Durham E-Theses

The ontology of haecceities

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The Ontology of Haecceities

A Solution to the Problem of Distinction

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Short Thesis Abstract

This thesis deals with the Problem of Distinction, i.e. what explains the distinction of two substances, especially when they are qualitatively indiscernible? It argues that the best solution to this problem is an ontology of *haecceities*, properties like "being identical with X" which is unique for X and responsible for its individuation.

This is achieved in two steps. In the first half of the thesis (Chapters 2 to 5), the nature of the Problem of Distinction is clarified and Principles of Evaluations of the solution to the Problem of Distinction are set out. Then based on these Principles, the thesis argues *against* the main extant non-haecceity solutions to the Problem of Distinction including the Spacetime Points Solution, Bare Particularism, Trope Theory, and the Universal Bundle Theory.

In the second half of the thesis (Chapters 6 to 9), it develops a novel ontology of haecceities. A Haecceity Mereology with three rules is proposed. According to this ontology, the reality is constituted by two fundamental kinds of properties, universals and haecceities. An individual substance is a special *mereological* sum of a haecceity and its correspondent universals. Hence, there are two distinct substances because of the distinction of two haecceities. Besides solving the Problem of Distinction, the ontology of haecceities also explains many other things such as the unity of substances. Further, we argue that, although our knowledge of substances is epistemically fallible, the relationship between a haecceity and its correspondent universals is metaphysically necessary.

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An article based on some of the material in Chapter 5, entitled "*A New Universal Bundle Theory*" has been published in *Philosophia* (2018) 46 (2): 473-486. This is an open access article. I am grateful to the editor for accepting it. The copyright of this thesis rests with the author. No quotation from it should be published without the author's prior written consent and information derived from it should be acknowledged.

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Contents

Chapter 1
Thesis Introduction

Imagine a universe containing only two spheres, which are exactly similar in every respect (Black 1952). In spite of its seeming simplicity, such a universe gives rise to intriguing philosophical puzzles. One of them can be expressed as follows: What makes the two spheres *two rather than one*, given that they seem to be qualitatively indiscernible? This is one classic form of the *Problem of Distinction*. Different solutions have been offered, but no comprehensive comparison and evaluation of these various solutions has yet been set out in the literature.

Aims

This thesis has two related aims, and two main parts correspondingly: the first part sets out a systematic evaluation of the various representative solutions to the Problem of Distinction (PoD). In doing so, we will consider a variety of metaphysical theories and propose some new arguments against the solutions that these theories underpin.

The PoD has a long history, certainly having been discussed by the ancient Greeks, and it is often taken to be the same as what many philosophers today call the "Problem of Individuation" (Chisholm 1975, Moreland 1998). But strictly speaking, as has been pointed out by the medieval philosopher Duns Scotus and many others, the Problem of Individuation not only asks for the explanation of the *distinction* of substances, but also for an explanation of their *indivisibility* or unity (see Łukasiewicz, Anscombe and Popper 1953). Adopting the perspective of analytic metaphysics, the main focus of this thesis is specifically on the Problem of Distinction (namely, what makes two objects (individual substances)[1] distinct rather than identical?), although it will also take the Problem(s) of Indivisibility into consideration when evaluating the solutions (e.g. see Chapter 3(B) and Chapter 6(C)).

The second main part of the thesis defends a solution using "haecceities" and develops a detailed *ontology of haecceities* that brings a variety of benefits. It will be argued that there are two distinct substances in the Blackian case *because* there are two *haecceities*.

Haecceities are non-qualitative properties like "*being identical with Quine*", which are responsible for individuation (see for instance, Adam 1979, 1981, 1986, Rosenkrantz 1993, Lycan 1994 and Diekemper 2009, 2013, 2014.) Haecceities have been employed in various contexts in contemporary discussions, but a thorough clarification of haecceities and related notions is still lacking. For instance, the term "*haecceitism*" has gained some popularity in modal metaphysics and is often taken to be a *denial* of the following thesis: Facts about what worlds represent *de re* supervene upon facts about the qualitative properties of worlds (Kaplan 1975, Lewis 1986, Skow 2008, Fara

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[1] We will use "object", "individual", "particular", and "substance" interchangeably unless otherwise noted.

2009, Stalnaker 2012, Cowling 2016). But such a denial does not necessarily commit one to any realist notion of "haecceities". For example, an advocate of haecceitism as such could accept that qualitatively identical worlds are primitively distinct, rather than grounding the distinction of worlds in terms of haecceities. To avoid confusion, we will not use the term "haecceitism", because its current usage concerns modal metaphysics rather than the ontology of haecceities.

Also, the extant accounts of the realist notion of "haecceity" and its ontology are still unsatisfactory, partly because they all fail to locate the notion in the *centre* of ontology, in that they do not offer a complete analysis of the *structure of objects* using the notion. For instance, although Rosenkrantz (1993) argues for the reality of haecceities, the two basic kinds of entities in his ontology are the abstracta and the concreta, and he says nothing about the detailed relationship between an abstract haecceity and a concrete particular. Some improvements can be seen in Diekemper (2015), where Diekemper considers how to understand haecceities within *other* given systems like Lowe's four-category ontology and Loux's Aristotelian model, but still we do not find a self-contained system which uses haecceities as the fundamental building blocks of reality. More recently, in many places Ingram (2018) makes heavy use of haecceities to develop his presentism, and holds that a haecceity "only depends on the *initial* existence of the relevant object, not its *continued* existence" (p. 447). But the core idea is just that haecceities are properties (as everyone talking about haecceities would agree) which are temporally dependent on objects, and again, it is not clear that Ingram's theory alone is an adequate ontology, via which an analysis of concrete objects could be found.

By contrast, in the ontological system developed in this thesis, properties (universals) and haecceities are all we need for reality making. In fact, this is one of the first detailed ontologies of haecceities in the recent literature. According to our ontology, a substance is a special *mereological* sum of a haecceity and certain properties, and it lies in the nature of a haecceity that it "haecceitifies" certain properties. As a novel theory of the nature of objects, our ontology attempts to provide a middle way between the traditional bare particularist picture and the bundle-theoretic picture.

General assumptions

In defending the haecceity solution to the Problem of Distinction and developing an ontology of haecceities, we shall assume with good reason that the Blackian universe is metaphysically possible, and that the Problem of Distinction is a legitimate, non-trivial problem. (After all, there are many other similar cases of distinction that we cannot ignore, as will be shown in Chapter 2.) Like many philosophical problems, even if there is a chance that no solutions are successful and the PoD is insolvable, such a lesson can only be learned *after* our endeavour. For this reason, before the theory of haecceities is fully developed and evaluated, we will *not* consider the "primitivist" position according to which there is nothing to be explained and the two spheres are primitively distinct. Relatedly, we shall also assume that finding a satisfactory "metaphysical explanation" of a certain datum is a

reliable method for our inquiry, because one virtue of a good theory is that it is explanatorily powerful (see Chapter 3(B)).

Moreover, we shall assume that reality has certain *ontological categories*, regarding which the existence and identity conditions for their members cannot be *exhaustively* specified in terms of ontological dependence relations they bear to entities of *other* categories. Hence a category is the most fundamental kind of beings (Lowe 2006, pp. 5–8). Further, we shall assume that one such category we clearly have is "properties" (hence versions of "nominalism" will be put aside). Unless otherwise suggested, I take qualitative properties to be *universals*, which could be instantiated by more than one *individual substance*. The notion of "substances" can be intuitively understood as property-bearers, namely, things which have properties, and at most times they correspond to ordinary objects like persons, trees, tables, spheres and atoms, but note that we will *not* take the "bearing relation" or "having relation" between properties and substances to be purely primitive, because we will *analyse* that relation via mereology and haecceitification (see below).

Although it may be true that many of our points about haecceities still stand even if some of these assumptions are given up, it is still convenient to start with these assumptions, since the notion of universals has a prestigious history and is still one of the most popular positions on properties today. In fact, we would be left with a very disunified view if we were realists about non-qualitative properties like haecceities on one hand, while being nominalists about other properties on the other. Further, it will be explained later how the notion of haecceities makes the other main alternative to universals, *tropes*, less fundamental or even redundant (see Chapter 7).

Finally, although it will be unavoidable in some places to speak of possible worlds or possible situations, we will not take a particular stance on the metaphysics of possible worlds. Our primary concern will be the Problem of Distinction *within a world*.

Overview of the chapters

Our journey begins with the clarification of the Problem of Distinction. In Chapter 2, it is argued that the Problem of Distinction should be distinguished from the Pairing Problem (or the problem of "which is which"), though these two problems are related. There are cases where the Problem of Distinction can be raised but the problem of which is which does not apply. In order to explain a given "distinction fact" for some entities, we need to look for other facts to ground it, rather than tell which entity is which.

It will also be argued that the solution to the Problem of Distinction should not only deal with *special cases of distinction* (like the symmetrical spheres), but also any *general cases of distinction* (like the distinction between an apple and a banana, or between two immaterial entities like angels). As will be shown in Chapter 2, there seems to be no good reason to treat the general cases of distinction and the special cases of distinction differently. It is argued that, even for the most obvious

cases of distinction, appealing to some *properties* of substances to explain the distinction of substances may still be *circular* or *regressive*. Thus, a solution to the Problem of Distinction would be preferable if it were to explain both the special cases and the general cases of distinction. If there is an interesting problem about explaining the distinction of the two spheres at all, the same could be said for the distinction between a particular apple and a particular banana.

To evaluate different solutions systematically, a classification of the solutions and certain principles of evaluation ought to be given. This is what we will offer in Chapter 3. Firstly, we will criticise the classifications given in extant literature and then propose a new way to do it. According to our classification, the possible solutions to the Problem of Distinction should be divided into two groups: the *positive* solutions and the *negative* solutions. The positive solutions are solutions that assume the distinction of the spheres and try to provide informative metaphysical elements to solve the PoD (i.e. ones which deny that the spheres are absolutely "indiscernible"). The haecceity view that the thesis defends is hence a positive solution. Besides haecceities, the metaphysical elements (most of which are *entities*) used by positive solutions include the following: qualitative properties, spacetime points (e.g. Campbell 1970), tropes (e.g. Maurin 2002), bare particulars (e.g. Moreland 2001), matter (e.g. Aquinas 1968), cause and effect (e.g. Davidson 1969), mereological parts, and relations/structures (e.g. Ladyman and Ross 2007).

By contrast, the negative solutions are solutions that do not share our assumption that the sphere case is a case of *distinction* which cries out for explanation. Instead, they try to eliminate the problem in different ways. Representative negative solutions include primitivism (e.g. Burgess 2012), three identity solutions, the Summing Solution (e.g. Hawley 2009), the Universal Bundle Theory (e.g. Curtis 2014), the Curved Space Hypothesis (e.g. Hacking 1979 though he does not fully endorse such a view), Indeterminism (e.g. Hacking 1979), Verbalism (e.g. Rescher 1955) and Epistemicism (e.g. Pears 1955).

We believe the above classification covers the main possible solutions in the literature. But due to the word limit and other considerations, we will only focus on what we take to be the five most popular solutions: four *positive* solutions (spacetime points, bare particulars, tropes and haecceities) and one *negative* solution (the Universal Bundle Theory). But for each of the other ignored solutions, brief reasons are also given to explain why we will not discuss them in any detail (for example, at the end of Section 3 in Chapter 3(A)).

In Chapter 3(B), after a short discussion of our general methodology, namely Inference to the Best Explanation, we will set up eight related *Principles of Evaluation* for the solutions to the PoD. Each of these eight principles is first clearly stated and justified, followed by some applications. By way of introduction, here is a brief characterisation of each principle:

Definition

[P1] An explanation A of a distinction fact must provide the sufficient and necessary conditions for the distinction fact.

No Conceptual Circularity and Triviality

[P2] An explanation A of a distinction fact should not involve conceptual circularity and familiar triviality.

Non-circular Individuation

[P3] An explanation A of a distinction fact must involve entities from a distinct ontological category.

Reliability of Distinction

[P4] If both fact A and fact B can give an explanation for fact C, where C is a fact of distinction, then ceteris paribus, A is a better explanation than B if the distinction of A and C is less controversial than the distinction of B and C.

Indivisibility

[P5] An explanation A is better than B in solving the PoD if, ceteris paribus, A not only solves the Problem of Distinction, but also solves the Problem of Indivisibility.

Generality

[P6] An explanation A is better than B in solving the PoD if, ceteris paribus, A not only solves the problems in symmetrical cases, but also in the non-symmetrical ones.

No Revenge

[P7] An explanation A is better than B in solving the PoD if, ceteris paribus, A faces fewer revenge problems than B. That is to say, the same form of the PoD should not reapply within the explanation.

Ontological Priority

[P8] An explanation A is better than B in solving the PoD if, ceteris paribus, the entities involved in A are more fundamental.

Equipped with these principles, Chapter 4 explores three positive solutions and argues that none of them can satisfactorily solve the Problem of Distinction. Chapter 4(A) argues against the spacetime/spatial points solution, which says the two spheres are distinct because each of them has a unique spacetime location (Locke 1828, Campbell 1970). The chapter firstly summarizes the main spacetime theories and then argues that (most versions of) the spacetime solution (1) cannot solve the general cases of distinction and face what we call the "Revenge Problem", namely, that the very distinction of spacetime points requires explanation, and may also fail to deliver the right ontological *priority* if spacetime is less fundamental than the substances whose distinction requires explanation,

and (2) is not a necessary condition even for the distinction of two spheres because it seems metaphysically possible that two spheres are co-located.

Chapter 4(B) proceeds to argue against another solution, bare particularism (Moreland 2001, Pickavance 2009). It is said that there are two distinct spherical substances because there are two bare particulars. Despite the fact that bare particularism has many advantages and overcomes some problems facing the spacetime point solution, we argue that it is still unsatisfactory because (1) bare particularism fails to obey the Principle of Non-circular Individuation (i.e. we need to use entities from a distinct category to explain the distinction of substances), since it is widely held that bare particulars are still particulars and the distinction of particulars cannot be explained by further particulars; (2) standard accounts of bare particulars may take them to be dependent upon substances, which means the Principle of Ontological Priority [P8] is also violated; (3) compared with the haecceity view developed in the second half of the thesis, bare particularism has to provide an account for the "bareness" of a "bare particular" so that the notion is not as *obscure* as it seems, and more importantly, according to extant views on bare particulars, nothing in the nature of a bare particular can provide us with the origin of substance *unity*, which makes haecceities preferable once our ontology of haecceities is accepted.

The final positive non-haecceity solution we will consider is trope theory (Maurin 2002, Ehring 2011). Trope theorists would argue that the qualitative indiscernibility of the two spheres is due to there being distinct but similar sets of *tropes*, and the distinction of tropes explains the distinction of the two spheres. However, Chapter 4(C) argues that this solution is flawed in many ways, being neither sufficient nor necessary for the distinction of two substances: (1) It is not necessary because it seems that two substances can share exactly the same tropes. One main reason to resist such trope-sharing is to hold that tropes are *non-transferable*, but the chief argument for the non-transferability of tropes is to say tropes are ontologically *dependent* upon their bearing substances (or even individuated by the substances), but if that is the case, the explanation will again violate the Principle of Ontological Priority because only entities that are more fundamental can explain the substance-distinction. (2) On the other hand, trope theory is not sufficient for the distinction of two substances because the existence of two tropes is compatible with the existence of a single extended simple. Merely saying that there are two sets of tropes cannot tell us that there are two distinct substances rather than *one extended simple*. The chapter then defends the intelligibility of extended simples as shown in McDaniel (2007) and also considers some failed remedies involving the ideas of determinates and determinables, and the distinction between modifier tropes and modular tropes.

After arguing against three positive solutions, the thesis goes on to evaluate one of the representative negative solutions, the Universal Bundle Theory (UBT). One version of UBT holds that the two Blackian spheres are *one* bundle of universals which is *bi-located* because universals are "immanent" and can be multiply located by their nature. Hence it is not the case that we have two indiscernible but distinct substances, rather, all we have is one bundle of universals. In Chapter 5,

after considering one *metametaphysical* worry about most "negative solutions", two standard UBTs, the *Identity-View* (O-Leary Hawthorne 1995, Curtis 2014) and the *Instance-View* (Rodriguez-Pereyra 2004), are compared and it is argued that both are problematic, and we also identify a new version of UBT which is better than those two previous versions. Then the chapter discusses Robert Garcia's (2014) "Non-property challenge" for bundle theories in general. Finally, it is argued that a deeper worry for all UBTs is that the very idea of *immanence* is problematic in many respects, which makes the UBT an unsuccessful solution. This is also the end of the first main part of the thesis.

The second half of the thesis starts by showing how haecceities can help to solve the Problem of Distinction. According to the haecceity view, there are two distinct substances simply because there are two haecceities. Chapter 6 examines the haecceity view against the key Principles of Evaluation we set up and argues that the haecceity view overcomes the major problems facing alternative solutions. Chapter 6(A) outlines five core features of a haecceity: namely, *particularity*, *property*, *simplicity*, *non-qualitativity*, and *essentiality*. (Some of these features are mentioned or implicitly assumed in the literature, but no other complete characterization like ours has yet been offered.) The chapter then argues that the haecceity view is both sufficient and necessary for the distinction of objects; it does not face the problem of using entities from the same category and does not face the Pairing Problem; and it can solve the Problem of Distinction for the general cases as well as the Black-type symmetrical cases.

Chapter 6(B) replies to one of the most popular objections to haecceities in the literature, namely, that using haecceities to individuate an individual is circular because haecceities cannot exist without individuals. This objection has a variety of versions. Some of them have been discussed elsewhere, but a complete summary of them, together with replies from the haecceity theorists, is still missing in the literature. In this chapter, we will consider the *Intelligibility Worry* (Adams 1981), the *Relational Worry* (Markosian 2004), and the *Tracking Problem* (Williamson 2013). A diagnosis about why philosophers may have those worries is also provided. Further, the chapter argues that even if there is some circularity involved in the theory of haecceities, that kind of circularity is not vicious and can be informative.

Chapter 6(C) proceeds to examine whether the haecceity view can be applied to other problems about individuation (namely, the *Problem of Indivisibility*) and whether it can give us the right ontological priority (again, see principle [P8]). As it demonstrates, haecceities can explain why a substance is unified, why it does *not* have *parts which are also substances*, and why substances are non-instantiable. Also, we will argue that substances are dependent upon haecceities, but this is also compatible with the fact that substances are *independent* in the sense proposed by Hoffman and Rosenkrantz (1997) and Merricks (1997).

After showing how haecceities can solve the PoD and other related issues, we go on to develop an ontology of haecceities. The resultant theory is novel in various ways and makes a new contribution to the discussions of haecceities. Inspired by Paul's *property mereology* (2002), in

Chapter 7 we will take a haecceity to be a mereological part of its correspondent substance and a substance to be a mereological sum of a haecceity and *certain* qualitative universals. What universals can form a substance with a given haecceity is determined by the nature of haecceity itself and we introduce the notion of "haecceitification" to describe these special mereological fusions which are substances. Haecceitification can be understood as a metaphysical operation which ties a quality to particular object, and therefore has a lot in common with the notion of instantiation. It makes universals "particularized" into an individual substance. In other words, a substance is a haecceitified mereological fusion of a haecceity and its qualities.

We firstly explain why property mereology is well-motivated and worth pursuing, and clarify some minor differences between Paul's original version of the mereology and our intended system. Next, we extend the standard property mereology by adding three rules (axioms) about haecceities, where these rules are supposed to be both "provable" given the theoretical definition of haecceities and explanatorily powerful when applied to concrete cases.

The first rule says that if S is a substance, then there is *one and only one haecceity* which is S's property part. Although mereological composition itself is still unrestricted in our system because for any parts *x* and *y*, there will be a fusion which has *x* and *y* as parts, the first rule prevents any two substances from composing *a third substance*. This can also be established using the point that a haecceity which is responsible for the individuation of a substance must be *simple* and therefore *cannot* be a "higher-level" haecceity composed by two "lower-level" haecceities. This rule nicely reconciles two apparent conflicting intuitions among philosophers: some philosophers hold that mereological composition is unrestricted and that *any* parts can clearly compose a whole, while others feel that not every entity is equally fundamental: the sum of an apple and a banana cannot be a third, extra *substance* besides the substance apple and the substance banana. After all, it seems the sum of the apple and the banana does not have the kind of *unity* that its parts have. But according to the first rule in our haecceity mereology, the intuition about parthood is compatible with the intuition about substance unity. It does not follow from the fact that there are many mereological fusions that there are the same number of substances.

The second rule says that for all the fusions sharing the same haecceity, one and only one of those fusions is the substance. This well respects the intuition that among all the fusions which take one common haecceity *h* as a part, not all are qualified to be a substance. And one important application of this rule is that it can help us to understand why *tropes* are often taken to be "*junior* substances". Our view is compatible with certain versions of trope theory, but tropes would not be anything fundamental.

The third rule in our system then says that every element or fusion must overlap with at least one substance (*when all the relevant elements exist*). Similar to the Armstrongian *Principle of Instantiation*, this rule effectively precludes cases where both ordinary properties and haecceities exist

without doing anything to generate substances. (But this rule is much weaker than the standard version of the Principle of Instantiation; see immediately below on Chapter 9).

Finally, we point out that although haecceities are ontologically primitive, taking these rules together may give us a kind of functional analysis of the notion of haecceities. To understand what a haecceity is, is partly to understand how it interacts with other entities like universals and substances.

Our haecceity mereology is one of the first ever systems of qualitative universals and haecceities in the literature that provides a rigorous framework in which we can understand a variety of issues. It is innovative in extending Paul's idea of property mereology to haecceities and in making improvements upon it; it also demonstrates how intuitions about ordinary objects can be incorporated in formal principles. None of these can been found in the previous haecceity literature. With the help of these mereological rules concerning haecceities, we are able to select the substances from given fusions. For instance, if there are two haecceities h_1 and h_2 and two qualities q_1 and q_2, and suppose the two qualities are enough to form any substances with h_1 or h_2, then among the 11 mereological fusions, only *two* of them would be substances according to our mereological system. But which two? Here we come to a limitation of our ontology: it seems that the mereological principles alone cannot determine whether our world is an h_1q_1-h_2q_2 world or an h_1q_2-h_2q_1 world. More vividly, we may think the person Tom is partly a fusion of Tom's haecceity and the quality *being rational*, and that an electron, Mary, is partly a fusion of Mary's haecceity and the quality *being negatively charged*. But as far as our mereological rules are concerned, nothing can rule out the epistemic possibility of the haecceity of Tom forming a substance with the quality *being negatively charged*. Thus, more needs to be added to our theory to account for how our general intuitions about ordinary objects are formed and how knowledge about substances is possible.

This is the challenge of *substance scepticism* which will be addressed in Chapter 8. It will be argued that our intuitions about ordinary objects can be explained by various non-ontological and practical considerations, and following Lewis (2009), Langton (2004), and Schaffer (2005), it is suggested that the right attitude we should have towards substances is some kind of Kantian *Humility*. We can have a lot of knowledge about substances in certain contexts but this knowledge is by no means *infallible*.

Chapter 9 argues that in spite of the fallibility of our knowledge about substances, the special mereological relationship between a haecceity and its qualities which generates a substance, *haecceitification*, is *metaphysically necessary*. It is not merely necessary in the sense that two mereological parts cannot fail to compose a whole, rather, it is necessary because a haecceity is supposed to be the *origin of unity* for its substance, and haecceitification is not some extra relation *besides* a haecceity. Instead, it is *internal* to the essence of a haecceity that it can haecceitify certain qualities rather than others. This is also motivated by the worry of a vicious *Bradley's regress*: if a haecceity alone cannot guarantee haecceitification (assuming qualities are abundant), then something else would be required to play the unification role for substances, but then that extra mechanism

would face a similar problem about unity, and something further would have to be introduced… *ad infinitum*. We go on to explain in what sense our ontology of haecceities might allow the existence of nonhaecceitifying haecceities (namely, in cases where the required properties are not abundant enough. But note that on the condition that all relevant properties are sufficiently abundant, a haecceity cannot fail to do its haecceitification work). Also in this part of Chapter 9, we consider some alternative and weaker ways of characterising the modal relationship between haecceities and qualities: Maurin's (2011) semi-external relation and Armstrong's (1983) natural necessitation. However, it is argued that neither of them can be applied to the *ontology of haecceities* (even if merely adding the notion of a haecceity to other ontological pictures in isolation might be relatively easy to do).

