mightn't have been the proposition that P(*o*). On the

alternative reading, (3+) says that, necessarily, if *p* exists then *o* exists; thus we lose our reason for accepting (3+), and with it our reason for accepting (3). Perhaps the object which actually has the property of being a proposition to the effect that I do not exist would have lacked that property if it had been true.

Reply. But if the actual proposition that I do not exist would not have been a proposition to the effect that I do not exist if I had not existed, why should it have been true in those circumstances? On the reading which the objection requires, (1+) says that, necessarily, *p* is true if and only if P, even if *p* could have lacked the property of being a proposition to the effect that P. But in circumstances in which *p* is not to the effect that P, why should it be true if and only if P?

5.7.3 Objection: why believe the conclusion?

The motivation for believing (2) and (3) is that if a given thing doesn't exist, there's no such thing as it, and therefore nothing to which to ascribe a property. Let's say that '*x* logically exists' means '$\exists y(y = x)$'. Whatever can be counted logically exists, including past things and fictional things. In this sense, I exist. And necessarily so. Note that not everything that logically exists is concrete. And not everything that is not concrete is abstract; there are ex-concrete objects, and possibly concrete objects. Don't read 'possible concrete object' as 'concrete and possible', but as 'it is possible that it is concrete'.

The claim that merely possible physical objects are unperceivable must be formulated with care. What is true is the *de dicto* claim that it is impossible that someone perceives some merely possible physical object. But the corresponding *de re* claim is false, that for some merely possible physical object it is impossible that someone perceives it.

5.7.4 Objection: Identity Conditions?

Two very different states are possible for you. You're capable of being an embodied person, knowing, feeling and acting in space and time. You're also capable of being a merely possible person, disembodied, spatiotemporally unlocated, knowing

nothing, feeling nothing and doing nothing. Is so radical a difference in properties consistent with the identity of the object?

Reply: they're not so different. The merely possible person has unactualized potential to be like the person, while the person actualizes the potential. If A could have been distinct from B, then A is distinct from B. If necessarily Fs are identical iff they stand in R, then possible Fs are identical iff they could each be F and stand in R.

5.7.5 Objection: Bloated Ontology

Any sperm and egg could have resulted in a person, so for every {sperm,egg} there's a possible person. Similarly for other animals.

Reply: Ockham's Razor? But we *do* have reason to posit the entities: the argument. And it simplifies logic (licensing BF/CBF) and semantics (one domain).

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