One consequence of the claim that haecceitification is an internal, metaphysically necessary relationship is that if we have a substance apple, Mary, which is red at a time, then the haecceity of Mary (Maryness) must haecceitify redness necessarily, meaning it is not possible for Maryness to haecceitify greenness. But intuitions may suggest that, on the contrary, a red apple could have been green. Thus, our task here is to explain these modal intuitions away. The theory we will offer in Section 3 of Chapter 9 is that these intuitions about contingencies are in fact *modal illusions* (Kripke 1980, Chalmers 1996), and in conceiving a possible case where Mary is green instead of red we are conceiving something *other than* the actual Mary. We end our discussion by analysing the two Blackian spheres in the light of our haecceity ontology.

The last chapter, Chapter 10, summarises the main conclusions of the thesis.

Issues not covered and future work

The above sets out in rough terms what we are going to say in the thesis. But there are a number of interesting issues we have to put aside, and more positions (for instance, *structuralism*; see Chapter 3(A) for a comment on it) could have been included and evaluated. And although we have tried to be fair with our opponents and evaluate their positions to the best of our knowledge, it is impossible to cover every possible reply. Accordingly, our aim is to not to prove that all the other metaphysical positions we criticize should be completely abandoned, rather, we hope to demonstrate that there is a well-motivated but neglected ontology of haecceities which may overcome some problems. That is to say, the haecceity theory is better than the alternative ontologies from the perspective of the Problem of Distinction (and other related problems), but there may be other good reasons for accepting the rival theories for those who do not take the Problem of Distinction as seriously as we do.

Another issue we have not covered in the thesis concerns the individuation of properties (universals), and we assume the Problem of Distinction is mainly about the distinction and identity of *substances* only. (At the moment, for instance, we are neutral about whether a bi-located universal redness and a singularly-located universal redness are the same universal or not.) Also, we are not able to consider the identity and distinction of other non-standard but interesting entities in other

categories like processes and events, though it also might be the case that our ontology of haecceities (and universals) has provided all we need to account for the distinctness of these other entities. Nor are we able to consider other rich interpretations of haecceities in the history of philosophy (including other intimately related notions like *common nature*, *contraction* and *formal distinction*: see Engel 1998, Cross 1999 and Surzyn 2013), and in other philosophical traditions (see Pierce 1868, Heidegger 1916, Husserl 1970, Deleuze and Guattari 1987, Van Buren 1994, Mugnai 2001, Bogue 2010, De Monticelli 2014, Escudero 2016).

A final significant point which we save for future research is that the idea of haecceities and their ontology has considerable potential for illuminating other philosophical problems. It can be applied to many areas and may shed light upon many questions, ranging from formal logic to the sciences. For instance, the notion of haecceities may help us to rethink the orthodoxy of first-order logic with identity (Peacock and Tedder 2016); it can also play a crucial role in debates on quantum mechanics (Teller 1998); in the philosophy of time, some presentists have used haecceities as truthmakers for statements about the past and future (Keller 2004); in the philosophy of religion, haecceities have been appealed to as a way of understanding the Trinity (Davis 2002). And, arguably, haecceities even reveal something deep about our consciousness and personal identity (Baker 2013): the way we grasp our self-awareness and think about ourselves self-referentially is structurally similar to the way one sphere is individuated by its haecceity. And if haecceities are entities which are beyond the scope of empirical observation, this shows that the pure empiricist description of our world would be *incomplete*, and this can naturally be developed as an argument for panpsychism (Goff 2017). Whether these benefits are genuine must be left for future work. At any rate, in the first place an ontology of haecceities is required to make these applications possible. This is the picture that is going to unfold in the following chapters.

PART I

THE PROBLEM OF DISTINCTION &

NON-HAECCEITY SOLUTIONS

Chapter 2
What is the Problem of Distinction?

The Problem of Distinction, roughly, is to "explain the distinction of one substance from another" (Cross 2014, Introduction). But it is not clear whether all cases of substance-distinction are on a par, and further clarification of the problem is therefore needed. After setting out the standard view in the literature (Section 1), this chapter firstly argues that the Problem of Distinction should be distinguished from the problem of *which is which* or, as we will term it, the Pairing Problem (Section 2). Secondly, and relatedly, even for the most "salient" and ordinary cases of substance-distinction, their substance-distinction cannot be fully and satisfactorily explained by their property-distinction (Section 3). Hence we will conclude that the Problem of Distinction should not be limited to canonical cases of "symmetrically" arranged entities; rather, it is a more *general* problem for *any* individual substances (Section 4).[2]

1.   The standard view: some cases are special

Consider a range of different distinction-pairs: the number 2 and London; a cat and a dog; Socrates and Plato; two electrons. For each pair, we could ask: why are there two distinct entities rather than one? However, as far as the Problem of Distinction is concerned, the prior question is: should all these cases be treated *equally*? In the literature, the answer seems to be: No. Not all cases are *equally* important, and most philosophers only study some of them. On the one hand, most may find the distinction between the number 2 and London to be obvious, and not to stand in need of explanation; on the other hand, many (e.g. French 1989, Muller 2015) have made serious efforts to explain the distinction between the two electrons. The problem is not limited to physical entities. The distinction of mathematical entities such as i and $-i$ is also frequently discussed (e.g. Shapiro 1997, Nodelman and Zalta 2014).

If such an observation is accepted, then for convenience of discussion we may find a way to distinguish those cases: we will use the term *Special Cases* to refer to the cases which are most frequently studied, like electrons, symmetrical complex numbers or Blackian spheres, because these cases usually concern entities of the same kind, and intuitively speaking are "symmetrically" arranged; and other cases, which most authors consider to be trivial and whose entities are not of the same kind, we will call the *General Cases*; these would be cases like a cat and a dog, an apple and a banana, or London and the number 2. The general/special distinction may be a matter of degree and have some borderline cases, but the phenomenon it tries to characterize is clear: as we have already

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[2] As mentioned in the Introduction, Scotus holds that the Problem of Individuation has two aspects, the Problem of Distinction and the Problem of Indivisibility. Our strategy will be to focus mainly on the Problem of Distinction, and take the Problem of Indivisibility to be something supplementary for evaluating various solutions.

observed, a common shared assumption implicit in the literature seems to be that only *some* cases of the Problem of Distinction are worth investigating. Recall Moreland (1998)'s characterization of the Problem of Distinction (Individuation):

> Suppose we have two red, round spots that share all their pure properties in common. Let us call them Aristotle and Plato. The problem of individuation is the problem of offering an ontological assay of the situation so as to specify what it is that makes the two spots two particular, individual entities instead of one. (p. 251)

We agree that the Problem of Distinction is that of specifying what it is that makes two particular, individual entities "two instead of one". But Moreland's characterization of "two particular, individual entities" is restricted: it only addresses the case where two spots *share all their pure properties*. Like many other formulations, it assumes that the special cases of Distinction are the only interesting cases. In other words, the Problem of Distinction can be raised non-trivially only when applied to special pairs of entities (usually entities of the same kind). When the problem is applied to general cases, where the involved entities are radically different, it is too easily explicable to be a genuine problem.

But *why* treat the special cases and the general cases differently? What makes the special cases, such as explaining the distinction between two electrons or two spheres, so *special*? What justifies the different treatments? Thinking about this issue helps us to clarify the nature of the Problem of Distinction.

The rest of this chapter argues *against* such a differential treatment, maintaining that all cases, special or not, are *equally* important as far as the Problem of Distinction is concerned. Since few people have articulated this issue, to be fair to our possible opponent, we speculatively suggest that what lies behind their intuition of differential treatment could be these two following stories:

1. For the Problem of Distinction, the special cases are more difficult than the general cases because only in the general cases can we ask *which entity is which*, while in the special cases matters as to which entity is which cannot be even raised.

2. For the Problem of Distinction, the special cases are more difficult than the general ones because only in the general cases can we appeal to (qualitative) *properties* to *explain the distinction*, while in the special cases no properties can be appealed to in the explanation.

We will explain and evaluate each of these stories in the following two sections respectively. Ultimately, as we will see, neither is plausible, and hence a different treatment for various distinction-pairs is unwarranted. We begin with the first story.

2. The Problem of Distinction is not the Pairing Problem

2.1 The Pairing Problem

We have seen that many philosophers take the special cases to be the only interesting cases for the Problem of Distinction while the general cases are not. According to one possible story, the reason for treating the special cases and the general cases differently is the following: for pairs like London and the number 2, for instance, we know "which is which": the number 2 is the one of the pair which is prime, and London is the one which is a city (or the one which is not prime). But in the case of electrons, as many have put it, we *in principle* cannot tell "which is which". (Note that by asking which is which, we are not only asking *epistemic* questions: how do we know which is which?[3] By contrast, what we care about is, metaphysically, which is London, and which is number 2?)

We suggest that a clearer way to understand the question "which is which?" is in terms of the Pairing Problem:[4] we are given some properties and some substances, and asked what distinguishes one substance from the other; and then the answer is to *pair* a certain property *with* a certain substance. In the case of the number 2 and London, we *group* the properties and substances *into two pairs*: one is the pair of being prime and the number 2; the other is the pair of being a city and London. Thus, we can respond to the problem of distinguishing the number 2 from London by employing these *pairing operations*.[5] In other words, an answer to the question of which is London, in our context, is a pairing operation between London and one property, being a city; similarly, an answer to which is the number 2 is a pairing operation between the number 2 and the property of being prime. Thus understood, the Pairing Problem (namely, the Problem of Which is Which) is a question of making pairs from a given domain (like {2, London, being prime, being a city}).

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[3] For instance, we may distinguish an apple from a banana by pointing to them, and saying that *this* is the apple and *that* is the banana. Unfortunately, besides the controversial Quineian indeterminacy of reference, even from an epistemic point of view, distinguishing things by pointing cannot serve the purpose. On one hand, if an apple and a banana are identical, then we cannot have two different "pointings"; on the other hand, if an apple and a banana are distinct but indiscernible—by, for instance, sharing a single distributional property (they *seem* to be discernible *for us*, but only because we fail to recognize the larger property they share)—then when the apple is pointed at, so is the banana.

[4] The term is borrowed from the debate within mental causation on the relationship of bodies and minds (for instance, see Sosa 1984 and Kim 2005). It is sometime posed as asking how a nonphysical mind can be accurately paired up with its own body rather than others. However, in our current discussion the term "pairing" is used in a more general and methodological way. Interestingly, Saad (2017) argues that the pairing problem does not exist because of a dilemma when haecceities are taken into consideration. However, we will not talk about his view because his definition of "pairing" is too narrow to be useful here and quite irrelevant to our concern. He only discusses *causal* and *non-casual* differences of souls.

[5] The viability of the operation does not require that all the elements can be *completely paired*. For instance, if there *is no property* like *being a city* for London, then saying that being prime can be paired with number 2, rather than London, is sufficient to distinguish 2 from London, even if in that sense London itself is not a *complete pair*. But for ease of discussion, we assume each substance can be completely paired.

2.2 The Problem of Distinction is not the Pairing Problem

However, things are not that straightforward; for now we are going to argue that the Problem of Distinction is not the Pairing Problem. *Even if* the special cases and the general cases can be differently treated as far as the Pairing Problem is concerned[6], it does not follow that these cases are different for the Problem of Distinction. This is because the Problem of Distinction and the Pairing Problem are two different problems.

Why is this so? The answer is that we could still explain the distinction of things even if there is nothing to be paired. For instance, as we said, the Pairing Problem is the problem of making pairs *from a given domain*. If we define the domain as a set of four entities, {London, being prime, being a city, and 2}, then, *after* we correctly group the elements into two pairs {London, being a city} and {2, being prime}, we cannot legitimately ask again "which pair is which", because nothing left can be used to pair with those given pairs. In our toy model, the four elements are *all the material we have* in reality making. But we may still try to explain why the two pairs are distinct,[7] or, more accurately, *why are there two pairs, rather than one*? These two pairs' distinction can still be investigated *after* the pairing operation (if there is one available at all). Arguably, the pairing operation does not solve the Problem of Distinction, rather, it at most pushes the problem back a level. Thus, the Problem of Distinction (for general or special cases)—namely, explaining the distinction of two entities—is not equal to the Pairing Problem (namely, the Problem of Which is Which). The former asks only what makes two things two, rather than one.

This point can be demonstrated with general cases like London and the number 2, but it can also be seen from very special cases. It is a well known scientific fact that for two entangled electrons, asking which is which makes no (at least *physical*) sense (e.g. French and Krause 2006). In our terms, it means the two electrons do not have any physically observable properties which can be used to form *a distinct pair* with one electron rather than another. It is not the case that one electron e_1 can be paired with one unique property F, and another electron e_2 can be paired with another property G, so that we can have distinct two pairs {e_1, F} and {e_2, G}. However, *statistically* speaking these electrons are still *countable* as two rather than one. Explaining their *countability* is a fully intelligible question which is independent from whether there are properties available for pairing.[8] It may even be correct

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[6] However, there is another question on whether our pairing operation reflects the "real" structure of the world, see below and Chapter 8.

[7] If each pair can be taken to be a substance at all.

[8] Note that here we assume electrons are objects and can have individualities. Also note that science only helps us to know the given fact that there are two electrons via *statistics*, but statistics does not explain why that is so: it does not provide metaphysical grounds for the distinctness of electrons. For instance, it is right to say that if each electron's mass is m and the whole mass of the system is $2m$, then there must be two electrons. But the *mere existence* of a mass of $2m$ is not a metaphysical guarantee for the distinction. How could the mere property of "being of mass $2m$" be sufficient for us to say there are distinct objects? It could not. After all, many other things can have mass $2m$ as well. Of course, if we *define* things such that an object must have the property of being of mass m as its essence, then having a mass of $2m$ will be a trivial explanation for the presence of two objects. I suppose few would find that such a truth *by definition* plausible.

to say that the pairing operation for electrons is in principle *impossible*. But that only expresses a view about the Pairing Problem.

The Problem of Distinction is different. On one hand, there might be no matter of fact as to which is which, and pairing cannot be reasonably demanded in the first place, as shown in the electrons case; on the other hand, when the pairing elements (i.e. various properties) are not *abundant* enough, the Pairing Problem cannot exist because no method of pairing can be carried out, as shown in the case of London and the number 2: *after* all the elements in a model are used up for pairing, *nothing* else will be left. But for either case, there is *always* a correspondent Problem of Distinction: not every case where the Problem of Distinction can be raised is a case where the Pairing Problem can be raised.

The idea applies not only to general cases and special cases in natural sciences, but also to special cases which are purely metaphysical. For instance, as far as the Problem of Distinction is concerned, the problem of explaining the distinction of the two Blackian spheres (which will be explained more in detail in later chapters) is essentially the same as the problem of the two electrons. Even if a scientific strategy comes to light that enables us to sensibly say which electron is which, the Problem of Distinction will still be there.

If the Problem of Distinction and the Pairing Problem are not the same, then the above reason for treating the special cases and the general cases differently is not tenable: it only works for the Pairing Problem, rather than the Problem of Distinction. This point will be essential in later chapters when we defend the solution with haecceities.

3.   Property-distinction does not help

3.1   How property-distinction is *supposed* to work

Now let us move on to the other possible reason for upholding the different treatments, which will be ultimately rejected. Some might argue that the "special cases" like two electrons or two similar spheres are to be specially treated because these cases do not have certain kinds of *property-distinction* to ground their distinction. By contrast, it is said that for most general cases, some property-distinction is always available to explain the distinction of the entities involved (even if it cannot be used to solve the Pairing Problem): when asked about what makes the number 2 distinct from London, we could easily conclude that *they are two entities* from the fact that some properties are *only instantiated by one* of them: for instance, the fact that not both entities have the property of being prime seems enough for us to justifiably say that there are at least two entities, of which one is prime and the other is not, hence they are distinct. (Note again that saying London and the number 2 are distinct is one thing; finding out a way to *determine which is which* is quite another. See below.)

In contrast, when asked what makes two electrons two distinct electrons, we may be at a loss for an answer because no property-distinction could be (empirically) appealed to for these highly

similar things. In other words, property-distinction is sufficient but not necessary to explain the distinction of any two substances, because there are special cases like two electrons or two symmetric spheres where no property-distinction can be found. (In fact, even some of the authors who believe in haecceities share this assumption in justifying haecceities.) Hence, we need to treat the special cases and the general cases differently.

This story we are discussing now is different from the story of *pairing* we defined in section 2, though it may seem that properties could *also* be used to solve the Pairing Problem as well. Theorists who adopt this story (namely, that only in general cases can we find some property-distinction) can accept that the Problem of Distinction is not a Pairing Problem (namely, the problem of which is which). They do *not* need to say that for all the general cases, we can use properties to answer the question which entity is which. This is because in using properties to ground object-distinctions, only *existential quantification* over objects is required. These objects do not have to be directly referred to by distinct *names*. If *there are two objects*, one is F, and the other is not, then these objects are distinct. (When we say, for any two substances *x* and *y*, if there is a proper property-distinction between them, then they are distinct, "*x*" and "*y*" are merely arbitrary labels. Of course, they can have proper names, but the point is just that the Problem of Distinction is neutral on this requirement.[9] By contrast, it is arguable that the Pairing Problem does need refer to things by proper names.) Rather, all they need to say is, for the general cases, a fact about their property-distinction can be used to ground the object-distinction.

To further appreciate what we have said, consider an analogy. To evaluate whether some given explanation is *sufficient* for the distinction of certain objects (and a solution to the Problem of Distinction must be at least sufficient), we are like detectives who need to estimate the number of criminals at the scene based on a lot of evidence. For some detectives, for instance, a presence of *two hats* of different styles can be a good piece of evidence which allows us to conclude that there must be at least *two distinct criminals*, because usually as a rule of experience, a person can wear at most one hat at a time. Of course, whether such a rule is reliable is open to debate: other detectives might be sceptical, pointing to cases where (say) a criminal has enjoyed wearing many hats at a time, and so they will consider other pieces of evidence more seriously, like there being two different ID cards, blood types, or two different DNA sequences, because the chance of one person having two different DNA sequences or two blood types is extremely low. But *even if* the mere existence of two hats can guarantee the number of the criminals is two, it will tell us nothing about which hat is owned by *whom*.

Here, finding reliable things from which the number of criminals (their distinction or identity) can be inferred is in some sense like answering the Problem of Distinction, while *further* identifying *which hat belongs to whom* is to find an answer to the Pairing Problem. Hence, an inference from

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[9] As some might say, things can be discernible *de re* without being discernible *de dicto*.

property-distinction to substance-distinction is one thing, while determining which substance has which property is quite another. The reason, that we now discuss, for treating various cases of distinction differently concerns the former, rather than the latter.

We have outlined the core idea of using property-distinction to solve the Problem of Distinction in general cases. And since this strategy cannot be applied to cases where no property-distinction could be found (like two electrons or two Blackian spheres), it seems we have a good reason to treat the special cases differently from the general cases.

However, now we argue that for the general cases, appealing to property-distinction is far from a satisfactory explanation. If our arguments are sound, then it would seem there is *nothing genuinely special* about the special cases and so, again, all cases should be treated equally as far as the Problem of Distinction is concerned.

3.2   Two types of property-distinction

The putative property-distinction which can be used to ground the distinction of objects in general cases involves two types. One type of property-distinction is with negation:

> X and Y are distinct because one of them has a property and the other does *not* have that property

The other type does not have negation explicitly, but involves two properties which are claimed to be "incompatible":

> X and Y are distinct because *two incompatible properties* are instantiated by them

Let us begin with the first type. It seems not very useful in solving the Problem of Distinction because it is circular. Only when we assume X and Y are distinct substances can we say one of them does *not* have a property. Saying a property is had by X rather than Y presupposes, rather than grounds or explains, the distinction of X and Y. Of course, if the banana is yellow and the apple is *not* yellow, then we should say the apple and the banana are distinct; but what metaphysical grounds prevent the apple from being yellow as well, if by "the apple" what we refer to turns out to be *a single scattered substance* which is yellow over here and not yellow over there? In other words, the fact that there is a patch of yellow here and of not-yellow over there does not entail that there are two substances. It seems that unless we assume the apple is not the banana in the first place, we cannot use the fact that the apple is not yellow to explain the distinction of the apple and the banana.[10] In this context,

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[10] Another complicated issue worth mentioning is that some philosophers argue that "negative properties" should be seriously doubted (e.g. Zangwill 2011, Baron, Copley-Coltheart, Majeed and Miller 2013). A negative property is hard to ascertain and it also seems we do not rely on negation very much either in epistemology or in practice. We may (mistakenly or not) perceive the apple as red, but it does not follow from this that *not being yellow* is being perceived. In the case of a red apple and a yellow banana, we should say strictly speaking that as far as the colour is concerned, what we perceive is just a shade of red on one side and a shade of yellow on the other side, full stop. Negation can be eliminated in reality by careful description, and it might be argued that "a is not F" should only mean that "a is F" is false in virtue of lacking a truthmaker (e.g.

concluding there are two substances because only some places are yellow and others are not is question-begging.

It seems a more popular way is to adopt the second type of property-distinction: on this approach, the apple and the banana are distinct because one is red and the other is yellow, and *the yellowness and the redness are "incompatible"*. This type of explanation is more complicated than the first. Let us have a closer look in the following sections.

3.3   The problems of using property-distinction to explain substance-distinction

The story we are evaluating now is: the existence of two incompatible properties is sufficient for the distinction of substances. For example, if we have one red apple on the left and one yellow banana on the right, then we can infer that a red apple and a yellow banana are two substances merely from the fact that being red and being yellow[11] are incompatible. In doing so, at least two assumptions are made:

(1)   In the case with a red apple and a yellow banana, there are two *distinct* properties, being red and being yellow.

(2)   If being red and being yellow are two distinct properties, then they are in some sense *incompatible*. And this fact can metaphysically *explain* the red apple and the yellow banana's distinction.

But after careful reflection, both assumptions can seem seriously doubtful. In section 3.3.1 I will argue that merely seeing a red area on the left and a yellow area on the right does not guarantee that there are two properties. Rather, it might be the case that there is only one distributional property; in section 3.3.2 I will argue that using the incompatibility of two properties to explain the distinction of substances is circular.

3.3.1   *Are there really two distinct properties?*

Let us first consider whether from the fact that a red apple and a yellow banana exist we can confidently conclude that there are two distinct properties. It does not seem so, because, for instance, when having a red apple *on the left* and a yellow banana *on the right*, although from experience it is natural to say there are two substances having two distinct properties, it is also possible to regard what we see as a single distributional property like *being-red-on-the-left-and-being-yellow-on-the-right* (call this distributional property 'rellow').

Believing in this single distributional property can explain everything we need in experience (e.g. Parsons 2004, Cameron 2011). Both the apple and the banana have this property, and the apple

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Mumford 2007*a*). The worry here is not only that negation may play no fundamental role in reality or perception, but also that negation cannot help us to explain the distinction of substances non-circularly (see below).

[11] Assuming they are fine-grained enough as determinates. If they are not, we may choose another example.

being on the left, according to the *meaning* of the predicate "rellow", turns out to be red; similarly, the banana being on the right, in a similar fashion, turns out to be yellow. The fact that the apple and the banana are spatially scattered cannot prevent them from having a single distributional property.

If we find the idea of treating the apple and the banana as sharing one single distributional property like being rellow a bit counter-intuitive, consider a similar but more illuminating example, a sphere which is red on the left half and yellow on the right half. It is tempting to say the two parts have two *incompatible* properties, but again we could also say that there is one sphere which has a single property, being rellow. After all, in this case, we are more inclined to say "it is a *colourful* sphere", instead of "there are two pure-coloured half-spheres". Should we say there are two properties or one in this context? Saying the latter does not seem unacceptable. As Hawley (2006, p. 301) writes,

> Leibniz's Law is a fine principle, but the problem is how to recognise instances of incompatible properties. In the present context, how can we tell whether we have a simple system with a mereologically-irreducible property, or a complex system whose proper parts have incompatible properties?

So, if we cannot find a good way to "recognise instances of incompatible properties", property-distinction may be of no use in grounding substance-distinction. For Hawley, it is hard to make a choice between a simple system with a big property (namely, *substance monism and property monism*), and two parts with two properties (namely, *substance pluralism and property pluralism*). Both descriptions are legitimate as far as their empirical outputs are concerned. Both respect the initial data we give in the thought experiment. Their difference seems to be purely theoretical, because both can be said to be an analysis of the fact that "there is a sphere whose left-half is red and whose right-half is yellow". This does not have to mean that these theories themselves are equal and both correct, but the worry is that which theory is correct cannot be decided easily based on their explanatory power with respect to our experience of reality.

The empirical equivalence of these two theories can be seen from another angle: it seems *there is no non-circular and non-regressive way* to directly establish the distinction of being red and being yellow (except some people's pre-theoretical intuition). If we hope to establish that being red and being yellow are the real choice we should have, then we had better give an explanation of the distinction of these two *properties*; however, this is hard to achieve because it seems we will have either to use their *higher-order* properties, with the danger of vicious regress, or make use of their different *bearers* to ground their distinction, which looks circular.

If we use higher-order properties, and say being red is different from being yellow because the properties of being red and being yellow have different physical properties and dispositions to reflect lights, then we cannot help but ask what makes those physical properties distinct. If further

higher-order properties have to be invoked, then it seems the explanation has no end, which makes the regress vicious.[12]

Might it be false to explain the distinction of properties by using other properties because properties are *dependent* upon their bearers, the substances? For instance, it might be said that being red is different from being yellow because the former is a property *of the apple*, and the latter is a property *of the banana*. However, if that is the case, then the distinction of the two substances, the apple and the banana (if they are substances at all), cannot be explained by their property-distinction in the first place.

Perhaps there are other reasons in favour of believing there are two properties rather than one single distributional property. One concern might be from naturalness (for instance, see Lewis 1983). The world may be already carved up into red and yellow entities. It might be argued that being "rellow" is not as natural as red and yellow. That is to say, the property being red and being yellow do better in carving nature at the joints than being *rellow* or being *yed*. And red things are more *objectively similar* than rellow things. Moreover, being red and being yellow are said to be more suitable for scientific laws and causality.

But these considerations' relevance in our metaphysical debate is controversial. Constructivists, pluralists, and anti-realist metaphysicians (for instance Van Fraassen 1980, Putnam 1985) are all sceptical of objective "joint carving", and according to them how we divide the world up is largely determined by our subjective theoretical interests[13]. On one hand, there are not many independent arguments to directly *support* the belief that the world has been carved up already. We are not saying that objective joint carving is false, rather, our point is modest; it only tries to show that there is a lot to do to establish the notion of naturalness. The general idea based on incompatibility is hostage to the fortunes of these other debates.

Relatedly, another concern is with theoretical virtues. It might be said that believing in the existence of redness rather than rellowness is more in line with common sense. But in terms of parsimony, in our context, being one "inseparable" rellow seems to be better. Anthropology studies have suggested *our* common sense "can be questioned, disputed […] even taught, and it can vary dramatically from one people to the next." (Geertz 1983, p. 76, see also Barley 1983.) It is hard to

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[12] A similar line of reasoning can be found in Mumford (2007*b*, p. 57). As we have mentioned in the Introduction, the thesis will mainly focus on the distinction of substances rather than properties, the point here is to show if we use (qualitative) properties to explain the distinction of substances, we will have to address the problem about properties. By contrast, if haecceities are accepted, then whether properties' distinction can be explained does not matter at all for the distinction of substances.

[13] But it is worth noting that saying the joint carving is not *objective* does not follow that joint carving itself is totally arbitrary and cannot be systematic. To the opposite, we may have different criteria to judge whether a joint carving project is good. Likewise, there may be different ontological category systems and it is hard to say which is *the correct* one (cf. Westerhoff 2005), but once a system has been selected and *within each system*, certain rules must be set out to do interesting works.

make a quick decision here. At any rate, the upshot is to show that certain properties may not be *as distinct as they first look.*

If being rellow can be regarded as a legitimate property, then it would be too quick to conclude that there are two (colour) properties merely from the fact that there is a red apple and a yellow banana. If the existence of the two properties cannot be easily established, then there would be no property-distinction in the first place, hence it would not be plausible to say that the general cases of distinction are different from the special cases of distinction because only in the former can we find clear property-distinctions.

3.3.2. Using incompatibility to explain distinction is circular

We have rejected the first assumption of the property-distinction strategy for justifying the differential treatment of various cases of distinction. As we saw, whether property-distinction exists or not is not easy to establish. Now we are going to argue against the second assumption about incompatibility.

To begin with, it should be noted that, even if we grant that two properties are clearly distinct, *and* their distinction can be explained, then their obtaining is still not *sufficient* to explain the distinction between two substances. To say that they are not sufficient, we mean it seems possible to have one substance with those distinct properties. Recall the sphere which is red on its left half and yellow on its right half. But now, it might be said that the two halves are distinct rather than identical because a pair of *incompatible* properties, being red and being yellow, are instantiated. The property-distinction of being red and being yellow is enough to conclude that their bearers are distinct because the two properties are not merely distinct, *but also incompatible*.

However, our worry concerns the very notion of "incompatibility". To start with, such a notion is widely used in metaphysics but it is hard to give it a clear definition. Most people know what it means to say two *propositions* are in contradiction, but what does it mean to extend it to properties? Traditionally, two propositions are in contradiction if they cannot be *both true or both false* at the same time. But two properties are simply two properties. What would it mean to say a property can be true or false? Here there is a danger of making category mistakes.

Some philosophers (for instance, Van Inwagen 2014) might try to say that, although a property is not true or false *simpliciter*, it can be true or false *of some bearers*. But in this context, it seems "being true of a bearer" turns out to be the familiar notion of property-instantiation ("having"). For instance, it is natural enough to say that two incompatible properties are properties which *cannot be instantiated by only one substance* at a time (they cannot be *truly applied to characterize* the same substance), but the problem is that what we get from doing so is simply a definition, rather than an explanation. The properties are *defined* as "incompatible" just because they are never found within one substance, or at least this is how we understand that term. But this means that in using incompatible properties to ground the substance-distinction, the line of reasoning is viciously *circular*: it is said that being red and being yellow are sufficient for the distinction of certain

substances *because* they are incompatible properties. But why are these two properties incompatible? *Because* they must be had by distinct substances![14] [15]

Thus, similar to the case in section 3.1, saying two properties are incompatible, again, presupposes rather than explains the distinction of their bearers. Assumption (2) should therefore be rejected.[16] The incompatibility of properties cannot satisfactorily explain the distinction of some substances, even for the general cases. Treating the general cases and the special cases differently on the grounds of whether incompatibility of properties can be appealed to, is problematic.

Dealing with cases like two electrons and cases like an apple and a banana in different ways would be unreasonable, at least as far as the Problem of Distinction is concerned. On the contrary, ideally a solution to the Problem of Distinction in the "special" cases would also be a solution for all cases. If (as we will argue in later chapters) haecceities are needed for explaining the distinction of Max Black's two spherical substances, they would also be needed to explain the distinction of an apple and a banana (if they are substances). Treating the general distinct pairs and the special pairs equally will strengthen our intended ontology of haecceities.

4.   Conclusion

The Problem of Distinction asks why two substances are two rather than one. We have argued that, firstly, this problem is not the same as the Pairing Problem; and, secondly, the problem should not be limited to cases like electrons and Blackian spheres, rather, it is a more general problem because the common strategy to ground the distinction of general cases via mere properties is not satisfactory. On one hand, whether there are distinct properties or not is hard to decide; on the other hand, appealing to the notion of incompatibility is viciously circular.

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[14] Again, if it is replied that being incompatible just "means" the distinction of substances, then we are barred from providing an explanation which refers to the properties.

[15] Another popular way to cash out the notion of compatibility in our context is to use the determinate/determinable relation (Johnson 1921): two determinates in the same determinable scale are usually not compatible. But the determinate/determinable relation is notoriously hard to define (Korner and Searle 1959). See Chapter 4 (C) against tropes for more detail.

[16] Assumption (2) has two clauses and what this section argues for is a rejection of the second clause. But it is also possible to reject the first clause by arguing that being red and being yellow are not incompatible after all, since a strong case can be made for saying that the existence of being red and being yellow is compatible with the existence of only one substance. For instance, it might be argued that one substance is an extended mereological simple with two properties; or it might be argued that one substance instantiates a single structural property, and this single structural property has being red and being yellow as its two constituents. Due to space limitations, we will not engage overly much with these various approaches. It suffices to say that assumption (2) can be rejected on multiple grounds. Even if our conclusion that even two incompatible properties cannot guarantee the distinction of substances is false, a weaker conclusion would still be plausible: namely, the ordinary explanation of substance-distinction is always insufficient unless their incompatibility could be demonstrated independently.

The Problem of Distinction applies equally to the special cases and the general cases. If the general cases are not interesting, then the same goes for the special cases. Thus, we can combine them into one Problem of Distinction:

For any two substances *x* and *y*, what makes *x* and *y* two distinct substances rather than one?

In an attempt to address this problem, the next chapter will start by giving an overview of the extant solutions to the Problem of Distinction and set up some principles of evaluation.

Chapter 3 (A)
A Classification of Solutions and Principles of Evaluation

We have argued that the Problem of Distinction should be distinguished from the Pairing Problem, and that both the special and the general cases should be taken into consideration. A solution to the Problem of Distinction would seek to identify the relevant entities which can explain the fact that given substances are distinct.

This chapter has two aims: (a) To give a classification of the solutions to the Problem of Distinction which is improves upon the extant classifications. (b) To set up some principles of evaluation regarding those solutions. For ease of reading, we divide this chapter into two main parts. The present part, chapter 3(A), deals with the issue of classification; chapter 3(B) sets up the principles of evaluation.

In this first main part, we firstly clarify some methodological issues (Section 1). We then outline the classification given in literature (Section 2), and subsequently offer an improved classification which we propose to adopt for later discussions (Section 3). An interim conclusion is then given (Section 4).

1.   Some preliminary notes on the method

As we argued in the last chapter, some philosophers treat the special cases and the general cases differently, but this is misleading. If both the special cases and the general cases are worth considering, then there will be three kinds of solutions:

   A) Solutions for the special cases (like electrons and Blackian spheres) only
   B) Solutions for the general cases (like an apple and a banana) only
   C) Solutions for *both* the special and general cases

Now, for convenience of discussion and engagement of literature, our strategy has to make a detour: we will mainly *focus on the special cases* because this is the implicit position for most philosophers in this area. However, the general cases will not be ignored, and will indeed figure in the principles of evaluation we are going set out in Chapter 3(B). So, the solutions which will be classified are mainly based on the special cases. According to the above classification, a solution for the special cases will be either of kind A or C. As I will show, one of the principles we will need is that a solution for the special cases will be better than others if it can also deal with the general cases. So, we begin by discussing (most of) the solutions which are intended for the special cases, and then will evaluate these solutions to see which ones can deal with both the special and the general cases.

A second question we must respond to is: which special case will we focus on? A classical case is Black's two spheres.[17]

> Isn't it logically possible that the universe should have contained nothing but two exactly similar spheres? We might suppose that each was made of chemically pure iron, had a diameter of one mile, that they had the same temperature, colour, and so on, and that nothing else existed. (Black 1952, p. 156)

Black invites us to consider a situation where these two spheres are supposed to be indiscernible in all their qualitative aspects. From this, many metaphysical problems can be formulated. No matter what Black's own original intention is, his two-sphere case is a *thought experiment* which is open to various interpretations. We will start with the natural assumption that there are two spheres and that these two spheres are two substances,[18] and then consider the Problem of Distinction.

For the moment it is important to note that we do not deny that it is theoretically possible to view the two spheres *as one substance* rather than two (as some philosophers in the literature have suggested: for instance, if the space is curved, then what Black conceives might be two "shadows" of the same sphere). All we need is the theoretical possibility that there are two spherical substances.

However, as will become clearer in later chapters, we will argue that an interpretation according to which there are two spherical substances in Black's case is not only an intuitive and natural starting point, but is also highly reasonable. We should acknowledge that we are *not* insisting that there must be two spherical substances *at any cost*: *if* other metaphysical interpretations are genuinely possible, this is fair enough. But we will argue some representative interpretations in the literature which do not share the two-substances assumption are incoherent and have unwelcome consequences, and there is no direct argument against our own two-substances assumption. Hence, in the end it becomes clear that assuming that there are two spherical substances is plausible. This is something we want to say in general about any *negative solutions* (see below), and we will return to such "interpretation issues" in evaluating the Universal Bundle Theory, and later in the chapter on "Humility" about haecceitification.

Hence, the solutions we consider from now on, and on which we dwell in the next few chapters, are all supposed to be the solutions to the following problem: *if* the two spherical substances case is metaphysically possible, then *why* are they distinct (being *two* rather than *one*)? And in comparing their virtues, other non-sphere cases will be considered.

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[17] There are many other cases besides spheres, electrons and complex numbers before and after Black. For instance, three essentially similar persons in medieval times; Moreland's two red spots (2001, p. 140); and Strawson's chessboard (1959, pp. 122–23). See also Blake (1927), Ayer (1954), and Bergmann (1964).

[18] There is much debate over what a "substance" is. The definition we adopt here is Hoffman and Rosenkrantz's "independence" account (1994 and 1997): a substance is the only category of thing which might have only one instance through at least a minimally extended period of time. It is important to note that we do not take substance to be a "thin particular" in Armstrong's sense (1978, 1989); in contrast, it is more like a "thick particular".

In order to address the problem properly, a methodological overview of the extant solutions would be helpful. This is what we will do in next section.

2. Classification in the literature

2.1 Ontological and non-ontological solutions

The first way to classify a solution refers to whether it is ontological or not. This can be seen in Rosenkrantz (1993). We will firstly introduce the classification, and then argue that such a classification is unsatisfactory.

An ontological solution attempts "to explain the diversity of particulars x and y by relating x and y to a *third entity* z", whereas a non-ontological solution does not. For instance, if we hold that x and y's distinction is accounted for by their being distinct chunks of stuff, then this means "x and y are individuated by relating them to another particular, namely, the quantity of stuff constituting x. In this case, the relevant relationships are those of constitution and its complement" (Rosenkrantz 1993, p. 90). According to this classification, the following two proposals (solutions) are quite different:

> Proposal a: At time t, a particular x is diverse from a particular y =$_{df.}$ at t, x bears the relation of spatial apartness to y

> Proposal b: At time t, a particular x is diverse from a particular y =$_{df.}$ at t, x is spatially apart from y

The first proposal is ontological because it relates x and y to an abstract relation, "a qualitative irreflexive relation. In this case, the pertinent relationships are those of bearing and its complement" (Rosenkrantz 1993, p. 91). By contrast, the second proposal is not "ontological" because no extra "relation" is introduced.

But we find such a distinction dubious. Firstly, Rosenkrantz's distinction seems to read ontology off from language. Not all relational *predicates* correspond to relations. For instance, realists about predications could think that relational predications are to be analysed in terms of the instantiation of universals, even though this is not obvious from the surface grammar. Can we not conclude that there is a spatial relation from the fact that x is "spatially apart" from y? Whether the mere predicate "being spatially apart" entails spatial relations or not is unclear. In fact, it seems the above two proposals have essentially the same effect for the purpose of explaining the distinction of x and y: both boil down to something about space.

Secondly, it is important to distinguish "a non-ontological solution to a problem" from "a solution to a non-ontological problem". If a problem is ontological, then it cannot be solved by non-ontological factors. It seems that in order to solve some problem by giving a non-ontological solution, we must first *interpret* the problem as a non-ontological problem.

In one model of understanding, there is *first* a given problem and *then* different philosophers interpret the problem in different ways and then solve it (for instance, in an ontological way or a non-ontological way); but according to another model, there are different problems *from the start* (for instance, the ontological problem and the non-ontological problem), and each has its *own* solutions. In other words, one might say that something's being an ontological problem *means* it needs an ontological solution.[19] If this is the case, then Rosenkrantz seems to choose the first model without giving good reasons. If all the explanations we discuss ought to use some ontological elements to explain the *fact* of distinction, then we cannot make use of anything that does not exist to explain an existent fact. According to the second model, the term "ontological" here might be redundant and misleading *when the Problem of Distinction has already been supposed to be an ontological problem*. Hence, we might argue that an ontological problem cannot have a non-ontological solution.

Finally, Rosenkrantz's distinction is unsatisfactory because it is too coarse for our purpose. Even if the ontological/non-ontological distinction for our ontological Problem of Distinction is granted, it does not help much *within* the space of ontological solutions, which is precisely what we need. For all the ontological solutions in Rosenkrantz's sense, we hope to make further and more detailed classifications. For instance, for those "ontological solutions" which do appeal to third entities, how should we classify these entities? For instance, some entities might be irreducible relations and others might be non-relational. It would be more helpful if these details could be displayed, which is the aim of our new classification.

This sub-section has given reasons for thinking Rosenkrantz's classification not very interesting. Let us therefore consider another classification in the literature.

2.2   Inspiration from PII

Now we introduce another way to classify the solutions, this one inspired by Hawley (2009). This classification seems to be more coherent than Rosenkrantz's, but will be ultimately rejected.

Such a way to classify the solutions can be introduced by noting that some proposals are developed not for the purpose of solving the PoD, but rather for a similar but different purpose, namely to defend or attack the Principle of Identity of Indiscernibles: for any x, y and property F, $\forall F(Fx \leftrightarrow Fy) \rightarrow x=y$. But in effect they could also be used as a proposal to solve the PoD. The reason is not hard see: the contrapositive of the PII is in the form of just those conditionals which the PoD

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[19] An analogy: if scientists can solve a "problem" which philosophers discuss, then that problem should be viewed as a scientific problem. But by saying that there are *philosophical* problems which scientists cannot solve, we do *not merely* mean that there is one problem which can be viewed both scientifically and philosophically, or from two "perspectives". For instance, consider the question "Will there be sound in an empty town hall if nobody is present there?" A scientist would go to the place and conduct experiments to determine how the physical conditions can influence the propagation of sound, whereas a philosopher would probably take it to be a "conceptual" problem: Does the concept of "sound" still make sense when no one can hear it? I think a natural understanding here is that the scientist and the philosopher are solving distinct problems, the empirical one and the conceptual one. They have total different problems from the start. One cares about experience, and the other cares about concepts.

tries to fill up: *If x* and *y* are non-identical substances, then ___. Philosophers who defend PII see Black's sphere-case as a threat for PII, whereas we take the distinction of the spheres as something which needs to be explained. Each defence of PII corresponds to a solution to the Problem of Distinction (though, as we will see, some "defences" of PII, like the universal bundle theory, only "solve" the PoD negatively).

A classification of the defences of PII is outlined in Hawley (2009).[20] Black's spheres are supposed to be two indiscernible spheres, in violation of the PII. So, logically speaking, there are two main methods to defend PII: one is to say the two spheres are not really two; and the other is to say they are still discernible. Hawley calls the former the "*identity defence*" and the latter the "*discerning defence*". But then she also adds to a third defence, the "*summing defence*", according to which the spheres are not identified as "one sphere" but regarded as an extended simple:

> There is a neglected third option: accept the qualitative description of the case, but deny that either of the alleged indiscernibles exists. Instead, posit a single object, with the qualitative features which would have been possessed by the sum of the two indiscernibles, had they both existed and had a sum. In Black's case, this would involve claiming that his universe contains only a simple, partless object, which extends through a disconnected spatial region. This object is not a sphere, and doesn't contain any sphere as a part. I will call this third option the 'summing defence'. (Hawley 2009, Sect. 3)

We are not here going to evaluate whether the summing defence is workable; we say more about this issue when discussing trope theory in Chapter 4. The point is to show how the classification of PII's defences can be adapted for the Problem of Distinction. According to Hawley's framework, there seem to be three kinds of solutions to the Problem of Distinction which we can develop. The first is the identity solution, which denies the distinction of the spheres;[21] the second is the discerning solution, which finds something to discern the spheres ontologically; and the third is the summing solution, which treats the two spheres as one extended simple.

However, we have reasons for not thinking that such a classification is certain, exclusive and exhaustive.

Firstly, it is not clear that in what sense the summing solution should be viewed as a *third* solution besides the identity and the discerning solutions. It has exactly the same effect as the identity solution: to deny the fact that there are two distinct spheres. By contrast, we hold that the summing

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[20] Again, it is assumed that PII is an ontological principle. For other views, see Rescher's semantic treatment (1955) and Pears's analysis (1955) of Wittgenstein's view.

[21] Again, we said earlier that we *assume* there is a distinction, and maybe this is enough to reject all theories which deny the distinction. But that is just a beginning point. Philosophers who are attracted by the identity solution might find that our assumption is too big and unreasonable. To avoid the stalemate and make the discussion more interesting, in Chapter 5 we will object to the identity solution based on the theory itself.

solution should be taken to be a variation of the identity solution: saying the two spheres comprise an extended simple is compatible with saying that they are identical.[22]

Secondly, some solutions seem to be *neither identifying nor discerning*. The *Primitivists* (see section 3 below) who accept there are two spheres (hence not an identity solution) would not try to discern them (hence not a discerning solution).

On the other hand, the classification is not necessarily exclusive: a proposal can be viewed as *both identifying and discerning*. One example is, again, the kind of Universal-Bundle Theory developed by Rodriguez-Pereyra (2004): it holds that the two spheres are two instantiations of one bundle of universals. This is an identifying solution because the two spheres are identified into one "spherical" bundle of universals, but it is also a discerning solution in that it discerns the two spheres by their locations or instantiations (depending on the version of the theory): there must be two instantiations otherwise the distantness of the spheres would be unexplained.

Another solution which is not purely identifying or discerning is to use a *weakly discernible relation* to explain the distinction of the two spheres (also see Section 3 below). It says an irreflexive *relation* between the two spheres explains their distinction. Then, effectively, the two spheres are said to be "discerned", but unlike most discerning solutions which make the two spheres "more separable", the result of using a weak discernible relation has the opposite effect: two spheres are effectively "linked" together by a relation which both of them enter into, and which means they are inseparably connected. The weakly discernible relation, and the appeal to structures in general, unifies the things being discerned. This approach individuates things via *their relations to other things*. In physics, this can be developed based on the notion of "entanglement"; in mathematics and many other areas in general, this can be seen in how graph theory is used to individuate things holistically (Dipert 1997). Moreover, most structuralists would hold that the shared structures are more fundamental than the discerned items within the structures: this, of course, is open to criticism, but the point here is simply that the structuralist solutions do not smoothly fit in the identity/discerning/summing framework.

In this section, we have introduced two main ways found in the literature of classifying the solutions to PoD, and we argued that they are unsatisfactory. Now let us find a better classification.

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[22] Maybe the difference between summing and identifying lies in Hawley's intuition about mereological composition and non-mereological constitution. As we will see, the representative identity solution is the Universal-Bundle Theory, on which the two spheres are one bundle of immanent universals: in that situation, everything is understood in terms of properties and their instantiations. By contrast, when we sum the two spheres in order to take them as an extended simple, we are using mereology. The mereology intuition and the property intuition will give us distinct pictures: the universal-bundle theory would make the two spheres into one bundle, while the mereological intuition will make the two spheres into one extended object. But why is saying there is only one bundle more an "identity defence" than a "summing defence"? We saw similar problems in Chapter 2 where it was argued that the PoD is not limited to symmetrical cases: one idea is that being extended in a certain way is itself a property, which should be contained in the one bundle. Then there is no reason to prevent that extended, spatially scattered "simple" from being a bundle of universals as well. The result of the summing defence is not essentially different from the identity defence.

3.   A better classification: The Positive and the Negative

On the basis of the reflections set out above, we now propose a way to avoid these confusions by classifying the solutions into two kinds: the *positive* solutions and the *negative* solutions. The positive solutions are solutions that assume the distinction of the spheres and try to provide informative metaphysical entities to solve the PoD; by contrast, the negative solutions are solutions that do not share our assumption and instead try to eliminate the problem. (More accurately speaking, we should say that these are proposals, not "solutions", but we will retain the latter terminology here.)

For purpose of completeness, in what follows we lay out most of those solutions according to the new classification. Among these solutions, some make a greater claim on our attention than others. Since it is not possible to elaborate each of them in detail in this thesis, we will only select certain important ones as targets for later investigation, and briefly explain why some other solutions are problematic and hence will be ignored here.

Positive solutions

As we argued, all the positive solutions appeal to further metaphysical entities, but within the set of positive solutions we could make a point which is similar to Rosenkrantz's: namely, that some positive solutions employ non-relational entities, and some do not. As far as the problem of individuation *in general* is concerned, philosophers in the literature have used, or could have used, positions including the following:

Non-relational entities

1.   Spatio-temporal points (Locke 1828, Campbell 1970)

    The distinction of spatiotemporal points explains the distinction of two substances. There are two distinct substances if and only if they have two distinct spatiotemporal points.

2.   Tropes (Maurin 2002, Gibb 2015)

    The distinction of two sets of tropes explains the distinction of two substances. There are two distinct substances if and only if they have two distinct sets of tropes of the substances.

3.   Bare particulars (or substratum) (Moreland 2001, Connolly 2015)

    The distinction of two bare particulars explains the distinction of two substances. There are two distinct substances if and only if they have two distinct bare particulars.

4.   Haecceities (or individual essences[23]) (Rosenkrantz 1993, Diekemper 2009)

    The distinction of haecceities explains the distinction of two substances. There are two distinct substances if and only if they have two distinct haecceities.

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[23] There is a difference between haecceities and Plantinga (1974)'s individual essences, however. See Chapter 6 (A).

5. Matter (with dimension) (Aquinas 1968)

   The distinction of chunks of matter explains the distinction of two substances. There are two distinct substances if and only if they have two chunks of matter.

6. Qualitative properties

   The distinction of properties explains the distinction of two substances. There are two distinct substances if and only if they have two distinct sets of properties.

7. Causes and effects (Davidson 1969)

   The distinction of causes and effects explains the distinction of the two substances. There are two substances if and only if they figure in different causal relations.

8. Mereology

   The distinction of parts explains the distinction of the two substances. There are two substances if and only if they have distinct parts.

Relational entities

9. Structuralism (Dipert 1997, Ladyman and Ross 2007, Ladyman and Bigaj 2000, Caulton and Butterfield 2012, Linnebo and Muller 2013)

   The existence of a holistic relation (structure) explains the distinction of the two substances. There are two substances if and only if they have distinct positions in a relation or structure.

Negative solutions

We will mention four representative solutions which are negative:

10. Primitivism (Lewis 1986)

    There is nothing to explain. It is a brute fact that some things are two distinct substances.

11. The Identity Solution with three sub-classes

    11.1 Summing solution (Hawley 2009)

    The seemingly distinct substances are not really distinct. They are one extended simple.

    11.2 Universal Bundle Theory (Rodriguez-Pereyra 2004, Curtis 2014)

    The seemingly distinct substances are not really distinct. They are of the same bundle of universals.

    11.3 Curved Space Hypothesis (Hacking 1975)

    The seemingly distinct substances are not really distinct. Their distinction is because the shape of space is curved in a certain way.

12. Indeterminism

    There is no matter of fact as to whether two substances are distinct or not.

13.   Verbalism (Rescher 1955, Wilson 1955, Aranyosi 2011) or epistemicism (Pears 1955)

The problem is mainly linguistic or epistemic. We can explain the sphere-distinction via theories of names or cognition.

The structure of the above classification is easy and clear to understand.[24] It is not hard to see why it is better compared with the previous classifications. It is more informative and coherent, with no problem of non-exclusiveness: even if a proposal could be said to be neither identifying nor discerning, or both identifying and discerning, it must be either positive or negative.

Recall, as we said earlier, that there are three kinds of solutions. Some are for the sphere-like cases only, some are for the apple-and-banana cases only, and some are for both. In the literature, positions 1 to 4 are discussed in the context of spheres, but they can all be used in the general cases. For instance, if two spheres are two because of two bare particulars, then the same can be said for an apple and a banana. On the other hand, it seems position 11 (the identity solutions) can only deal with special cases: because even if the spheres can be identified as one, it would be implausible that an apple and a banana (or any other comparable pair) should also be so identified, unless monism is embraced (more on this in Chapter 5).

Also, among these 13 positions listed above, some proposals have prestigious defenders while some are rarely supported, and are listed just for completeness. As we have remarked, some proposals are easy to dismiss whereas others require great efforts to evaluate and compare. In the next few chapters we will select four positions (1, 2, 3, 4) from the positive kind and one position (11.2) from the negative kind as our main focus. But here it also seems necessary to devote a few words to the ignored solutions, because we ought to have good reason to leave them behind without going into many details.

Position 5 (the chunk of stuff) is defended by Aquinas, but the relevant ideas are a matter of controversy in the history of philosophy. Aquinas would have argued that the two spheres are constituted by different chunks of matter, which is why they are distinct. But firstly there is an issue regarding the meaning of "stuff" which itself is not easy to resolve. It does not fit into the substance-property model which today most metaphysicians naturally adopt. Secondly, Scotus rejects Aquinas' solution with stuff because he holds the problem is not only about distinction but also about indivisibility, and that stuff cannot be used to account for indivisibility. If a solution not only solves the PoD but also the Problem of Indivisibility, that solution would be better than position 5. (See the next chapter and Chapter 6(C) for more on this point.) So, we will not spare an extra section for this solution.

Positions 6 and 7 are widely used in the individuation of ordinary objects. Position 6 has already been criticized in Chapter 2, where we argued that qualitative properties cannot be used to

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[24] Of course, it is possible to list more proposals here by constructing some "*mixed view*". For instance, we might use *both* bare particulars and tropes to explain the substance-distinction. But this is much less motivated.

explain the distinction of ordinary things satisfactorily. As regards both positions, they cannot be applied to the spheres. No philosophers use qualitative properties to ground the distinction of spheres.[25] On the other hand, even if position 7 can be used for ordinary objects or events[26], it cannot be applied to the spheres because it is hard to say what the causes or effects are for the spheres in the Blackian world.[27]

Position 8 may be a bit better but is still unsatisfactory and incomplete. It seems okay for general cases. And it might be right to say that even in the sphere case, the two spheres do have distinct *parts*. But that merely takes us one step back: what further makes the two parts distinct? Arguably, a part of a sphere is still of the same kind of entity as the whole sphere. And what if the spheres (or similar entities) do not have parts at all?[28] The "mereological simple" (even extended!) is arguably a fully intelligible notion. (See for instance McDaniel 2007. Also see Chapter 4 on tropes, and more importantly in Chapter 7 we will give a detailed mereology with haecceity theory.)

Position 9, *structuralism*, which has been mentioned earlier, is widely discussed in epistemology, philosophy of science and mathematics.[29] But, besides its own controversies, it is not clear whether we can motivate a serious ontology based on epistemic considerations: the very individuation of "structure" itself seems more problematic than the individuation of substances given the highly diverse interpretations of the word in the literature. For example, one representative here is what some philosophers call the *weakly discernible relation*: for any x and any y, if Rxy but not Rxx, then the existence of R entails the distinction of x and y. But, as Lowe points out, such a relational view makes sense for the Problem of Distinction only when structuralists have an unambiguous way to generate distinct *properties* from the "*artefact* of their preferred logical notations"; however, such a

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[25] One interesting problem, which we had no room to discuss in the last chapter, concerns the *modal properties* or something similar. For instance, Hoy (1984) holds that the two spheres can be distinguished *if a third entity is introduced.* (In fact, George Berkeley (1713) would have argued that in conceiving two spheres, we have to include *a third observer.*) See Gaskin (2016) for a recent reply. What we can say here is that Hoy's position again changes the assumptions behind the problem, namely, the spheres are *qualitatively* indiscernible. And it seems modal properties or counterfactual properties are also qualitative because they are *grounded in* qualitative properties. It can be said that, if the two spheres are actually indiscernible, they must be necessarily indiscernible. One argument for this is similar to Kripke's argument (1980) for the necessity of identity: if a and b share all their properties, then one of the properties a has is *being necessarily indiscernible from* a. Hence b also has that property, which means a and b are necessarily indiscernible. Even if this argument is rejected (e.g. see also footnote 209), we can simply define our problem as a case where modal properties are shared, and make a distinction between indiscernibility and *super-indiscernibility*. The former only deals with the actual case.

[26] One further worry for position 7 is that if causes and effects themselves are events, then Davidson cannot use them to individuate events because it will be circular.

[27] Unless we take haecceitification as variant kind of causation because there might be a controversial sense in which metaphysical realization or constitution is also a case of causation.

[28] It is important to note here that in the current context, as many would think intuitively, the "part" here means "*spatiotemporal part*" instead of "property part". An extended simple does not have spatiotemporal parts, but it can still have property parts.

[29] Interestingly, Menzel (2018) discusses a structuralist view of haecceities, which shows *even if* structuralism is accepted, there is still room for haecceities. See also Schwarz (2015) and Dorato and Morganti (2013).

way does not seem to have been found yet (Lowe 2016, p. 58).[30] Hence we have good reason to leave structuralism aside for the purpose of this thesis, although we will say a bit more about it in section 4 of Chapter 3(B), in order to demonstrate how our principle of evaluation works.

Position 10, primitivism, is methodologically controversial. Lewis (1986, pp. 192–23) does famously say that "there is no problem of distinction or identity", but there is no consensus as to how to interpret it (see for instance Nolan 2005, Burgess 2012, Fine 2016). All we need to claim here is that the Problem of Distinction is not simply an *analysis* of the notion (or perhaps the relation) of "distinction" *per se*; rather, we are trying to explain the fact that *some substances are distinct*, which is intimately connected with the seriousness of ontological categories. (See next part on principles of evaluation.) Unless good reasons are given, and unless other informative proposals are *all* considered and rejected, we have no motivation to believe in primitivism. It is the last resort. In fact, if the spheres' distinction is primitive, then why not say many other things which cry out for explanation are also primitive? The line for a primitivist is hard to draw, if arbitrariness is to be avoided.[31] But also note that we are not denying that every theory has to presuppose some *primitives*. The real issue is whether the primitives can do enough work. For instance, it might be said that the two haecceities are also primitively distinct,[32] but this is better than the primitivism of the distinction for substances because haecceities can be used to explain a lot of things and have wide application.[33]

Positions 11.3 (Curved space solution) was first advocated by Hacking (1975) and has some appeal. It holds that whether the spheres are two or one depends on the shape of the space. But again it does not warrant a lengthy discussion here because, firstly, it is too limited, as there are many other similar cases which are not sensitive to the shape of space: for example, as we will see in the next chapter, some entities are co-located, and some entities are non-located and nonspatial at all; and further, the individuation of space points themselves poses further problems. Secondly, as

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[30] This notion is from Quine (1976), but was recently made popular by structuralists. In detail, it is said that a weak discernibility relation R could explain the distinction of x and y because Leibniz's Law itself *defines* a relation according to which a distinctive property can be used to distinguish *x* from *y*: if we replace "R*x*" in the definition of a weak discernible relation "**R***x*y and not **R***x*x", then we get *x* does not have the property R*x* and *y* has the property R*x*, so *x* and *y* are distinct. But (*even if* logical entailment means "explanation") Lowe (2016) argues that we must distinguish three ways of getting properties from the weak discernible relation definition: (1) ~λ*x*(R*ax*)*a* and λ*x*(R*ax*)*b*; (2) ~λ*x*(R*xx*)*a* and λ*xy*(R*xy*)*ab*; and (3) ~λ*xy*(R*xy*)*aa* and λ*xy*(R*xy*)*ab*. If these ways are distinguished, it will be clear that weak discernibility cannot explain the distinction non-circularly, which means the proposal fails.

[31] For instance, a complicated defence might be adapted from Burgess (2012), where he argues that the grounding distinction is always circular. But once we realize that there are different *kinds of facts of distinction*, the circularity disappears. For instance, the fact of substance-distinction is different from the fact of their property-distinction.

[32] However, if what we said in the second part of the thesis is right, one might ground the distinction of haecceities via the qualities they haecceitify (see Chapter 9), which avoids primitivism for *some* (even if not for all) haecceities. We will be open here.

[33] Our point will be further supported if we realize that most philosophers who have primitivist tendency also believe in nominalism. Many nominalists refuse to give an analysis of the inner structure of particular objects at all. But if, as said in the Introduction, we assume there are realist universals, then primitivism will not be attractive because we need to understand how universals are related with substances.

Rosenkrantz (1993) argues, a two-sphere shaped space and a one-sphere shaped space are *distinct regions of space*. Hence Hacking's solution seems irrelevant because our problem is, *assuming* a certain shape of space where the spheres are two, what explains the distinction of the two spheres. (The problem of irrelevancy is common for the negative solutions in general, but some other negative solutions are more complicated and worth a closer look. See also Chapter 5.)

Finally, positions 12 and 13 are too big to be evaluated here due to the word limits of this thesis. Even in doing epistemology and philosophy of language, we may still be in the neighbourhood of problems of distinction which we then have to face: for instance, what makes two names have *distinct semantic meanings or not*? For our current purposes, it seems sufficient to say that here a classical methodology is simply *assumed:* whether things are identical or not is a *determinate* matter in ontology. All metaphysical works have to start with some meta-metaphysical assumptions, even if these assumptions are not infallible.

To sum up, we have proposed a better classification. And allowing for all that we have said above, we may hope that the selection of the positions for further investigation can be reasonably accepted.

4.   Conclusion

Part 3 (A) of this chapter has discussed various ways to classify the solutions to the Problem of Distinction. Firstly, Rosenkrantz's classification was declared superficial because all solutions to an ontological problem should also be ontological; and it is also uninformative. Secondly, the classification inspired by Hawley was also deemed unsatisfactory because it is not exclusive and exhaustive. Finally, we proposed to classify the solutions in terms of positivity and negativity. We also gave reasons for selecting some positions for further investigation. The positions selected are the following:

Space-time Points Solution (Chapter 4A)

Bare Particularism (Chapter 4B)

Trope Theory (Chapter 4C)

Universal Bundle Theory (Chapter 5)

Haecceity Solution (Chapter 6)

In the next few chapters, we will explore each of these selected positions and evaluate them as a solution to the Problem of Distinction. But first it is necessary to set up some principles for evaluation. This is the task of the second part of this chapter.

Chapter 3 (B)
A Classification of Solutions and Principles of Evaluation

After classifying the solutions, let us continue by setting up some principles of evaluation for these solutions. Section 1 is about the general methodology we use, namely inference to the best explanation. Section 2 is an overview of the principles of evaluation for the solutions in the literature. Sections 3 and 4 propose other important principles. Arguments and examples are given to support them. Section 5 is a summary.

1.   Inference to the best explanation

As will be shown, the solution we offer in the remainder of this thesis is by *haecceities*. Our main argument is based on an inference to the best explanation (IBE),[34] which seeks to show that the distinction of haecceities of the two spheres is the best explanation of the fact that they are distinct substances.[35] (But the point can also be extended to general cases of distinction.) It will be argued that other solutions are unsatisfactory for various reasons. Before going into the detailed principles of evaluation, some explanation of IBE would be helpful.

In spite of some scepticism, IBE is still ubiquitous not only in philosophy but also in sciences, medical diagnosis, and everyday life. In general, it is a form of reasoning as in the following:

> Given evidence E and candidate explanations H_1, … , H_n of E, infer the truth[36] of that H_i which explains E best, provided H_i is satisfactory/good enough qua explanation. (Douven 2017)

In our context, the evidence is that there are two spheres, and the various solutions listed in the last section are all candidate hypotheses. Under this view, the key issue lies in the criteria of being satisfactory or being good enough. A theory which is "good enough" needs to meet at least the following requirements.

One requirement is *coherence*: we cannot accept a theory which is logically inconsistent. And coherence involves more than logical consistency: it requires mutual support among the statements of the theory. Also, we usually hold that a theory is preferred if it is in accordance with *common sense* and does not require radical adjustment of our web of belief. As Reid (1863, p. 422) puts it, "All knowledge and all science must be built upon principles that are self-evident; and of such principles every man who has common sense is a competent judge". A classic application of this method can be seen in Moore's (1925, 1939) argument against scepticism.

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[34] Sometimes it is also called "abduction", but historically C. S. Pierce uses the term differently. So we will only use the term IBE.

[35] It is possible to rewrite the IBE argument of haecceities in a deductive form. See Bates (2010) and Park (2016).

[36] Clearly, as most philosophers (especially of science) would agree, this should not mean the accepted hypothesis has a necessary link with truth.

Another criterion widely used in IBE is *simplicity*, sometimes known as the principle of parsimony, or more famously Ockham's razor: "If a thing can be done adequately by means of one, it is superfluous to do it by means of several; for we observe that nature does not employ two instruments where one suffices" (Aquinas 1945, p. 129) This is not only widely accepted in philosophy, but also in science: Einstein (Barnett 1950, p. 22) says, "[T]he grand aim of all science … is to cover the greatest possible number of empirical facts by logical deductions from the smallest possible number of hypotheses or axioms". Moreover, it is convenient to distinguish *qualitative* parsimony from *quantitative* parsimony: the former is about how many *kinds* of entities we postulate, and the latter is about the absolute quantity of the entities themselves.

Of course, it would be incorrect to favour a theory *merely* because it is simple. It must work with other criteria together. When a criterion is demonstrated, it only means that all the other things equal the theory would be better if an extra virtue is possessed. Other considerations include *unification*, *generality*, and even *aesthetic* properties (see Benovsky 2016). We cannot cover all of them here, but most will be reflected in the principles given below. Rather than elaborating those methods in detail, we will show how they are used by considering specific arguments. With IBE as a general guidance of evaluation, now we need to set up some *specific* principles of evaluation for the solutions to the Problem of Distinction.

2.   Principles of evaluation in the literature

We have discussed some general virtues our theory needs to have; now we will develop some principles of evaluation. To begin with, we may remark that there have been some principles in the literature we agree with, but that these principles are not enough and some need to be more fully developed.

In section 2.4 of his *Haecceities* (1993), Rosenkrantz argued that a proposed explanation of a distinction fact is inadequate[37] if it possesses any of the following five defects:

(1)   The proposal fails to provide a logically necessary condition of the diversity of concreta at a time

(2)   The proposal fails to provide a logically sufficient condition of the diversity of concreta at a time

(3)   The proposal is conceptually circular

(4)   The proposal exhibits familiar triviality

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[37] Rosenkrantz uses the term "criterion of individuation", but what from what he said it appears to be the same as the solutions to the PoD. To find a criterion of individuation of the spheres is partly to give an explanation of their distinctness.

(5)   The proposal presupposes circular individuation

Let me briefly explain each of these. It is not hard to see why (1) and (2) are defects according to our definition of the problem: we need to find a sufficient and necessary condition for the distinction of the two substances. Defects (3) and (4) are also clear enough: a case of conceptual circularity might be: *x* and *y* are distinct if and only if *x* is distinct from *y*. The concept of distinction is used circularly, which makes our explanation uninformed (of course, this does not mean no circularity can be informative). And a case of triviality might be: *x* and *y* are distinct if and only if *x* is not identical with *y*.

Principle (5) is worth elaborating. Like (3), it is also about circularity, but not *conceptual* circularity. A conceptual circularity is directly about some concept, which often is not difficult to recognize, while a circularity of individuation requires more analysis. According to Rosenkrantz, for any ontological category C an attempted explication E of the diversity at a time of instances of C presupposes circular individuation if

> in every possible case E seeks to explain two instances of C being diverse (*x* and *y*'s being diverse) at any time, *t*, by relating *x* (or *y*) to another entity, *z*, which is an instance of C at *t*, in such a way that *x* and *z*'s (or *y* and *z*'s) being so related entails that *x≠z* (or *y≠z*). In particular, a purported analysis, A, of the diversity of concreta at a time has this defect if in every possible case A seeks to explain **two concreta** *x* and *y*'s being diverse at *t* **by relating *x* or *y* to another concretum *z*** existing at *t* in such a way that *x* and *z*'s (or *y* and *z*'s) being so related entails that *x≠z* (or *y≠z*). (1993, pp. 94–95)

Why is explaining "two concreta" by relating them to "another concretum" problematic? Consider two British cities, London and Durham: one way to explain why London and Durham are distinct, as shown above, is to relate them to another city, say, Edinburgh. Durham is about 100 miles away from Edinburgh while London is about 400 miles away from it. In doing so, we explain the distinction between Durham and London by their distinction with a third city, Edinburgh.

This might seem a good explanation for some. But a good explanation of *what*? It is a good explanation of the distinction of the *two specifically given cities*, London and Durham, but it is *not* a good explanation of *the distinction of any British cities* because the explanation we appeal to, the distinction between Durham (London) and Edinburgh, is also a distinction of British cities. And the distinction between Durham and London is *of the same kind* as the distinction between Durham and Edinburgh. This is what Rosenkrantz means by vicious "circular individuation" because it assumes what needs to be explained. Namely, it assumes that Edinburgh is distinct from the cities under consideration.

To appreciate this, we must note how Rosenkrantz's understanding of the Problem of Distinction relates to ours. For him, the proposal we seek is "a formal principle of individuation for entities belonging to a certain very general ontological category—the category of *Particular* or

Concretum" (1993, p. 93),[38] and his Problem of Distinction asks for explanations of the *general distinction of any two concrete particulars*: if we explain the distinction of *any* particular *x* and *y* (where "*x*" and "*y*" are not proper names) by another particular *z* and by the fact that *x* or *y* and *z* are distinct, then we will have a vicious circular individuation because the distinction of *x* and *y*, and the distinction of *x* or *y* and *z*, are ontologically *on a par*, we cannot presuppose one to explain the other. The distinction of Durham and Edinburgh is as much of a problem as the distinction of Durham and London, if the problem is what makes two British cities distinct.

However, one quick reply might go like this: it is true that the distinction between Durham and Edinburgh is the same kind of distinction as between Durham and London. But in our explanation of the distinction between Durham and London, *what does the job is not a third city alone, Edinburgh, rather it is the different relations or relational properties that explain the distinction.* If Durham and London bear different relations to a third city, or in other words they have different relational properties, then according to Leibniz's Law[39] they are distinct. The original circular individuation exists because Edinburgh belongs to the same category as London and Durham, but here Edinburgh itself is not the main concern. No circular individuation here.

Nevertheless, this is compatible with Rosenkrantz's original intent: in fact, the non-circular individuation principle is a principle of category-distinction. A category is a category of "what kinds of things can exist and coexist" (Lowe 2006, p. 5), and things of the same kind cannot reveal their nature from each other alone. In order to avoid the circularity, the explanandum and the explanation must be from distinct categories. Whether using properties to distinguish Durham from London is non-circular or not depends on whether the relational properties or relations belong to the same category as the cities. If cities are substances but properties of them are not substances, then we can find non-circular individuation because substance and properties are distinct categories.[40]

Thus, like Rosenkrantz, we take categories seriously, and we hold that a genuinely interesting Problem of Distinction could only be raised within a category system; although Rosenkrantz assumes that the highest categorical distinction is between *abstracta* and *concreta*, unless noted otherwise, we embrace an intuitive and fruitful two-category ontology of substances and properties, which is widely adopted by influential metaphysicians (Martin 1980, Heil 2012).[41] Substances are properties-bearers

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[38] He seems automatically to take the Problem of Distinction as *synchronic* because all the proposals he discusses are about the distinction of two given concrete particulars at a time. This, however, is a minor difference from us.

[39] It says if *x* and *y* are identical, then anything true of *x* will be true of *y*. This should not be confused with the identity of indiscernibles, which says if two things are indiscernible, then they are identical.

[40] See also Lowe (2010) on the individuation of powers. According to Lowe, powers cannot be individuated by referring to entities which are also powers. If they are not primitively individuated, then we must find something from a distinct category.

[41] Note that here we will be open about the detailed relationship of these two categories and later in the thesis we will give a unique way to understand it via an ontology of haecceities. Also note that although many could be said to be two-category ontologists, different philosophers have different understandings of "properties". For instance, Heil takes properties to be tropes (modes) while here we just assume properties are universals.

and properties characterize substances. As mentioned in the Introduction, although there are substances, that does not follow that substances do not further analysable structures. In the second half of the thesis, we will analyse the notion of characterization or instantiation in terms of property mereology. But for current purposes it suffices to start with an intuitive understanding of these categories.

If the Problem of Distinction is a generic one and relative to a category, then circular individuation should be avoided: we *cannot* use another substance to explain the distinction of *any* two substances. We cannot use the entities to explain the distinction of the entities of the same category. Where there is a category, there is a correspondent level of distinction. The non-circular individuation principle could boil down to a principle about categories.

Now the following three principles are established:

[P1]   *An explanation A of a distinction fact must provide the sufficient and necessary conditions for the distinction fact.* (Definition of the Problem)[42]

[P2]   *An explanation A of a distinction fact cannot have conceptual circularity and familiar triviality.*

[P3]   *An explanation A of a distinction fact must look for entities from a distinct category.* (Non-circular Individuation)

3.   The Non-circular individuation principle upgraded

We have explained Rosenkrantz's principles; now some new principles will be developed based on the ones above. How, for instance, should we compare two theories if both appeal to entities from another category? Then it seems the following principle could be tentatively introduced:

[P4]   *If both fact A and fact B can give an explanation for fact C, where C is a fact of distinction, then ceteris paribus A is a better explanation than B if **the distinction of A and C is less controversial than **the distinction of B and C**.*

Let us give an example: to explain the fact that Jeremy Corbyn is distinct from Theresa May, one explanation (E1) we might give is to say that these two persons have different *bodies*. Another explanation (E2) is to appeal to the fact that they have different *parents*. To make sense of E1, we need to presuppose the persons are *not* merely their bodies, otherwise the explanation would be circular: if persons are just their bodies, then the question "why are the two persons distinct?" would simply mean "why are the two bodies distinct?" So E1 needs to presuppose a distinction between a person and a body to avoid circularity. By contrast, to make sense of E2, we also need to the presupposition that a child's parents are distinct from the child, but this presupposition is much more

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[42] Henceforth for brevity we will speak simply of "a solution being necessary and sufficient".

certain and reliable. The chance that someone's parents are not distinct from him or her is *much lower* than the chance that persons are identical with their bodies. The former is obvious, while the latter is a controversial stance in philosophy of mind and personal identity. Both the body-explanation and the parents-explanation could be used to explain the distinction when the presuppositions are clear, but one presupposition is better established than the other, to wit, the distinction between the parents and these two persons is better established than the distinction between persons and their bodies. So, the parents-explanation is better.

How to determine which explanation is "less controversial" may be not easy in some cases. But an example more relevant to the Blackian spheres could be seen when we consider one argument against using space-time to explain the distinction. We go on to evaluate detailed proposals in the next chapter, but here we just offer one example to demonstrate why this principle matters.

An application of principle 4

Among many proposals, one of the most intuitive explanation of the distinction of the spheres is that they have different space-time points (for instance, Campbell 1970): the two spheres have distinct locations. But in order to use space-time to explain their distinction, as we have shown above, we must assume that the space-time appealed to and the spheres are indeed distinct: however, according to some modern physicists as well as "Spinozaian" monists (also known as "blobjectivist") philosophers (for instance, Schaffer 2007, Horgan and Potrc 2008), the entirety of "space-time" itself could be the only one substance we have. It might be the case that one sphere is only a *region* of it, rather than an *occupier* of it: what we take to be two spheres is just a certain mode of the big space-time, much like a "hole" is just a mode of space and does not have its own independent existence.

The details are open for discussion. But the point is the relation between the spheres and the correspondent space-time is too unclear to be treated as a real "distinction". (In fact, it not only challenges the distinction between the spheres and their spacetime, but also the very *substantiality* of the spheres we assume in the beginning.) Anyone who tries to explain the distinction of the two spheres by their space-time locations needs to assume a strong and controversial stance on the relation between space-time and the spheres, which makes the proposal vulnerable. If alternative proposals could make use of entities which are distinct or separable from the two spheres in a "better established" way, they would be better. This does not mean that there is no independent argument for the "separation" of space-time and the spheres, but, as we will argue in the next chapter, even in that case the spacetime proposal still faces serious problems. If this is accepted, then P4 will be justified.

Now we have altogether four principles of evaluation. Let us move onto other principles.

4.   Other principles

(a)   The Indivisibility Principle

A constant desideratum in doing metaphysics is the need to be *systematic* and general. This requires us to look for a proposal that can solve problems non-piecemeal. If a theory can address more problems than other theories, then it has a clear virtue. So the following principle of evaluation should be accepted:

[P5]   *An explanation A is better than B in solving the PoD if, ceteris paribus, A not only solves the Problem of Distinction, but also solves the Problem of Indivisibility.*

Recall what we mentioned before in the Introduction: the Problem of Distinction is about what makes one entity distinct from others, and especially about why there are still *many* substances even though they share *one* set of properties; while the Problem of Indivisibility tries to explain the individuality of one entity alone. To be more specific, firstly, the Problem of Indivisibility asks what makes *many* properties unified into *one* substance without their falling apart: for instance, there seems to be a tomato with the universal being redness and being sphere, but what make these universals *both a universal of the very same tomato?* Secondly, it asks what makes a substance non-instantiable, that is, why a substance cannot have *substantial parts* which are also substances (if instantiability turns out to be something similar to parthood at all). Why is redness instantiated by the tomato, but not vice versa? Why cannot we say the tomato is also instantiated by redness? Thirdly, it asks *how* universals and substances are distinct categories, and what makes a universal individualized into a substance.

We will talk more about indivisibility in Chapter 6(C). But here let me give an example.

An application of principle 5

As we briefly mentioned in Part 3 (A) of this chapter, one novel proposal to explain the distinction of the spheres is to say they are *weakly discernible*: two entities a and b are weakly discernible if and only if there is a relation R such that R (a, b) but not R (a, a). There is a structure which determines the positions of the spheres and it follows from this fact that the two spheres are distinct (see for instance Dieks 2014). Among the many problems of this proposal, one related to the above principle is this: even if a structure can explain what makes the two spheres two, it says nothing directly about why one sphere is the sphere it is. As we argued before, the Problem of Indivisibility and the Problem of Distinction are related, but they are two problems, and this is because a weakly discernible relation is a relation of at least two spheres. But it is possible that *there is only one sphere for which the individuation (namely, to explain why the one substance is unified and "indivisible") could still be demanded.* If there are not two spheres, then the weakly discernible relation cannot exist at all.

In other words, absolute identity is relatively independent of absolute difference. If there is only one thing in reality, the ONE reality is still self-identical and individuated. Its singularity or oneness does not come from other "external" entities. Even if there is only one sphere, we still need to

know what makes its properties unified and individuated, and what makes it that the sphere's parts are not themselves spheres (substances), and so on. Thus, if a proposal could be applied to the Problem of Indivisibility even when the Problem of Distinction does not pertain, that proposal would be better than structuralism.[43]

It might be said that the violation of Principle 5 itself may not be as fatal as the violation of some previous principles. Failure to give necessary and sufficient conditions is much worse. And structuralism might still be true provided it can still deal with the case of distinction. But still this principle expresses a desideratum; and, as we will see later, this makes haecceity theory better than many other extant solutions. As explained in Part 3 (A) of this chapter, we will not further discuss structuralism in this thesis.

(b)   The Generality Principle and Non-revenge Principle

Likewise, a proposal is preferable if what it can explain is not only limited to certain special distinction cases, but also the *general* cases.

> *An explanation A is better than B in solving the PoD if, ceteris paribus, A not only explains the special cases, but also the general cases of distinction.*

Two kinds of "generality" are expected to be covered: the first kind is the non-symmetrical cases, which is what we saw in Chapter 2; so, if a proposal not only explains why the two spheres are distinct, but also explains why a sphere and a cube are distinct, then it should be preferred. In fact, it would seem very odd if, for instance, haecceities are only used for explaining the distinction of the two spheres and *not* used for other cases where the distinction of substances may be much more salient.

But there is another type which is of interest here: the distinction of the *individuating entities themselves*. If the fact that entities x and y are distinct is used to establish the distinction of the two spheres (qua substances), then it is natural for us to raise the problem of distinction at a higher level: what makes x and y distinct? If both the fact x *and* y *are distinct* and that s *and* t *are distinct* can explain the distinction of the two spheres, then which is better will depend on which fact of distinction is more fundamental and needs less explanation. A better explanation will face "fewer regresses". Call this the *Non-revenge Principle*.[44]

From the principle above we can generate two further principles about generality, P6 and P7:

[P6]   *An explanation A is better than B in solving the PoD if, ceteris paribus, A not only solves the problems in symmetrical cases, but also non-symmetrical ones.*

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[43] Another important application of this principle could be seen from Scotus' criticisms of Aquinas' proposal to individuate things by their designated matter. See Chapter 6(C).

[44] The term is borrowed from a tradition on the semantic paradoxes. See Field (2007).

> [P7] *An explanation A is better than B in solving the PoD if, ceteris paribus, A faces fewer revenge problems than B. That is to say, the same form of the PoD would not reoccur within the explanation.*

An application of principles 6 and 7

One application of principles 6 and 7 can be seen by evaluating one of the "negative solutions", the Universal Bundle Theory (see Chapter 5). Roughly, the proposal identifies the two spheres as one bundle of *bi-located immanent universals*. But according to principle 6, even if it is successful in identifying spheres, such a theory is very limited because it cannot be smoothly extended to ordinary, non-symmetrical cases. In fact, most UBT theorists in the literature argue that there would be a "collapse" when we make two almost-indiscernible entities completely indiscernible: if *a* and *b* are almost but not completely indiscernible (for instance, sphere *a* has a small scratch on its surface), then UBT would say that there are two distinct spheres and would not identify them, while once the small difference disappears, the two spheres would collapse into one. Such UBT identification is only available in symmetrical cases: even if such a "collapse" is coherent, when compared with a theory where a *unified treatment* would be given, the latter should be preferred.

Besides other problems which we will discuss later, UBT is also problematic because of principle 7: it faces a "revenge problem". Even if the sphere is bi-located, we still need to understand the fact that there are two distinct locations. The distinction of spheres can be avoided, but not the problem of the distinction of the locations.[45] Further, if both locations and haecceities can be used to explain the distinction, and locations themselves also have haecceities, then that will mean the distinction of haecceities faces *less revenge problem* than the distinction of locations because haecceities would be more fundamental.

Another example

To get a deeper understanding about the Non-revenge Principle, here is another example. We may try to explain the following fact: some flowers are blue, while other flowers are pink. One explanation is

> *Flowers reflect the light in different ways*

Another possible explanation is

> *Flowers contain different chemical substances and genes which determine their differences on their surfaces*

According to principle 7, the latter explanation is better in the sense that it not only explains the original fact, but also the former fact which is used to explain the original fact: it also explains why

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[45] Also, for the very bundle of universals itself, what if there are two "indiscernible" bundles of universals? How to distinguish one bi-located bundle of universals from two co-located bi-located bundles of universals? This might not be a decisive objection provided a careful analysis of the notion of a "bundle" could be given, but at least it reveals that the current version of UBT is far from satisfactory. See more in Chapter 5.

those two kinds of flowers reflect light differently, and the same form problem of distinction *reoccurs* if we ask what further explains their distinct abilities to reflect light. But the fact about chemistry and genes not only explains why some flowers are blue and others are pink, but also explains why blue flowers and pink flowers reflect light differently. Such an explanation is more powerful and covers a *wider range* of phenomena, and it faces *less* "revenge problems" (or regresses) than the former explanation. Admittedly, the chemical explanation itself may still not be the final explanation we can reach, and it also faces its own revenge problem; however, the chemical explanation reaches a lower level of reality, going "deeper" than both the level of biology and psychological experience. Though the idea of a hierarchical reality is open to debate, the point this toy model tries to show should be clear: we should find a theory which faces fewer revenge problems.

Hence the application of the Generality principles have been demonstrated. Now let us turn to the final principle we hope to set up.

(c)   The Priority Principle

One possible reason why one explanation faces *less* of a "Revenge Problem" than others is that the distinction of the entities the explanation appeals to is so fundamental that it resists any further explanation. Guided by this spirit, we might infer that the best explanation of the distinction would be one that uses entities that are (or are very near to being) distinct *primarily*: their distinction cannot be further analysed at all. The *more fundamental* an entity is, the more primarily diverse it is from other entities. So, we can write down another principle via fundamentality.

>   [P8]   *An explanation A is better than B in solving the PoD if, ceteris paribus, the entities involved in A are more fundamental.*

This principle means that we cannot use the less-fundamental facts to explain the more-fundamental facts. Fundamental facts should be ontologically prior. Note that fundamentality itself is by no means a clear notion. Some philosophers associate it with a primitive notion of *grounding* (Schaffer 2009); some use the term "*independence*" (Cameron 2008) to capture the notion, while others express similar ideas by replacing the notion of "grounding" with "truth-making". Fortunately, most authors in the literature seem to agree that the relation of "being more fundamental" is transitive, irreflexive, and asymmetric, and that we can have a good and intuitive grasp of this notion by experiencing various examples. In our context, we hope to give two characterizations of fundamentality, one in terms of *structural simplicity*, and the other in terms of an *order of explanation*.

First of all, we take fundamental entities to be simple enough in structure. An entity is *structurally simple* if it is an entity that enters into relations with other entities *solely in virtue of itself*. For instance, the *property* of a red apple is structurally simpler than the red apple (as a "thick particular"), because the red apple enters into the relation of, for instance, causality, *in virtue of* its properties, which are not the apple itself. Because the red apple is constituted by those properties, in

terms of structure, it is not simpler than its properties. So, *in that sense*, we say the property is *more fundamental* than the apple.

Likewise, *if we assume* that events are identical iff they occur in the same space at the same time (arguably, events are complex entities; if they contain spacetime points as constituents, then spacetime points are structurally simpler, and hence more fundamental), then an explanation which uses the fact that there are two events (the more complex entities) to explain the distinction of the space and time points (the simpler entities) would not be acceptable: according to the definition of event in that context, the two complex events are distinct *in virtue of* the distinction of their space and time points, not *vice versa*.

Secondly, other than structural simplicity, the other key feature for something's being fundamental is that it plays an essential role in ontological *explanation*. In this sense, fundamentality is always associated with the notion of explanatory *priority*: the facts we are looking for do not only give the sufficient and necessary conditions for the fact that the spheres are distinct substances, but also *ontologically explain* the distinction.

For example, the fact that the two singletons {Socrates} and {Plato} are distinct cannot explain the distinction between the two philosophers, even if it gives the sufficient and necessary conditions of the distinction.[46] Plato is not only fundamental in the ontological *structure* sense (he is simpler than his singleton, and his singleton (at least per some theories of sets) contains him as a constituent), but also *explanatorily prior* in the sense that we cannot understand of the singleton *of Plato* "before" we understand Plato, and we do not need to know what a singleton of Plato is in order to know who Plato is. Plato's *essence* cannot be given from his singleton. Such a "singleton solution" to explain the distinction of Plato and Socrates breaks principle 7 because the singletons are not explanatorily prior to the philosophers themselves.

Being explanatorily prior and being structurally simple, as two dimensions of the notion of fundamentality, should lead us to the *same* destination. Reasonably, these two dimensions should rise and fall together: if something is structurally simple enough, then it should play a fundamental role in explanation. And the fact that something is more often used as an explanation than others may well indicate that it is simpler than other theories: we would not rationally rely on less simple things to explain the simpler ones.[47]

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[46] The case was originally made famous by Kit Fine (1994), but we are using it to make a slightly different point.

[47] In practice and history, it is possible to find some explanation which later turns out to be ontologically more complicated than the thing being explained, but if what we said here is correct, that only shows the original explanation is misleading and we *should* give up the original explanation and find a better one instead. Also, we will *not* consider what Barnes (2018) calls the "symmetric dependence" because she does not define "priority" in the same way as we do. Even if there might be cases where dependence and grounding should be separated, and where symmetry of explanation can be accepted, clearly, in our characterization, whether something is structurally simpler than the other cannot be symmetric.

There are many other reasons this proposal goes wrong: it cannot explain the *indivisibility* of Socrates or Plato (P5): how do properties like humanity, rationality and origin relate to the identity of Plato? Also, it has a very *limited* applicability which cannot be extended to other ordinary cases (P6): for instance, not everything can have a singleton: it is commonly agreed that "everything" itself cannot. Besides, it faces the "Revenge Problem" in accounting for the distinction of the singletons (P7): if the two things are distinct because of the singleton, then what makes those singletons themselves distinct? Nothing in the nature of a singleton could make it explanatorily simple…

These observations suggest that our principles are intimately connected and well supported by each other, which greatly increases their reliability—even if when considered in isolation each principle may not seem very strong. Once their inter-connection is demonstrated, they become a powerful guide in solving the Problem of Distinction.

5.　Concluding remarks

Part 3 (B) of this chapter has laid out eight principles to evaluate the proposals to solve the Problem of Distinction.

Definition

[P1]　*An explanation A of a distinction fact must provide the sufficient and necessary conditions for the distinction fact.*

No Conceptual Circularity and Triviality

[P2]　*An explanation A of a distinction fact cannot have conceptual circularity and familiar triviality.*

Non-circular Individuation

[P3]　*An explanation A of a distinction fact must look for entities from a **distinct category**.*

Reliability of Distinction

[P4]　*If both fact A and fact B can give an explanation for fact C, where C is a fact of distinction, then ceteris paribus A is a better explanation than B if the distinction of A and C is less controversial than the distinction of B and C.*

Indivisibility

[P5]　*An explanation A is better than B in solving the PoD if, ceteris paribus, A not only solves the Problem of Distinction, but also solves the Problem of Indivisibility.*

Generality

[P6]　*An explanation A is better than B in solving the PoD if, ceteris paribus, A not only solves the problems in symmetrical cases, but also non-symmetrical ones.*

No Revenge

[P7] *An explanation A is better than B in solving the PoD if, ceteris paribus, A faces fewer revenge problems than B. That is to say, the same form of the PoD would not reoccur within the explanation.*

Priority

[P8] *An explanation A is better than B in solving the PoD if, ceteris paribus, the entities involved in A are more fundamental.*

Some of the above principles (1 to 3) are mandatory: they forbid logical incoherence. Other principles are metaphysically and theoretically desirable:[48] they are used to make a theory *better*. The aim of doing this is to make our later explorations more efficient. It should not be supposed that those eight principles are exhaustive and exclusive to each other. They have to work together according to different cases. It is always the case that a proposal could fail because of its breaking more than one principle.

There might be a gap between accepting the principles and putting them into *use*. It is possible that, for instance, even if we agree that simplicity is a good feature, how to attribute this feature to different theories is still not straightforward. Also, it would be hard to make a choice when two theories obey different principles. Instead of giving further "principles of principles" to prioritise them, let us move on to the detailed solutions; issues of prioritisation of these principles will figure in future chapters.

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[48] This may remind us of the descriptive/revisionary distinction made by Strawson (1959).

Chapter 4
Against Three Positive Solutions

We have clarified the nature of the Problem of Distinction (PoD) and set up principles of evaluation for any solution. We have also given our own classification of the solutions in the literature according to which there are two kinds of solutions to the PoD, the positive and the negative. The positive ones explain the distinction of Black's spheres by reference to various entities or theories. The negative ones in some way "deny" our interpretation of some of the data which the positive solutions to the problem try to explain. As explained in the last chapter, from now on we will mainly use Black's spheres as a starting test case.

This chapter has three main parts. It argues that the three representative positive solutions, via spacetime points (Part A), bare particulars (Part B), and tropes (Part C), are all unsatisfactory in solving the PoD based on the principles of evaluation. Let us begin with the solution via **spacetime points**.

(A) Spacetime Points

One intuitive explanation for the distinction of Black's spheres is to say that they have distinct locations or places at a time: *sphere* x *and sphere* y *are distinct if* x *and* y *occupy distinct places.* Similar views could be found in Locke[49] (1828) and Campbell (1970). Even for non-philosophers, this solution sounds natural: most of us rely on spacetime to differentiate things in ordinary life and we may take the primary objects of reference to be positions (Quinton 1973, p. 46).

Section 1 summarizes some key positions on spacetime in the literature; Section 2 argues that (most versions of) the spacetime points solution cannot explain the general cases of distinction and faces the revenge problem; Section 3 argues that the solution is not necessary for explaining the distinction of substances. Section 4 is a conclusion.

1.   Preliminary notes: Some theories of spacetime

Before scrutinising the solution, we should set out some preliminary notes on the nature of spacetime. Although we cannot enter into a detailed discussion of every theory of spacetime here, it would still be helpful to survey the various theories of spacetime in general. We will consider two aspects of the relevant thought. The first aspect concerns the dependence relation between material objects and

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[49] Locke is careful to say that two things of "the same kind" cannot be in the same location. But on what grounds a particular belongs to a certain kind is left completely unclear; and here we do not assume a strong notion of kind anyway. As MacDonald (2005, p. 59) argues, even if there is only one kind of entities in reality, the Problem of Individuation (Distinction) remains. Also, Locke does not seem to have a notion of spacetime (as a whole), but our argument will still work for spatial locations.

spacetime; the second, which is related, concerns how to understand material objects and spacetime in the framework of a two-category ontology.

1.1 Dependence and individuation via spacetime

Most discussions of the nature of spacetime begin by asking: What is the relationship between the material object (body/matter) and spacetime? **Substantivalism** holds that spacetime is one sort of substance, which is basic and independent of anything else. By contrast, **relationalism** holds that spacetime is derivative from relations among material objects.[50]

There are different versions of both substantivalism and relationalism, which we will review later, but firstly we may say that in general the gist of the substantivalism-relationalism dispute is sometimes taken to be about the ontological order of *individuation*: which comes first, objects or spacetime? Secondly, the dispute also has implications for whether the basic constituents of spacetime are 'pointy' or relational. *Usually*, a substantivalist world is a collection of spacetime points, while a relationalist does not have to believe in a 'pointy' spacetime.[51]

Thus, if we focus only on individuation, there are two levels of individuation here: one level is a choice between material objects and spacetime; the other level is within spacetime itself: we should not only ask whether spacetime is relational or pointy (or whether spacetime points or relations exist), but also how the points or the relations themselves are individuated. Traditionally, main versions of substantivalism not only (1) *use spacetime to individuate objects*, but also hold that (2) *spacetime itself is determined by points, and those points are primitively individuated by something else (like haecceities)*. In contrast, the main version of relationalism rejects both (1) and (2): arguing that spacetime is not pointy, and claiming instead that spatiotemporal relations are individuated by material objects.[52] However, logically speaking we could also have a theory which only rejects (1) but not (2), arguing that points could also be individuated by their relations: this is the structuralist view (or as Baker (2010) calls it, "sophisticated substantivalism").

The question of dependence and individuation assumes the distinction between spacetime and material objects, but what if we identify spacetime and material objects altogether? This would be the position called **super-substantivalism** (Sklar 1974) or "Cartesian-Spinozean substantivalism" (Esfeld

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[50] According to some theorists, the substantivalism-relationalism distinction matches the distinction between the Newtonian and Leibnizian theories. For instance, Earman and Norton (1987) argue that substantivalists must reject "Leibniz equivalence", according to which diffeomorphic models of spacetime represent the same physical system.

[51] Note the two interpretations are separate. As Paul (2013) writes, "The issues about the nature of the constituents and the issues involving individuation need to be evaluated separately. They are related, but they involve different ontological commitments. One ontological commitment involves the type of spatio-temporally fundamental constituents of the space, namely, points or relations. The other ontological commitment involves the way the constituents of the space are individuated" (2013, p. 106).

[52] Here we are neutral about whether spatiotemporal relations are universals or not. It might be said that universals themselves do not need individuation at all. If that is the case, it only shows that some relationalists of spacetime have to believe in tropes or modes.

and Lam 2008, p. 42): there is one and only one substance, and that substance is spacetime. This position does not need to decide the dependence question between spacetime and the material objects: they are identical! Despite its alleged prestigious history, it is not clear that this radically "monist" view could be helpful in giving us an informative solution to the Problem of Distinction. See below for some evaluations.

To sum up, the above theories (substantivalism, relationalism, sophisticated substantivalism, and super-substantivalism) are based on the dependence relationship between material objects and spacetime, and this will be important in evaluating the spacetime proposal in section 2.3.

1.2   Four possibilities within a two-category ontology framework

On the other hand, and more naturally and conservatively, if we assume that spacetime and material objects are two kinds of entities, then within a substance-property category system, we may review the following four positions.

(a)   Spacetime and material objects are two distinct kinds of substances. Schaffer (2009) calls this **dualistic substantivalism**. It might be the case that the two substances are independent of each other, but it is also possible that one substance is *constituted* by the other.[53]

(b)   Both material objects and spacetime are properties. (Paul 2013)

(c)   Spacetime is the only substance and material objects are properties (modes) of the substance. (Spacetime may or may not be more fundamental than the objects.) [54]

(d)   Only material objects are substances and spacetime is a property. (The latter may or may not be dependent upon the substances). If properties depend on substances, this position can be taken to be one version of relationalism of spacetime (provided relations are taken to be property-like) and in that version, the objects are more fundamental than spacetime.

Again, these positions are to be considered from different aspects. They may or may not cut across the substantivalism/relationalism distinction set out in the previous section. The previous distinction concerned the (in)dependence between spacetime and material objects, and it is silent on whether they are substances or properties. Whether, for instance, sophisticated substantivalism belongs to position (a) or not, depends on the ontological category of spacetime and material objects.[55]

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[53] Note that Schaffer classifies the constitution view as one version of his monist (super-) substantivalism, rather than dualistic substantivalism. But for us, it seems unintelligible to call the position a monist one if denies the identity between the objects and spacetime.

[54] Even if we say that objects, as properties or bundle of properties of spacetime, constitute spacetime, it does not follow that the spacetime is not more fundamental.

[55] "Substantivalism" seems to be a misnomer because it does not mean the category "substance".

So, *as far as the two-category ontology is concerned*, and taking super-substantivalism into account, altogether we have five theories[56] on the table about the relationship between spacetime and material objects. Although it is impossible to decide which one is the best here, it would be enough for our purposes if we could identify some shortcomings which are common to all the positions in explaining the distinction of the spheres.

The above classification of the theories of spacetime is based on the assumed two-category ontology. Its utility will be reviewed in section 2.1.

Now let us evaluate the spacetime solution on the basis of our principles as set out in the last chapter. For each case, we will begin by assuming spacetime is pointy because that is the most popular move in explaining the distinction of the spheres, and we consider other variant solutions only when needed.

2.   Category, generality and revenge

2.1   A distinct category from the spheres?

As we will argue, there are many principles of evaluation which the spacetime-point solution fails to obey. To begin with, one principle says that an explanation of a distinction fact must look for entities from a distinct category in order to avoid circular individuation. That is to say, we cannot use entities from the same category to explain the distinction of some given entities: to do so would assume what we are trying to explain, i.e. we have to assume the distinction between the thing being explained and the entities used to explain it.

However, it is not clear that spacetime is qualified to be a distinct category from the spheres. As we have demonstrated in the last chapter, the spacetime-point solution faces the problem of "circular individuation" for the super-substantivalists who hold that spacetime is the only substance. They might say that there is no distinction between the spheres and the spacetime points: the spheres are just spacetime points. Super-substantivalism should be rejected as a solution, therefore, because it does not obey our principle about categories.

Would it be better if we were not super-substantivalist? Recall what we have laid out in the beginning, that there are four main positions which are not super-substantivalist:

(a)   Spacetime and material objects are two distinct kinds of substances

(b)   They are distinct kinds of properties of the same bundles of properties

(c)   Spacetime is the only one substance and material objects are properties (modes) of the substance

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[56] Of course, super-substantivalism simply *identifies* spacetime and material objects. But the resultant entity itself could either be substances or properties. But for convenience, we will take these two variants as one possibility because they are *effectively* the same.

(d)   Only material objects are substances and spacetime is their property

According to position (a), spacetime is distinct from the spheres, but they are both substances, which means that they are of the same category (unless there is another sub-categorical distinction beneath that of substance, but this would contradict our assumption that there are basically two categories). Then the spacetime solution faces circular reasoning: we seek to know what makes two substances two, but using spacetime in (a) to do the job has to assume the distinction of the two substances.

Position (b) is the same because it only changes 'substance' for 'property'. On this view, we will need to explain the distinction of properties by appealing to further properties, which violates the Principle of Non-circular Individuation again.

Position (c) has two problems. Firstly, it only admits one substance, while what we are trying to explain is the distinction of the two substances. It dissolves the problem instead of solving it. What we care about is two spheres *qua* substances, rather than two modes of the one substance. And according to our classification in the previous chapters, this at best counts as a *negative* proposal, which we discuss later. Secondly, even if it can still explain the distinction of the spheres by saying that they are two distinct modes, what does the work here will be *modes* rather than *points* of spacetime. Then this turns out to be a solution with modes (tropes), which we will deal with in Part 4 (C) of this chapter.

Position (d) does not break the current principle. But if should be obvious that under position (d), the spacetime solution still fails for most philosophers who take spatiotemporal aspects, if they are properties at all, to be dependent upon the material objects, according to the Principle of Priority, which says the distinction of the two substances cannot be explained by something will is less fundamental than substances.

So as regards to our second principle of evaluation alone, among the four distinct positions of spacetime, only the dualistic positions (c) and (d) can pass the examination. In order to be successful, the solution must find independent reasons to argue against the other three positions (including super-substantivalism), which makes it hard enough to defend.

2.2   General cases

Another principle says a solution for the sphere case will be preferable if it can also deal with the general cases. Now, it is not hard to see that if the spacetime-point solution can account for the distinction of the two spheres, then the spacetime points can also be used to account for the distinction of a sphere and a cube, or an apple and a banana. It seems the solution can solve *some* general cases.

But still it is not "general" enough in a strong sense, because we should not assume the indispensability of spacetime from the start, and we may argue that not everything has spacetime, or at least clear spatiality in the first place (for instance, consider a piece of music, some political ideologies and social entities). We may even have non-spatial indiscernibles such as angels (this is important for medieval thinkers like Duns Scotus and Paul of Venice. For modern discussions, see

Armstrong 1983, p. 160), Cartesian souls, and more importantly, two complex numbers and two sets, and so on.[57]

2.3   The Revenge Problem: The individuation of spacetime points

The spacetime-point solution faces the revenge problem. That is to say, even if we can appeal to locations to explain the distinction of the spheres, the distinction of those spatial points themselves needs explanation. It needs a theory to account for its own individuality.

If we hold that spacetime is dependent upon the other substances, then the points have to be individuated by reference to their substance bearers. But this will render the spacetime explanation for the spheres' distinction circular, so it seems that to individuate the spacetime points non-circularly, two choices are left. Recall what we argued in the beginning of the section, that there are two types of individuation problem: the first is about the individuation relation between the material objects and spacetime, and the second is between spacetime points and other spacetime constituents like relations. (For super-substantivalists, as we said, the two questions automatically merge into one.) If we give up the dependence which the points have on material objects, then naturally we will either individuate spacetime points by their haecceities, or be a "sophisticated-substantivalist"[58] who holds that spacetime points exist but lack primitive individuation: again this is the structuralist view. In either case, spacetime points are not the most fundamental entities we are looking for.

Again, it is worth noting that some of our principles of evaluation are mandatory, the breaking of which means a solution fails decisively, while others are simply desirable, and show the limitation of a solution in comparison with others. Philosophers who adopt the spacetime-point solution may well agree that they need a theory of individuation. But if such a theory which is supposed to be more fundamental is found, then it will make the spacetime-point solution *redundant*, even if not wrong. Thus, according to the Non-revenge Principle which says the same kind of PoD should *not* reoccur for spacetime points themselves, we do not argue that the spacetime-point solution is wrong; rather, it is very limited in that it does not itself deliver a complete explanation.

In spite of the fact that the spacetime point is not a good solution to the PoD, certain versions of it may be regarded as a good argument for the realism of haecceities, because haecceities may well be needed for the individuation of spacetime points, even if believers in haecceities do not have to appeal to the spacetime points' individuation specifically. For the purpose of the thesis, we will not

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[57] Even if we can put the problems of abstract entities aside for the sake of our argument, we still need to account for the material constitution itself: what distinguishes the statue from the clay? Sometimes we have coincident but distinct entities which do not differ in their persistence conditions. Hence, even if spheres cannot be co-located and the spacetime-point solution does not need to be non-necessary, it still shows an obvious limitation when we evaluate it from the perspective of our current principle. It would be replaced by a solution which can solve both the special cases and the general cases including material constitution. Haecceity theory's answer to this is simple: the two things have distinct haecceities.

[58] Rickles and French (2006) claim that the "sophisticated" substantivalism and a popular version of relationalism both collapse into spacetime structuralism. We are neutral about this position.

discuss this issue because our main argument is based on the distinction of substances, no matter whether spacetime points are substances or not.[59]

Returning to the PoD, what we have argued in this section is that, firstly, the solution via spacetime points cannot solve the general cases of distinction such as cases of material coincidence and other non-spatial entities; and secondly, even if spacetime works to explain the distinction of the spheres, their own identity and distinction needs further explanation as well. The solution thus faces the revenge problem. This problem might be solvable if we believe in haecceities or structuralism; but if any other theory faces less of a revenge problem, then the spacetime solution should still be replaced.

3.   The distinction-fact of the spacetime point (STP) is not necessary

We have argued that the spacetime point solution (STP) violates the principles of category, generality and non-revenge. This section will argue that there is a further and perhaps more acute problem: it is (at least) not necessary.

According the first principle of evaluation, an explanation of a distinction fact must provide the sufficient and necessary conditions for that distinction fact. Does STP meet this requirement? It seems sufficient in some cases: if substances x and y are in different locations, then x and y should be distinct. One worry here is that we have to assume that one entity can only have one location at a time. But most ordinary objects have extension and various parts which are located in different places, and these parts may even be spatially scattered and not continuous. What is the location of the sum of the Moon and the city of Durham? This might be enough to show that the solution is unsatisfactory: it is nonsufficient![60] (See Chapter 8 on humility of haecceitification on the possibility of scattered substances.)

However, here we will focus on a more serious problem. Even if the solution is sufficient in a very ideal sense, as we will argue, its necessity is far from clear because it is hostage to the fortunes of controversial positions in the debate about material constitution. In fact, the solution depends on whether colocation is possible: the spheres are distinct, but from the mere fact that x and y are two spheres we cannot be sure that they occupy different locations. In *conceiving* the situation, following

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[59] The main argument for using haecceities in spacetime individuation can be seen in Karenen (2001) and Wuthrich (2009). The idea is that unless haecceities are introduced, all the Euclidean points would collapse into one single point because of their symmetrical nature. One main argument against this is the Hole Argument (see Norton 1988, Dorato 2000, and Stachel 2006): it tries to show that if the existence of haecceities of spacetime points is accepted, then it will make physics indeterminate because we could have many equivalent descriptions which only differ in their positions in the spacetime manifold. But from the haecceities point of view, the kind of "determinism" found in physics does not have to, and should not, include all the aspects of reality. For the believers in haecceities, defining determinism in such a way that everything is physically accessible and determined is question-begging.

[60] A possible remedy here, similar to what most physicists do, is to develop a theory of location which allows us to talk about one single *idealized* location of even scattered objects. In physics, most objects are taken to be pointy with a centre of mass. But how to put this idealization to work is far from clear.

Kant, it might be the case that we have to put the two spheres into two locations, but having different locations is not a necessary condition for the distinction of the spheres. In other words, it can be argued that *co-located spheres* are theoretically possible.

An argument will be given and defended below. Before going into our argument, though, we should acknowledge that dismissing the possibilities of co-locating spheres from the start merely because it is counter-intuitive is not reasonable. Is the very idea of co-located spheres intelligible? Some find it absurd. For instance, Rocca (2005) makes the complaint rhetorically,

> Is the 20-sphere case possible? It seems absurd to say that it is. Just ask yourself: is it really possible that what is apparently one sphere on my desk is actually 20 completely overlapping spheres? This scenario violates what is apparently a conceptual truth to the effect that there cannot be distinct indiscernible things that occupy precisely the same location at all the same times and have all the same parts.[61] (2005, p. 486)

But what is the argument here? Why is it an "apparent conceptual truth" that there cannot be co-located spheres? Clearly, we cannot decide this merely by our armchair intuitions: these do not always deliver "apparent" truths at all, even if they can sometimes be valuable. It was apparent for the ancient Greeks that the heavier falls quicker, and it was apparent for people in the pre-Einstein era that things can have different relative velocities to light. Unless *any positive reasons* can be provided to resist the possibility of co-locating, we may take the idea of co-located spheres to be natural and intelligible. The space of possibilities cannot be cut down arbitrarily. But in fact it is not clear whether philosophers like Rocca have any positive reasons for their position except that feeling of absurdity.[62]

By contrast, it seems there are some considerations which *force us* to admit the possibility of co-location. One of the central arguments we will give goes like this:

(1)   The standard account of material constitution is correct

(2)   If the standard account is correct, then co-located spheres are possible

Therefore,

(3)   Co-located spheres are possible

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[61] Strictly speaking, it is not right to say that the spheres have the same parts. Firstly, the proposal we are discussing assumes that spheres are pointy-like, otherwise it would not be simply symmetric: some parts of the spheres would be discernible from other parts because of their distinct relations to the whole sphere. Secondly, even if having parts will not influence the symmetry, the co-locating spheres only requires spacetime sharing, because it is possible to say that those parts are co-located as well. Hence co-locating does not violate the extensionality of mereology which says that two things having the same parts are the same: because they at most have co-located parts, rather than the same sets of parts. For other replies to Rocca, see Jeshion (2006) and Cross (2011).

[62] As far as I know, one important attempt in this direction was explored by Leibniz, who held that there is a further property which he called *antitipy*, which is the "essence of matter" (Woolhouse 2010, p. 61), to explain the spatial exclusion (a remarkable contrast with Locke). No matter whether this works or not, at least it is far from being a conceptual truth.

The argument is valid. Let us have a closer look at the premises.

3.1   The Standard Account of material constitution

To begin with, it should be acknowledged that our aim in this section is not to conclusively defend the standard account and refute other options, but to raise enough doubts about other accounts to show that the standard account is a genuine contender, in which case the spacetime point approach needs to take it much more seriously.

The puzzle of material constitution has various versions. One famous case is that the of the statue and the clay. Suppose we have an unformed lump of clay C at time t_1, and then sculpt it into a formed statue S at time t_2. Then we ask: at t_2, what is the relation between C and S? At first glance, there is only one thing there: S just *is* C. But a problem now arises: S and C seem to have *different properties*: C exists at both t_1 and t_2, while S only exists at t_2; C can continue existing after S is squashed. A statue needs certain *shape* while the clay does not. More accurately, it is the essence of a statue that it has a certain shape, while it is not the essence of a lump of clay. According to Leibniz's Law, S and C have different (essential) properties, so S is not identical with C. Therefore, at t_2 there are two material objects co-located: two material objects can exist in the same location at the same time.

This result is puzzling because for many, repeating the Lockean idea, it is "a truism frequently called in evidence and confidently relied upon in philosophy that two things cannot be in the same place at the same time" (Wiggins 1968, p. 90).

A lot of replies to the appeal to this 'truism' are to be found in the literature. But the one we agree with here is a very widely accepted view (just to name a few of those who accept it: Kripke 1971, Lowe 1983, 1995, Fine 2000, 2003, Simons 1985, 1987). This is to embrace the conclusion of co-location and hold that constitution is not identity: the statue is constituted by the clay, but has different properties from it. Burke (1992) calls this "the *standard* account".

The standard account is clear and straightforward:

(4)   C (clay) exists at both t_1 and t_2

(5)   S (statue) exists at t_2

(6)   According to Leibniz's Law, S and C are distinct and co-located at t_2 [63] [64]

Unsurprisingly, there are various non-standard positions to be found in the literature. But our point is simply to show that not every serious thinker would like to pay the cost of, for instance, denying absolute identity or the existence of ordinary objects (see footnote 66 for some detailed worries). That is partially why the account that there are two things co-located is supported by many philosophers and called "standard": going beyond it is much harder.[65] [66] The only price the standard account needs to pay is to give up the Lockean intuition of spatial "exclusion". And again, physics, for instance, has demonstrated many times that our intuitions can be fragile, especially in the case of spacetime.

It suffices to say that the standard account is a well-established position, or at least a genuine metaphysical possibility. And it is not merely a "self-contained" possibility: it is a position we *have to* take by considering the argument above—it is based on the observation that the two things have

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[63] Note that we do not rely on the assumption that *existing at a time is a property*, and we take no position on the Lewisian problem of temporal intrinsics, because there are cases of material constitution which do not have temporal differences at all—like Gibbard's (1975) Lumpl and Goliath: an artist can divide a given statue into two halves, and then put them together in order to make a new statue and also a new lump of clay (because it results from two lumps of clay). In this situation, a new statue (Goliath) and a new lump of clay (Lumpl) begin to exist at the same time. They are *historically* indiscernible. In this case, other properties might be invoked. For instance, both Fine (2003) and Baker (2000) argue that the two things have distinct *aesthetic* properties: only the statue is admired and reviewed by artists.

[64] This may seem to be at odds with the exposition in Chapter 2, where we argued against using properties to explain the distinction. But the argument there is just that we cannot explain the properties-distinction non-circularly in some cases. It does not say that no property distinction, when well established, cannot imply any distinction of objects.

[65] This does not mean all philosophers reach the standard account in the same way. For instance, even if you are a four-dimensionalist about persistence, you would also say that at t_2, S and C are co-located: they share some temporal parts. But the co-locating conclusion will not be changed if we do not believe in temporal parts at all.

[66] Basically, there are two ways to reject the standard account: Eliminativism or Modifying Leibniz's Law. The former denies the existence of S or C, and the latter makes the argument invalid. Eliminativists include Unger (1979) and Van Inwagen (1990). They deny that there are any composite objects. To alleviate the incredulous stare, they make an ad hoc distinction between "loose speaking" and "strict speaking". Loosely speaking, there is a statue, but strictly speaking, the statue is just a statue-wise arrangement of particles (or simples). But what is "arrangement"? Arrangement by definition is something having parts. Secondly, eliminativists have to assume a world with material simples, which is incompatible with the possibility of a gunky world, where absolutely everything has a part. Finally, even if the ordinary objects do not exist, we still need to save the phenomena! We still can ask questions about the relations among those non-existent entities. Judging them to be non-existent does not solve the real problem at all. On the other hand, Geach (1967) holds that identity is always kind-relative: it is not right to ask whether two substances are absolutely distinct or not. But this is by no means an easy route to go down. Firstly, relative identity theorists must offer us a replacement for Leibniz's Law and a consequential amendment of everything in logic and semantics which assumes absolute identity. Secondly, it does not work for many other cases of material constitution where the two things are of the same kind (for instance, in the Ship of Theseus, all the entities we have in the picture are ships). The worry may also be applied to other effectively similar approaches like the *qua* theory or the inconstancy theory.

different properties.[67] [68] In order to reject this position, it seems a theory *has to reject* some of these highly attractive premises from 4 to 6, by being, for instance, an eliminativist or going for relative identity. All things equal, theories which are compatible with this possibility should be preferred. The denial of the possibility of our standard account would be a big price for any theory. To make other non-standard positions plausible, the spacetime-point solution to the PoD has much more to do.

Thus, the first premise of our central argument in this section should be accepted. Now the question is how to carry the lesson over to the spheres case, which is seen in the second premise.

3.2   Statue, clay, and spheres

Why should we spend time discussing material constitution? At a first glance, the co-located spheres and material constitution are not the same. It seems a given fact in the literature that philosophers who talk a lot about the statue-clay case and those who talk a lot about the spheres case *work independently*. But that independence reveals nothing philosophically significant. Interestingly, although against the co-locating of spheres, Rocca does say: "I am neutral on whether, for example, a statue and a non-identical lump of clay can occupy precisely the same place at the same time" (2005, p. 486).

However, if we do have a position on whether two spheres can be co-located, the neutrality cannot be maintained: the statue case and the sphere case are intimately connected. This is the meaning of our second premise: the co-locating of the statue and the clay and that of the two spheres *have exactly the same structure*. If the standard account is accepted, then the two spheres can be co-located.

The reason is simple: a statue and its clay can happen to be spherical! We can have a statue-sphere and a clay-sphere: if the spherical statue and the sphere-shaped clay are distinct but co-located, then why can we not directly describe the situation one in which two spheres are distinct and co-located? The argument may be formulated as follows:

(7)   A spherical statue is a sphere (call it the statue-sphere)

(8)   A spherical lump of clay is also a sphere (call it the clay-sphere)

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[67] Note the argument only shows it logically follows from the premises that the two things are distinct. It does not make the claim that those different properties are ontologically more fundamental than the distinction of the statue and the clay. Hence the popular **Grounding Objection** (how could two things sharing physical properties differ in non-physical properties if the latter is grounded in the former) could be misleading here. There might be a genuine puzzle of grounding there, but it does not undermine the argument that the two things are distinct.

[68] One quick worry here is that, even if the statue and clay are distinct because of properties, this cannot be applied to spheres because spheres (see below) are supposed to be qualitatively indiscernible. But note in advance that the argument below is only that the situation of the spheres' colocation can be reached from the statue's colocation via continuous transformation. "If *p* is possible, then *q* is possible" does not mean *p* and *q* must be possible *for the same reason*. Moreover, if things have haecceities, the collocating of spheres are still a case of distinction by *properties*.

(9)   If the standard account is correct, the statue-sphere and the clay-sphere are distinct but co-located (for instance, only the statue can cease to exist when being squashed)

Therefore,

(10)   If the standard account is correct, there are two distinct spheres co-located

Thus, according to the standard account of material constitution, two spheres can be co-located.

Further, the co-located spheres are not only intelligible in our actual world. Arguably, they can even make sense in a world similar to Black's world. Consider a god with artistic intentions who creates a spherical statue and *nothing else* (in the same sense as when we say a god could create a Blackian universe). Call the statue-universe which a god could have created *a lonely universe*, then this lonely universe will be similar to the universe of Blackian spheres. In that case, compare the statue in the lonely universe and *one* of the two Blackian spheres: they are *extremely* similar, especially when we suppose the statue the god-artist created happens to be a sphere of *the same size* as Black's sphere, and especially if we suppose that the Blackian sphere is made of clay (rather than iron, as originally assumed)! Then, the co-locating spheres could be treated exactly like the statue in our actual world. Firstly, the statue and the clay in the lonely universe may be *as indiscernible as* the spheres. Secondly, the spheres in the actual may be *as discernible as* the statue and the clay.[69]

Indeed, this corresponds to what we argued in previous chapters, that the *general* cases of distinction and the *special* cases of distinction are equally significant. In our actual world, we have the general case and find various relational properties and intrinsic properties to explain the distinction; while in the lonely universe, we have the special case. Part of the reasons that these two kinds of case of distinction should be treated equally, as we have seen, is that there is a continuity transformation between the two situations where the identity of the things is untouched.

Therefore, the second premise should be accepted as well. If the standard account is correct, then the co-located spheres are possible. Systematic thinking does not allow us to be neutral about the statue case when discussing the possibility of the spheres, as Rocca seeks to be. Again, "is it really possible that what is apparently one sphere on my desk" is actually two completely overlapping spheres? Now our answer would be, "yes!" The *apparent* one sphere is *possibly* two co-located spheres.[70]

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[69] The statue in the lonely universe also reveals that the notion of a *kind* is redundant for understanding the constitution relation between the statue and the clay. This particular statue and this particular lump of clay are distinct: whether they belong to distinct kinds is not pertinent at all. (Cf. Pereboom's (2011) idea that even a mental token (not type), could be realized by a physical token.)

[70] Note that we do not say that we "know" the accurate number of co-locating spheres. It could be many, or it could be one. In practice, there is no doubt that it is convenient to take there to be only one sphere (because other spheres are causally indiscernible). But this is at most an epistemic point. Likewise, the arbitrariness worry (Sider 2001) for the standard account should not be a problem provided the arbitrariness is epistemic. Lycan's (1994) "Agonostic Haecceitism", Jackson's (1998) "Kantian physicalism", Langton's (1998) "Kantian humility" and Lewis's (2009) "Rasmeyian humility" all advocate a world which is tolerant to this gap between epistemology and metaphysics. (For instance, what our experience tells us is the casual structure of the universe,

Finally, we should not forget that the statue case is one of many co-located cases. We will cover these later, along with other considerations.

3.3   A conclusion based on the first principle of evaluation

Now the premises of our central arguments should be accepted. The standard account of material constitution is a defensible position; and one can use the statue-clay cases as a way of making sense of there being two co-located spheres. So, it can be concluded that co-locating of two spheres is possible.

If the co-locating of spheres is possible, then having distinct spacetime points would not be necessary for there being distinct spheres. According to our first principle of evaluation, no matter whether the problem of generality and revenge can be dealt with (as we argued in Section 2), the spacetime-point solution still fails. Failure in explaining all cases of distinction shows its limitation, but its failure in providing a necessary condition is more serious.

4.   An interim conclusion

Part 4 (A) of this chapter began by teasing out a variety of positions about the nature of spacetime, and then used those positions as a framework to evaluate the spacetime-point solution.

The solution was evaluated according to some of the principles of evaluation we set out in the last chapter. It was argued that spacetime points and the spheres are not clearly drawn from distinct categories, and that the solution is not general enough and faces the revenge problem, although it might be compatible with haecceities. Then, it was argued that the solution is not necessary for the distinction of the spheres. On the one hand, we argued that the co-locating spheres are on a par with co-located material objects like the statue and the clay. On the other hand, the reasons for taking co-locating spheres as absurd are not convincing.

It turns out, then, that there is no version of the solution that can pass the test of all those principles, even if some versions are better than others under some of the principles.

Now we can tentatively reach the conclusion of Part 4 (A): it seems that using spacetime points to account for the distinction of the spheres is not promising. Even if it works for some special cases, its applicability is very limited. We therefore move on to the next representative positive solution, bare particularism.

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rather than what stands in the causal relations. Most philosophers who do not like this gap are structuralists.) And the idea of humility will return again when we discuss the fallibility of knowledge of haecceitification in Chapter 8.

(B) Bare Particularism

In Part 4 (A) of this chapter we argued that the distinction of substances cannot be well explained by the distinction of spacetime points. Part 4 (B) continues the argument against the proposal to use bare particulars to explain the distinction of two substances.

Section 1 introduces various theories of bare particulars; Section 2 argues that bare particularism violates the principle of category-distinction and faces the revenge problem about their own individuation; Section 3 argues that bare particularism may also get the ontological priority between substances and bare particulars wrong; Section 4 mentions other minor problems of bare particularism which make the position even less attractive compared with haecceity. Section 5 is a short conclusion.

1.   Bare Particularism

In this section we outline some of the basic doctrines of bare particularism and argue that certain forms of the theory should be preferred. It is important to note that we are not bare particularists, and here we are just considering what its most ideal form would be like. In later sections we will argue that bare particularism should still be rejected compared with haecceity theory.

Bare particularism is usually taken to be a kind of "constituent ontology" (see Wolterstorff 1970, Yang 2018) which takes substances to be complex entities constituted by properties and bare particulars. (Sometimes the bare particular is also called the "substratum"; it is Locke's "I know not what", and many also refer to it as the "thin particular".)[71] [72]

Bailey (2012, p. 32) identifies two central theses of bare particularism:

The Constituent Thesis: every substance has at least two kinds of (proper) constituents: properties (as its parts),[73] and its bare particular (property-subject)

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[71] Locke scholars have debated whether his substratum is just bare particulars; Armstrong uses the term "thin particulars" in developing his ontology of state of affairs, which he calls "thick particulars": it is not clear that he would also say that a substance has a thin particular as a constituent, but for the sake of argument we will assume those terms are interchangeable unless otherwise suggested. Recent bare particularist positions can be found in Moreland (2001), Sider (2006), Wildman (2015) and Connolly (2015).

[72] Bergmann, the inventor of the term "bare particular", held that the bare particular is only *momentary*. The *Blackwell Dictionary of Western Philosophy* (2004) defines "bare particular" as follows: "The difference between a basic particular and the usual notion of substance is that it is momentary rather than continuing." As Park says, "The bare particular seems to be momentary in the sense that it exists only in one instance of time. On the other hand, a material substance individuated by haecceities is a continuant. So, as long as haecceities secure the identity of a substance through change, haecceities seem to be a continuant as well" (1990, p. 394). Perhaps Park is making a point about persistence and saying that haecceities, as properties, are "atemporal". But we take these to be historical accidents and today's bare particularists can simply reject that narrow definition.

[73] In the literature, a distinction is usually made between a mereological part and a non-mereological part (Armstrong 1988, 1997). But as will become clearer, we hold that these two notions can be treated together with a more liberal notion of part, according to which a *property mereology* can be defined (Paul 2002). See Chapter 7 on haecceity mereology.

The Having Thesis: every substance has its properties by having constituent properties that are instantiated by another of its constituents: its bare particular (property-subject)

Let us have a closer look at these two theses.

The Constituent Thesis

The Constituent Thesis is accepted by many; but there are exceptions. For instance, Connolly (2015) argues that bare particularism should not accept a constituent ontology, and claims that the particular is "bare" in the sense that there is nothing in it that makes it is impossible to have any properties we please (cf. Mackie 2006). Particulars always have some characters, but no fixed ones.

Hence Wildman (2015) distinguishes *one-thingist* bare particularism from *two-thingist* bare particularism. *One thingism* (Connolly 2015, Garcia 2014) denies the constituent thesis, and holds that the bare particulars are identical with the particulars (substances). The particularity of a particular is simply itself. There is no distinction, metaphorically, between the "thin" particular and the "thick" particular.

Two-thingism, by contrast, holds that the two things, the bare (thin) particular and the (thick) particular, are distinct. For instance, Martin (1980) distinguishes the "small" substance from the big "Substance". The small substances are things like apples or bananas while the big "Substance" is specially used to mean Locke's substratum, namely, what we mean by "bare particular". (See more in section 3 below.) Also, Armstrong (1997, p. 109) says, "I speak of the particularity of particulars, rather than just particulars, because we ought to be cautious in identifying the particularity with the particular itself". Here he takes *particularity* and *particular* to be non-equivalent.[74]

As Wildman argues, two-thingism should be preferred if we do not want to distort the meaning of "constitution": if bare particular is a constituent at all, it should be a *proper* constituent. This is because what "one-thingism" really has in its ontology is not an extra portion of reality *besides* the particulars. The only admitted fact for one-thingism is the *bareness* of a particular, rather than an extra particular, a bare, relatively thinner particular of a relatively thicker particular. Hence within one-thingism there is no ontological sense in which the real bare particular is a *proper constituent*.[75]

Moreover, two-thingism should be preferred over one-thingism because, out of these two positions, only two-thingism can provide an interesting solution to the Problem of Distinction. If we believe in the one-thingism version of bare particularism (if this is not a misnomer at all), then saying the two particular spheres are distinct because there are two bare particulars would still sound like a

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[74] How to interpret Armstrong is debatable. Sometimes he says bare particularism is a result of partial consideration or abstraction, which sounds less realist than most bare particularists. But it seems still right to call him a two-thingist because most one-thingists would not even talk about a *distinct* bare particular in thought.

[75] It may be natural to take one-thingism as a nominalist position in that it takes the thickness of particulars to be primitive and holds that no further analysis can be given for the structural complexity of a particular.

primitivist stance: because all it says is that the two qualitatively indiscernible particulars are two because there are two particulars.

Further, for most bare particularists, bare particulars are said to be "characterless". Bare particulars are also fundamental and ultimate. Different bare particulars are primarily distinct. Then we face the very old but important question of clarifying this notion of *characterlessness*. We will come back to this later (see Section 4.1).

The Having Thesis

Now the two-thingism version of bare particularism is understandable and preferred: the bare particular is distinct from the thick particular. But the Having Thesis is still complicated. Bare particularists, even if two-thingism is assumed, differ on the question of whether there is only one kind of instantiation in their theory: for both the bare particular and its substance are said to "have" properties.

A more coherent version of the bare particular theory should not say the relation of "having" is *univocal*, because that would open the theory to the Crowding Objection (Bailey 2009): for instance, a tomato T *has* the properties of being red, spherical and juicy. The bare particular of the tomato T* is said to *have* the properties of being red, spherical and juicy as well. Then we seem to have two indiscernible tomatoes. Even if, as we argued in the last main section, co-locating is possible, we do not have to commit to that *merely because of* this crowding objection. However, holding that both T and T* "have" the same set of properties may make co-locating *necessary* for bare particularists, if the "is" in "T is red" and the "is" in "T* is red" are the same, namely, if there is only one kind of instantiation.

Therefore, a real bare particularist should *not* believe that there is only *one* kind of instantiation (which seems to be another argument in support of the intuition about two-thingism). The instantiation relation between the bare particular and other properties is not same as the instantiation relation between the substance and its properties: in other words, we could draw a distinction between "bearing" and "possessing". The bearing relation is like the relation between my bones and my body: the bones support my muscles, but it sounds incorrect to say that the muscles are possessed by the bone (they are distinct parts of the body!); rather, we should say, the sum of the bones and muscles, the whole *body*, possesses the muscles. Or consider another example: assuming *I am identical with my body*, then both of the two following sentences seems true and assertible:

(1)   I have a head

(2)   I have a computer

For bare particularism, the two "having"s in (1) and (2) should be different. The "having" in 1 means parthood, and my head, as a part of my body (me), is internal to me, while the "having" in (2) means a special bearing relation: I bear a relationship with something external to me, namely the computer.

(That means saying my computer is an internal part of me would be too radical.) The "having" in (1) is similar to the kind of possessing relation between a thick particular and its properties, while the "having" in (2) is similar to the kind of bearing relation between a bare particular and its properties.

Moreland (1998, p. 257), a bare particularist, calls the latter a "tie to" relation and the former a "rooted in" relation. Alston (1954) (though he is not a bare particularist himself) calls them "underlying" and "inclusion": my bone could be something underlying my muscle, but only my whole body can include the muscle. Likewise, the bare particular underlies qualities, but the whole substance, rather than its bare particular, includes qualities as constituents. (So we should not be confused by the verbal dispute: if we reserve the term "instantiation" for bare particulars only, as some philosophers do, then at any rate we still need *another term* to express the relation between the properties and their substances.)[76]

Motivations and virtues

There are two main motivations to believe in bare particulars. One is to account for distinction: for instance, Allaire (1965) says different bare particulars "account for the numerical difference of the things"; the other motivation is to account for the unification of substances' properties or the property-bearing of the substances.[77]

We take both as good motivations and note that these two motivations are similar to what we argued in the beginning chapters: the problem of individuation tries to explain both distinction and unity. But the problem is whether the best candidate to do those jobs is the bare particular.

Now we have outlined the best version of bare particularism which may solve the Problem of Distinction: there are bare particulars, which are distinct from the substances; and a bare particular has a relation with the properties, which is different from the relation between a substance and its properties.[78] According to this position, the fact that the two spheres are two substances is explained by the fact that there are two bare particulars. Each sphere has a bare particular of its own, which

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[76] One tricky objection to the idea of two senses of "having" concerns how to analyse true sentences like "A has a bare particular", if we grant that the apple A "has" redness in virtue of the fact that A's bare particular "has" redness. Davis (2003) argues that it follows from the two senses of "having" that a bare particular must have itself as a constituent, which is inconsistent because bare particulars do not have essential constituents. Pickavance (2009) replies to this by arguing that "having a bare particular" is not the same kind of normal property as "being red". See also Section 4.1 below.

[77] Sometimes it is also said it provides the origin of "concreteness". Also, a third motivation can be added: to semantically account for subject-predicate grammatical forms. Preston (2005) points out there might be a worry for bare particulars because they seem to account for both the unity of a substance and the instantiability of a universal: if these two jobs are done by only one bare particular, it seems mysterious. But this depends on our understanding of universal's instantiation: if it only means being a constituent of a whole substance (thick particular), then there is no serious problem here.

[78] It is also worth noting that bare particularism can take various forms, depending on whether properties are tropes or universals. But the universals version seems better in our context because if tropes are accepted, it seems tropes will be used to explain the distinction. See the next main section on tropes.

makes the sphere distinct from the other. And each bare particular stands in a unique instantiation relation with the properties of the sphere.

This position has some merits. It overcomes many problems the spacetime proposal faces:[79] for instance, if two things can be co-located, then the spacetime proposal would be non-necessary; and if the extended and scattered substances can be said to have many locations, then the spacetime proposal would be non-sufficient. By contrast, these problems can be avoided by bare particularism: on one hand, it is much harder to say two substances can have the same bare particular;[80] on the other, one substance cannot have two distinct bare particulars. The distinction of bare particulars does not violate our first principle of evaluation, which requires sufficiency and necessity.

Unfortunately, there are still some other principles it violates which makes it not very satisfactory. This is what we will argue next.

2.   Which category does the bare particular belong to?

As stated, one of our principles of evaluation says: An explanation A of a distinction fact must look for entities from a distinct category in order to avoid circular individuation. Then our question is whether bare particularism obeys this principle. Various considerations show it does not.

2.1   Bare particulars are still particulars

If we accept one-thingism, which says the bare particular and the substance are identical, then clearly the bare particular cannot be used to explain the distinction of substances. Not only because in that case the bare particular is not from a distinct category, but also because the one-thingism would just turn out to be a version of primitivism: to use the bare particular to explain the distinction of the substances would amount to using the distinction of substances to explain the distinction of substances.

But on the other hand, if two-thingism is true it still faces a similar problem. The bare particular is always said to be "particular", no matter whether it is thick or thin. It cannot be a distinct category. As Rosenkrantz argues,

> It is a necessary truth that a substratum of a particular is itself a particular. Due to the fact that (the bare particular proposal) covers anything which is a particular, it follows that such a bare particular falls under the scope of (the proposal). Hence, since (the proposal) proposes that a particular, *x*, is

[79] For an interesting discussion about the relation between bare particularism and spacetime theory, see Morganti (2011).

[80] If a tomato, as a substance, has a bare particular and there is another thing which has the tomato as a proper part, it still does not give us a case where two *substances* can have the same bare particulars, because if the tomato is a substance, then it would be misleading to also call the thing (the sum) which has it as a proper part a "substance". This is because substances must be independent. The sum of two substances may well exist, but it is not itself a substance. See Chapter 7 on haecceity mereology on a similar point, where we argue that it should be a rule that a sum of two substances itself is not a substance.

individuated by a substratum that supports *x*, (it) confronts us with the strange prospect of a substratum's supporting a particular and this substratum being itself supported by a substratum.

But such a state of affairs is incoherent. An ordinary particular is alleged to be some sort of combination of a substratum and properties. However, since a substratum is 'bare', it seems that there could not be a substratum which is itself some sort of combination of a substratum and properties. Thus, there could neither be a substratum which is supported by another substratum, nor be a substratum which is supported by itself. (1993, p. 99)

If a bare particular is a particular, then we cannot use it to explain the distinction of particulars. Firstly, the distinction between *the bare particular and the (non-bare) particular*, as an instance of a distinction of particulars, needs explanation which cannot be done by reference to bare particulars.[81] Secondly, the distinction between *two bare particulars* also needs explanation, because the distinction between the two bare particulars is also a distinction of particulars. Hence this proposal not only violates the principle of distinct categories, but also faces the revenge problem.

Unfortunately, bare particulars are usually said to be primitively distinct, but saying so is tantamount to another version of primitivism because what we try to explain is exactly the distinction of the particulars. In contrast, if we say the two substances are two because of two haecceities, then because of the categorical distinction between a substance and a haecceity, this explanation is not circular, even if haecceities themselves are also primitively distinct.

Further, even if it is coherent to hold that the bare particulars are primitively distinct, there is a price to pay: namely, bare particularists have to reject the principle of identity of indiscernibles (PII), which says two particulars must be discernible in some aspect. That is because if they do not reject PII, all bare particulars would be in danger of identifying themselves into one because they are indiscernible (they are "bare". We will come back to this in Section 4). So, as some bare particularists agree, PII should be rejected (Sider, p. 287). But then the worry is, if they are *both* particulars, bare particularists must provide reasons for thinking that PII only applies to (thick) particulars, but not to bare particulars. Saying the bare particular is *sui generis* sounds ad hoc.

To sum up, if a bare particular is itself a particular, it is clear that we will be back to some unexplained primitivism.

2.2   Unrestricted composition?

The question about category is more acute for bare particularism when we look at how the categories in their ontology are linked. In explaining his picture of bare particularism, Sider describes his distinction between the thick particular and the thin particular like this:

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[81] It does not help to say bare particulars are from mental abstraction and particulars are not, because that would mean the distinction is not a fact about mind-independent reality at all. Further, that would violate the priority principle. See Section 3 below.

> Call the fusion of a particular and its universals a thick particular. The mereological difference between a thick particular and its universals is what we have been calling a thin particular. All substratum theorists agree that thin and thick particulars both exist. Thick particulars contain their universals as parts, thin particulars do not. (2006, p. 388)

Now the question is this: if we have universals and thin particulars as two categories, then does it make sense to talk about the "fusion" of entities from two distinct categories? As Connolly (2015) asks,

> It makes sense to talk about the fusion of two or more particulars: this item being a further particular. And perhaps it makes sense to talk about the fusion of two or more universals: this item being something wholly abstract. But the notion of the fusion of a particular and a universal makes no sense: what category would such an item belong to? (2015, p. 12)

So, using our own terms, Connolly's point is that the two-thingism of bare particularism makes a "category-mistake".[82] If a bare particular and its universals are the two basic categories we have, then the fusion of a bare particular and some universals would be a cross-category entity. Granted, there *exist* many mereological fusions, as many as we wish, but not all those fusions can be classified into a clear category-system. In having a cross-category entity, the whole point of a category system will be ruined. This is because by saying there are two categories, we begin with a *fixed domain of entities*, and then we *categorize* these entities into various realms, and these realms should be *exhaustive* and *exclusive*. In saying there are two categories, we mean *all* real entities in the world should be either in one category or the other, and these two categories are *all we have* fundamentally. Cross-category entities seem to be redundant and fail to obey the point of categorization at all. Of course, the worry might be dismissed if we *identify* the bare particular with the substance, which is exactly what Connolly argues for. But as we have seen, such a one-thingism will violate our principle of evaluation and most bare particularists should be two-thingists.

In this section, we argued that firstly, if bare particulars are in the same category as substances, then the proposal violates the principle of evaluation which requires them to be a distinct category; and secondly, if we treat categories seriously, two-thingism would commit us to cross-category entities which makes no sense for the very idea of categorization. Now we will turn to another important issue about whether bare particularism delivers the correct ontological priority.

3.   Is the bare particular ontologically prior?

As mentioned, Locke scholars have different interpretations of Locke's substratum (bare particular), but no matter what the details are, in the literature there are two main understandings of substratum

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[82] Again, in the later chapter on haecceities we will show that haecceity and other properties can make some mereological fusions which are of substantial use. There is no worry about category mistakes for haecceities because haecceities are properties.

and partial consideration, but neither can support the ontological priority of bare particulars over substances. If substances are prior to bare particulars, then another principle of evaluation will be violated: namely, the principle which says that a good explanation of the distinctness of substances should *not* use entities which are *less* fundamental than substances. If substances are ontologically prior, then the explanation is not satisfactory.

The first kind of interpretation is one kind of one-thingism: "the substratum of an object's properties is to be identified with that very object. On this account, of course, substrata most certainly are objects and 'self-subsistent' entities" (Lowe 2005, p. 78). The substance and its substratum are distinct in thought, but one in reality.

However, we have argued that if we take properties to be constituents of the substance in a robustly realist sense, then one-thingism is not the version best-placed to solve the Problem of Distinction. Of course, this does not mean that one-thingism could not be what Locke tries to express by his idea of substratum.

The other kind of interpretation is a kind of two-thingism offered by Martin (1980). For instance, he says,

> Locke sometimes uses the word "substance" to mean "object" … Properties, modes and relations, for example, would be something about substances or objects, but not themselves be substances or objects. I shall call this the "small 's'" use. Locke also sometimes uses the word "substance" to mean "substratum". (1980, p. 3)

> The interpretation of Locke's use of the term "substance" that I shall be exploring will be the use in which it may be interchanged with the term "substratum". This is very distinct from the use which means roughly "that which can subsist or exist by itself". (Ibid.)

Under this view, both substrata and properties are dependent entities. They are aspects of the whole substances. Only the small "s" substance (like ordinary objects), rather than the capital S Substance (which is similar to the bare particular), is self-subsistent and ontologically independent. According to Martin, this Substance, the bare particular, is the resultant of our partial consideration: we begin with the entire, thick, substance, then end up with one constituent of it.

If this is how the substratum should be understood, then again it cannot be used to solve the Problem of Distinction: this time, because the bare particular is something we get from abstracting away from a prior substance. If it is dependent upon the substance, then it is hard to say how the bare particular can individuate the substance.[83]

If what we said above is right, then either the bare particular is identical with the substance, or it is dependent upon the substance. The bare particular is something *left after* we remove all the properties of the substance. Thus, it cannot be ontologically prior to substance, and hence another principle of evaluation is violated.

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[83] As Tugby (2015) argues, similar points apply to Armstrongian states of affairs.

No matter how bare particularism might be modified, it is its defenders' task to give us a satisfactory characterization. Before that is achieved, we may take Locke's idea along with the theory about partial consideration as a representative expression of bare particularism. The discussion reveals that the current form of bare particularism is far from complete in explaining the ontological priority of bare particulars. The principle of ontological priority is violated.

4. Bare particulars and haecceities

We have argued that bare particularism, as a solution to the PoD, violates the Principle of Category-Distinction (Non-circular Individuation) and Ontological Priority. Now it would be helpful to show why bare particularism is not attractive *compared* with haecceity theory. We have not yet introduced the notion of a haecceity seriously, but a comparison here would make the job in later chapters easier, because among all these solutions to the PoD we mentioned, bare particularism and haecceity theory are most promising.

4.1 Haecceities do not need to account for bareness

Given that the chief complaint made against bare particulars concerns its consistency, recent bare particularists have focussed "primarily on the issue whether or not the notion of a 'bare' particular is internally consistent" (Morganti 2011, p. 183). The complaint (for instance, Sellars 1963, Rosenkrantz and Hoffman 1997), briefly expressed, is that if a bare particular is bare, if it is something propertyless and which only supports other properties, then it cannot be really *bare*. This can be further analysed into two slightly different worries. Firstly, the theory seems to be *inconsistent* because for some philosophers "being bare" or "being propertyless" *itself* is a property. A bare particular cannot have a property which says "it does not have properties". Secondly, if it seems plausible that *every particular must have some properties*, then bare particulars cannot exist because being bare seems to mean it does not have any property.

These complaints may be replied to in various ways, however. For instance, it may be argued that being bare does not mean something is completely without properties, it only means that a bare particular does not *have* the properties *in the same way* that its thick particular has properties. As argued in Section 1, the former kind of having is "bearing", and the latter kind of having is "possessing". A bare particular is bare because it does not *possess* any property. So, a bare particular is not propertyless after all. It is a property-bearer, rather than a property-possessor. As Baker (1967) puts it, bare particulars are *nude* but not *naked*. They are nude because they are "thin" in themselves, but they are not naked because they are still clothed with various properties.

Another possible way to reply to the inconsistency of bareness is to say that, although it is true to say that in some sense "a bare particular is propertyless", "*being propertyless*" itself is not a genuine property (i.e. nature), rather, it can best be viewed as a way of speaking. The predicate "being propertyless" can be said to be a "property" only in a very loose sense. We can use it to truly describe

the bare particular without making it inconsistent: if not every meaningful predicate denotes a property, then a bare particular does not have *the property of being propertyless*. No such property exists.[84]

All these lines of reasoning are worth considering on behalf of bare particularism. But now the point is that, if we accept haecceity theory, all these problems disappear from the start: because a bare particularist must explain how and in what sense a bare particular, as a particular, can *have* properties. But for haecceity theory, a haecceity and other properties are all properties, and substances are special mereological fusions of these entities.

4.2   Bareness cannot provide the origin of unity

Perhaps we could remain neutral about whether it makes sense to appeal to the distinction between predicate and property in the bare particularist context, and whether the above replies are *ad hoc*. But, more importantly, even if bare particularism is not incoherent *by definition*, its bareness still makes it insufficient to account for the unity of substance because nothing in a bare particular itself can explain the unity of substances.

Why care about unity? First of all, as mentioned, one of our principles of evaluation says that if a theory can solve both the problem of unity (indivisibility) and the problem of distinction, it would be preferred over a theory which cannot. As will be shown in the ontology of haecceity, haecceity is supposed to *haecceitify* certain properties to form substances, and only some possible sums between a haecceity and properties are taken to be real substances, because it *lies in the nature of a haecceity that certain properties can be necessarily haecceitified*. It would be desirable for a bare particular theory if it could also explain the unity of substance, otherwise haecceity theory would fare better.

But an account of unity is more than desirable: it is necessary for any theory of substance to be complete. Here we come to the second consideration. Assuming, as many bare particularists do (see the quotation from Sider in Section 2.2), that a bare particular and some universals can (mereologically) compose a fusion which is the thick particular, then it is natural to ask the bare particularist what makes certain properties, rather than others, the properties of *this* bare particular? What makes the colour redness, rather than blueness, a constituent of the thick tomato and standing a bearing relation with its bare particular? Both the fusion of the property "being a tomato" and the thin particular Tomato, and the fusion of the property of "being a dog" and the thin particular Tomato, exist. But why is only the former fusion qualified to be called the real ordinary tomato? It seems that

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[84] One objection to this strategy is given by Mertz (2003, p. 19), who argues that although bare particularists can say "being simple" or "being a unique constituent of the substance" is not a property, these predicates are nonetheless independent of each other, which means there must be some *complexity* in the bare particulars themselves to account for those different and independent true predications. And further, Mertz points out that one irony is that the predicate "is a bare particular" may be viewed as a conjunction of non-property predicates and hence "being a particular" is not a property and it seems there are no bare particulars. No matter whether this objection is good or not, the point is that the haecceity view does not face such a problem of explaining "bareness".

only in the ordinary tomato, rather than the scattered fusion, is a unity present, and something is responsible for its unity. Unless an account is given, bare particularism is incomplete.

An account of unity is given in Chapter 9, on the modality of haecceitification. We there propose that the relation between a haecceity and its universals is strongly internal (hence necessary). But for now it suffices to say that most versions of bare particularism do not have this necessity component, and the instantiation (the so-called "non-relational tie") between a bare particular and other qualities is contingent, loose and separate, which makes it too weak to do substantial work. Famously, the later Armstrong (2004), a bare particularist in some sense, holds that instantiation is necessary. But the problem is that Armstrong also holds that the bare particular is the result of mental abstraction, so how could an abstraction be *responsible* for the unity of the substance? It cannot. So it is not completely clear *where* the necessity in Armstrong's later ontology *comes from*. It, as it seems to us, may merely be *stipulated*.

If no theory of bare particularism has yet been offered to explain how the unity of a substance can be generated due to the bareness of the bare particular, and if haecceity can do a good job without the unusual, if not inconsistent, notion of bareness (as we will seek to establish in the second part of the thesis), haecceity should be strongly preferred.[85]

To sum up, this section sets out other considerations which make bare particularism less attractive compared with haecceities. Haecceity theory can prove its utility without needing to clarify the nature of bareness or explain *how* bare particulars can *have* properties. It is more suitable in accounting for the unity of substance.[86]

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[85] As a result, haecceity, as we understand it, is a property, and it can be instantiated or non-instantiated, while it is very hard to make sense of the instantiability of a particular, no matter whether it is bare or not. Of course, there are instantiation relations in bare particularism, but it does not mean a bare particular itself is instantiable. This is not a defect in itself. But it is widely held that non-instantiable haecceities are useful. For instance, the possibility of non-instantiated haecceities can help presentism to explain the referent of past or future entities. Haecceity can be the surrogate of many non-actualized entities (Adams 1978, Diekemper 2009). The point is, again, that the applicability of haecceities is much wider than bare particulars. Of course, a bare particularist could still have these benefits by accepting the existence of merely possible particulars (possibilia), but whatever the problem is, that would not be a virtue of bare particularism, because everyone can appeal to possibilia. The virtue for haecceity theory is that the haecceity itself can provide all we need. It is much more appealing in terms of parsimony.

[86] One interesting question is whether haecceity theory and bare particularism are compatible. In a footnote, Connolly (2015) says that "Nathan Wildman … envisages a version of bare particularism … which is just the Haecceity Theory" (pp. 6–7). It is not clear what Connolly's understanding of haecceity is, nor is it clear that Wildman would like to call his position a Haecceity Theory. But at least this shows that taking bare particularism as one kind of Haecceity Theory is not groundless (provided bare particularism gives up some core elements of its theory). Both haecceity and bare particulars are theoretical entities, and if they can do exactly the same job, then they may well be equivalent. But before that is shown, it is better to be a bit conservative and not to take them as the same theory.

5.   An interim conclusion

Part 4 (B) of this chapter has argued against bare particularism as a solution to the Problem of Distinction. After introducing different versions of bare particularism, it was argued that: firstly, bare particularism violates the principle of category-distinction because bare particulars are particulars; secondly, it is not clear whether bare particulars are ontologically prior to substances because substrata are usually taken be either identical with the substances or dependent upon the substances; thirdly, even if bare particularism itself is coherent, it is not the best theory compared with haecceity theory. Unless modified through some appeal to haecceity theory, it seems the common version of bare particularism should not be accepted as a solution to the Problem of Distinction. In the next main part, we will turn to another proposed solution, trope theory.

(C) Trope Theory

In Part 4 (A) and Part 4 (B) of this chapter we have argued against both the spacetime-points solution and the bare particular solution to the PoD. In this part we will argue against the third positive proposal which is popular in the literature, namely trope theory. This holds that the distinction of tropes explains the distinction of objects. For instance, in the sphere case, the claim is that the two seemingly qualitatively indiscernible spheres are discernible after all, because each sphere has unique tropes. There are two spheres because there are two distinct sets of tropes.

Section 1 is a brief introduction to trope theory; Sections 2 and 3 argue that the distinction of tropes is neither sufficient nor necessary for the distinction of the spheres; Section 4 is a conclusion.

1.   What are tropes?

Like many other philosophical theories, trope theory has many versions.[87] We will outline some of the most popular doctrines.

Consider three exactly similar red, spherical and sweet tomatoes, *a*, *b* and *c*: to account for their similarity in redness, if we accept universals, the explanation would be that there is one universal redness instantiated by the three tomatoes. But for a trope theorist, the similarity would be explained by saying that there are *three distinct but exactly similar* red tropes: the redness *of a*, the redness *of b*, and the redness *of c*.[88] Thus, a trope is usually taken to be an *abstract particular*. It is abstract because it functions like the universal property, it can be instantiated, and it is used to *characterize* its substance. It is a particular because a trope is usually unique to a single substance (we will clarify the notion of this uniqueness in later discussion), and tropes are as countable as their bearers. So, a trope always has two roles: as a countable particular which can be characterized,[89] and as a property which is used to characterize other entities.

Thus understood, tropes (especially what some call the *modular* tropes; see more below) are by their nature *both* a substance and a property, but they are still said to be "*simple*".[90] (Note that saying one trope has two roles is different from saying that there are two kinds of tropes, which is a recent view proposed by Garcia, see section 2.)

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[87] The term "trope" is from D. C. Williams (1953), although many of his original ideas have been given up by contemporaries.

[88] Trope theories differ in how to name tropes. It might also be called *a's being red* (not to be confused with a state of affairs).

[89] This is just a rough picture which is applicable for most traditional trope theories. It might be said the "modifier tropes" are not a particular at all. But the notion of a modifier trope always *comes along with* a modular trope. See below.

[90] The dual-aspect of trope theory has frequently been criticized and discussed: how could tropes be "simple" if they have many roles? Due to the word limit we not go into the details here. See Hochberg (2004), Ehring (2011) and Gibb (2012).

The similarity relation between two tropes is (primitive) *resemblance*. In the case of universals, similarity between two instances of universals is explained by partial identity: the identity of their universals. In the case of tropes, identity is replaced by another *equivalence relation*, "exact resemblance". And it is claimed that this equivalence relation can do (almost) everything we need numerical identity to do. Most trope theorists argue that the resemblance relation should be internal: it is an *ontological free lunch*. We will see how this would influence our evaluation of the proposal.

Trope theories are mainly motivated by two considerations:[91] one is that tropes can be viewed as a middle position between traditional nominalism and universals theory in solving the One-over-Many Problem; the other is linked to the one-category ontology (bundle theory) which many trope theorists hold. The first reason is to be evaluated in the remainder of this chapter, and we will talk about bundle theory in next chapter. In this chapter, we assume a trope is always a trope of some non-bundle-like substance.

According to trope theory, in the spheres case the fact that there are two substances should be explained by the fact that the two spheres have different tropes. The (seeming) indiscernibility of the two spheres is not because of shared universals, rather it is because the distinct tropes of them exactly *resemble* each other.

Having outlined some basic ideas of trope theory, we are now going to evaluate whether tropes can be used to explain the distinction based on our principles.

2.   The trope-distinction is not necessary for the substance-distinction

The plan of this section is as follows: we will argue that trope-distinction is *not* necessary for distinct substances, which means two substances can share all their tropes and still being distinct. In other words, we can argue that tropes are at least *transferable,* hence sharable, between two substances (see below). For us, the most plausible reason to say tropes are *non*-transferable is that they are individuated and *dependent* upon substances. But saying that tropes are dependent upon substances will violate another Principle of Ontological Priority. After considering a unsuccessful remedy, namely the modular proposal, we will conclude that tropes can still be transferred between two substances and hence it seems two substances can have the same tropes. Trope-distinction turns out to be non-necessary. Let me explain in detail.

A good solution to the PoD has at least to be necessary. For most pairs of distinct substances, intuitively they can be said to have distinct tropes. But the problem is that this is not necessarily so: as we will now argue, it seems possible to have two things sharing the same set of tropes, *not only* sharing universals but also tropes, in the strict sense of "sharing". For instance, it seems coherent to accept *both* bare particulars and tropes. Putting aside for a moment our criticisms of bare particularism formulated in the previous chapter, we can say that substances may be distinct because

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[91] Other motivations may include that tropes can be good truthmakers, and explain the object of perception.

of distinct bare particulars. Then in that case, nothing can prevent the *distinct bare particulars* from having the *same* set of tropes. In other words, if one substance has certain tropes and a bare particular as constituents, then it is possible to have a distinct substance which is constituted by exactly the same set of tropes and a distinct bare particular. More generally, if tropes are *constituents* of substances, then it is possible that the two substances partly overlap in their tropes, like two roads intersecting at a point, in which case having a point-sized intersection seems to be a shared trope of the two roads. If, for instance, it is theoretically possible to have two *co-located* spheres, then the two spheres can be said to share the same set of tropes (especially when tropes are individuated by spacetime points).

Transferability

One quick reply from the trope theorists will be like this: tropes are intimately bound up with the particular they belong to. In other words, one trope cannot be "transferred" from one particular to another. For instance, Heil says "if the ball's sphericity, mass, and momentum are ways the ball is, there is no question of the ball's sphericity, mass, or momentum migrating to another object" (2003, pp. 141–42).

In that case, it is not possible to have two things sharing the same set of tropes. But there are different understandings of "non-transferability". For instance, Cameron (2006) distinguishes three levels of non-transferability: the weakest level only says "[tropes] can never *in fact* belong to anything else"; the stronger level says "nothing which is not A *can* have the trope of A's being F"; and the strongest level says "not only can no other object have that trope, but that the trope *must* belong to the object". The second claim is stronger than the first because it precludes the possibility that in another world *where A does not exist*, the trope of A is had by a different particular; and the strongest claim also precludes the possibility of *non-instantiated* tropes. As Cameron points out,

> All that Heil's comments suggest is that given that this mass, this sphericity etc. belong to this ball, they can never in fact belong to anything else; they do not seem at all to motivate the claim that there is no possible situation in which that very mass, that very sphericity etc. never in fact belonged to that ball but to something else. (2006, p. 100)

The situation Cameron mentions (a possible situation where the same trope belongs to another particular) does not directly entail the possibility of two things sharing their tropes. In fact, he might agree with Heil that "within a world" it is not possible to have two things having the same tropes.[92]

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[92] This does not mean we can only compare things intra-worldly, and once the notion of possible worlds is introduced here, our picture of two things having the same tropes is more vividly intelligible: we can say there are two particulars in different worlds sharing the same trope. In w_1, trope t is had by particular a, and if we interpret the idea that the very same trope t "could have been" had by another particular b as saying that there exists a world w_2 where t is had by particular b, then it makes perfect sense to take a and b as two things sharing a trope t. (Under some monist views, a world itself, as a spacetime continuum, could be counted as the only property-bearer, and then the possibility of two indiscernible worlds is just as real as the possibility of two spheres sharing their tropes.) But maybe that shows just that trope theorists who like possible-worlds talk should adopt counterpart theory. In general, Heil's intuition may not be strong enough to forbid some sort of trope

The weakest view is enough to forbid trope-sharing if we only focus on the intra-world situation of the spheres.

However, forbidding trope sharing by adopting Heil's intuition will get the ontological priority required for our problem wrong. As one of the principles of evaluation says, to use a distinction fact A to explain fact B, entities in B cannot be more fundamental than A. But if tropes are understood as something like *ways* or modes substances are, then clearly this means tropes are dependent upon substances, and substances are more fundamental: a way is always a way *of* something. (If the weakest view of transferability faces this problem, so do other stronger views.) And the worry would be the same no matter whether the dependence is rigid or non-rigid.[93] Provided tropes must be instantiated by *some* individual substance, they cannot be used to ground the distinction of their bearers.

Relatedly, it does not help to object that if two substances can have the same tropes, that makes the individuation of tropes *unexplained*. In the literature, there are three popular choices concerning how to individuate tropes. They are primitively individuated; they are individuated by their bearing substances; they are individuated by spacetime locations (Schaffer 2001, Campbell 1990). We have rejected the third choice in Part 4 (A) of this chapter, and to avoid violating the ontological priority principle, the second choice should also be given up. Then the trope solution has only one choice: tropes are primitively individuated.

Modifier vs modular tropes

Now we will consider a possible reply which takes tropes to be *independent*. Namely, there are two kinds of tropes, the *modifier* trope and the *modular* trope, and only the former may be said to be dependent upon substances, while the modular trope can be primitively individuated. Let me explain.

Garcia (2010) is an author who distinguishes the modular tropes from the modifier tropes (though he does not fully commit to these notions in his own ontology). A modular trope of redness is itself red and does not have other substantive features. It is *like* ordinary particulars except that it only has one character. Hence a modular trope contains particularity within itself, and can be primitively individuated; by contrast, a modifier trope of redness is itself not red, but it *gives* its substance redness.

Each position faces serious problems of its own. The modifier trope theory must explain why it is better than universals, if both can characterize substances. In the context of the Problem of Distinction, in order to get the right ontological priority a trope cannot be merely characterizing,

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transferability unless some special assumption of modality is allowed. But the situation within the same world is complicated enough for the spheres. We will continue to focus on the intra-world problem of distinction.

[93] x depends rigidly on $y =_{df}$ necessarily, x exists if y exists; x depends non-rigidly on the ys $=_{df}$ for some F, the ys are the Fs, and necessarily, x exists only if there is something, z, and z is an F (Lowe 2006, Chapter 3). In our context, a trope's non-rigid dependence on some substance means that if a trope exists, then it must be exemplified by at least one substance.

otherwise it will be dependent on substances. So, *for the trope solution to work*, the trope used here *cannot* be the modifier trope.

So it seems that a modular trope should be preferred because it may be said to be independent from the substances. So, the possible reply says, if modular tropes are accepted, the worry about priority is gone. However, there are some unwelcome difficulties still to be faced.

Firstly, it is hard to understand how an independent, red particular can have only the property of being red and nothing else. For instance, it is very plausible that every coloured individual is also shaped. And it is hard to imagine a particular red individual alone without imagining it as an individual which is also shaped. This is what Garcia (2010) calls the "thickening principle": for instance, every juicy *particular* has mass; every coloured *particular* is shaped.

It might be said that a red modular trope does not have to be shaped; rather, all we need to say is that the red modular trope and the shape modular trope are *necessarily co-instantiated*. But this story still misses the point: a modular trope, as Garcia explains, should be like ordinary objects except that it only has one feature and nothing else. But why believe in such a special entity, given that all other *particular objects* have more than one feature? Again, modular tropes and other particulars are all particulars and they should be on a par as far as the *thickening principle* is concerned. Otherwise this sounds ad hoc.

Secondly, and more importantly, if in replying to the first problem the modular theorists allow that the modular trope has many qualities, then it would just make the modular trope *indistinguishable* from ordinary individuals. If a trope is not only red, but also juicy and spherical, then why not just say it *is* an apple? The modular trope account, even if it is better than the modifier one, cannot give us a satisfactory answer. This simply makes modular tropes collapse into substances (or similar states of affairs).

As a result, saying that two substances are distinct because two modular tropes are distinct will be uninformative. Unless we are primitivists who refuse to give an explanation, the question is still here: what makes these two modular tropes distinct? It seems a theory of haecceity is still needed. In the later chapter on haecceitification, we will argue that tropes are a combination of universals and haecceities. In that picture, the modular tropes can be analysed into a particularity and its content (the universal).

Now the situation should be clear: two spheres can even have the same set of tropes.[94] This is because it seems highly likely that the best way to dismiss this possibility is to argue that tropes are non-transferable, but the non-transferability intuition (both weak and strong) just expresses the idea of

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[94] There is a more straightforward but controversial way to argue for this. We put it here in this footnote for interested readers. The universals shared by the two spheres could just be viewed as the *tropes of the sum* of the two spheres: If the sum of the two spheres exists, then its properties should be just the universals of the two spheres. But because there is only one sum in the spheres' universe, then its properties are just the properties of the sum, namely its tropes. Then, clearly, two spheres in a sense share not only their universals, but also the sum's tropes, because their universals and the tropes of the sum are identical.

individuating a trope by its bearer. That would make trope theory unsuitable to solve the Problem of Distinction, because tropes are now dependent upon substances. Thus, having a distinct set of tropes is not necessary for there to be distinct spheres.

We have argued that using tropes to explain the distinction of substances is not necessary. The next section will argue that it is not sufficient either.

3. Trope-distinction is not sufficient for substance-distinction

Now let us examine whether the trope proposal is sufficient for the distinction of substances. Unfortunately, as will be argued in this section, the *mere existence of two tropes* is not sufficient to determine the distinction of substances.

The reason is very simple: it is because one single substance can have different tropes as well. For instance, again, it is not hard to imagine a case where there could be one bare particular with many distinct tropes. This situation cannot be distinguished from a situation where two bare particulars have the same tropes as far as the tropes are concerned.

Things would be clearer if we compared this with the spacetime proposal or the bare particularism proposal we discussed in sections (A) and (B). In spite of their other failings, sufficiency was not a problem for those proposals because ideally a substance is non-extended and has at most *one* spacetime point (if it is in spacetime at all), and one substance has at most *one* bare particular. If we find there are two bare particulars, we can be sure that there must be *more than one* substance. But we cannot do this for tropes: if we find there are two tropes, it cannot be guaranteed that they are two substances or one. One thing can have more than one trope. Unless we argue that one substance can have at most one trope, which sounds very implausible, then the mere existence of distinct tropes is not sufficient for the distinction of substances.

Naturally, a quick reply is: one substance can have two tropes of different kinds (which is trivial and insignificant), but not two tropes of the same *kind*. A person cannot be both short and tall. In the following, we will argue that, on the one hand, two tropes of the same 'kind' in the normal sense can be instantiated by one substance if 'extended simples' are possible; and on the other hand, such an intuition about trope-kind is misleading in various ways.

3.1 Extended simples

The first argument we give is this:

(1) If extended simples are possible, then two tropes of the same kind can be had by one substance

(2) Extended simples are possible

Conclusion: Two tropes of the same kind can be had by one substance

The validity is clear. Let us begin with premise (2). An extended simple is an object extended in space that nonetheless lacks proper parts. As it will be shown, the notion itself is coherent (e.g. Braddon-Mitchell and Miller 2006, Pickup 2016). The main difficulty in making sense of this notion is how to accommodate it with the Moorean fact that, for instance, any ordinary object always has two halves, and in language we can always assert correct sentences using terms like "parts" or "halves". For instance, if an extended object o has a property (no matter whether it is a trope or a universal) F, *being a half*, at region R_1 (which is a *proper part of the region* o *occupies*), and another property G at another non-overlapping region R_2 (also a proper part of the region o occupies), then a traditional interpretation will understand this as saying that F and G are respectively instantiated by two proper parts of the object o, the part at region R_1 (written as "o-at-R_1") and the part at region R_2 (written as "o-at-R_2").

But, as we indicated in Chapter 2, ascribing the parts to the object itself is not the only way to explain the fact that o is F at R_1 and o is G at R_2: we can either take an adverbial theory (for instance, Johnston 1978) or a theory of indexicalised properties which is parallel with the common tactic used by most endurantists (see below).

In the former case, the logical structure of "o is F at R_1" turns out to be R_1 (o is F), which means being at region R_1 is just a modifier of the sentence "o is F': it does not characterize the object o directly and hence o need not have regional parts. In Schaffer's (2010) term, instantiation is "regionalized". As a result, the putative parthood of the object is explained away in terms of the way it instantiates properties. The object itself does not have parts directly. (Note that this adverbial theory itself is not incompatible with trope theory, but our purpose here is to make sense of "extended simples".)

In the latter case, the logical structure of "o is F at R_1" and "o is G at R_2" should be like "o is F-at-R_1" and "o is G-at-R_2". What the object really has is *two properties* whose nature contains the information about spatial regions, *being F at R_1*, and *being G at R_2*.[95] (This is not completely unusual because its counterpart with a temporal modifier, like *being-F-now*, or *being-G-at-time*-t, has been

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[95] It is also possible to go further and think, like Parsons (2000) did, that there is only one distributed property "being F here and being G there". One worry for this is that if there is only one distributional property, then our case may not be a case where one substance has two tropes. But then we can take a single distributional property to be a structure universal which has the two "smaller" properties as distinct *constituents*. Note here all we need to say is that this constitutive notion of distributional property is *coherent* and *possible*. There may exist a simple and structureless distributional property, but provided it is possible to have a constitutive alternative, the case is still a case of one substance with two tropes. This will become more explicit with examples: in the beginning, the trope theory says there are two spheres because there are two red tropes. Then, our story is simply that seeing two red tropes does not mean there are two spheres, rather, there can be only one extended one (see more below). Now, if a trope theorist "redescribes" the case as a case where there is one thing with one distributional property, then she is just changing the topic: because our point is, assuming there are two tropes, the trope distinction cannot explain the substance distinction because one substance can have two tropes as well. Moreover, even if the constitutive notion of a distributional property is not possible (which seems not easy to establish), a trope theory still needs to *solve* the problem of distinction for cases where two things share the same distributional property (trope): after all, if there is only one distributional trope, it seems nothing can prevent two substances from having it. Then we will be back to the point in Section 2.

widely used in the debate on persistence.) As a result, the putative parthood of the object is explained away in terms of how properties themselves are related with space. Again, the object itself does not have parts in the traditional sense.

Another less standard strategy is to make R_1 and R_2 *substantialized*. Not only can the object be the shape bearer, but also the region of space itself. That is to say, we might draw a distinction between the shape of the material object and the shape of the region it occupies. The relation between the object and the space is a two-place relation, *occupation*. The shape of the object is analysable in terms of "shapes had by the region itself and the occupation relation" (McDaniel 2007, p. 140). The object is extended in virtue of bearing different occupation relations with different regions, but that does not mean the object has proper parts which are correspondent to (or located in) the proper parts of the region. The parthood of the object is in fact the parthood of its region of space. Metaphorically speaking, "occupation" in the extended simple case could be a one-to-many relation between a thin occupier and its region of space. Via this special one-to-many occupation relation, the object itself can be simple.

Although for our current purposes, it is not clear which of these strategies are best, they all show us that the notion of an extended simple does not seem to be incoherent.

It is not hard to see why premise (1) is true when the discussion on premise (2) above is appreciated. We just need to show how the possibility of extended simples can give us a case of one substance having two tropes of the same kind. As we noted in Chapter 2, one such example can be seen in Hawley.

> [W]e can take Black's universe to contain exactly one object, with just those properties,—mass 2 kg, volume 2m^3—we would expect from the sum of the two spheres. […] According to the summing defense […] the universe contains only a scattered two-sphere-shaped object. In the quantum cases, an advocate of the summing defense would deny the existence of the individual particles, and accept only the existence of the larger system. […] The summing defense commits us to the existence of scattered simples. (2009, pp. 101–19)

Here Hawley considers a case where the two spheres can be viewed like a "scattered simple", which is, of course, extended. The "larger system" does not have mereological parts, and it denies the existence of two individuals. But all the qualitative arrangements would be unchanged. Nothing can prevent that extended simple from having two sets of exactly similar tropes. After all, the only difference between the simple situation and the composite situation is whether there is a parthood relation. It is hard to see how this difference can have an influence on the property distributions. That is to say, the two sets of tropes cannot determine whether the two spheres are distinct or not. (This

does not mean Hawley's suggestion can solve the central Problem of Distinction; it only shows why tropes are not sufficient for the distinction of substances.)[96]

It should be acknowledged that our point is modest: we are not saying extended simples are problem-free, only that if the notion of an extended simple is coherent, the mere existence of two tropes, like a red trope and a yellow trope, may not be sufficient for the distinction of substances.

Now let us move on to another angle of the problem of sufficiency by considering a possible objection, namely that our case of extended simples violates a principle about determinates.

3.2 "Determinates"

We argued that an extended simple can have two tropes of the same kind. But is not the notion of a property-kind problematic in the first place? What does it mean to say that some tropes are of the same kind, while others are not? The standard way to cash out the intuition of property-kind is in terms of *determinables*.[97] The determinable and determinate relation is a sub-class of the wider relation between instances and kinds.[98] Being scarlet is a determinate of the determinable "being red". Being scarlet is a special way of being red. Relatively, being red or being green is a determinate of the determinable "colour". Also, being red is a special way of being coloured. It seems to be a quite plausible metaphysical principle that "no one substance can have two determinates of the same determinable". More rigorously,

> If *x* has determinate P of determinable Q at time *t*, then *x* cannot have, at *t*, any other determinate R of Q at the same level of specificity as P.[99] (Wilson 2017)

According to this principle of determination, intuitively one substance cannot be both red and yellow because being red and being yellow are two determinates of the same determinable.

Thus, the possible objection goes, if there are extended simples having two tropes—say, being red and being yellow—then the principle of determination will be violated. But that principle is overwhelmingly plausible, so we have good reasons to reject extended simples. In fact, this objection

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[96] Further, it is also possible to extend the point to non-special cases. Tropes are not only insufficient for the distinction of Blackian spheres, but also insufficient for any two substances, like a red apple and a yellow banana. That is to say, given a red trope of A and a yellow trope of B, we cannot conclude that A and B are distinct substances, because one substance can also have two tropes like the trope red and trope yellow. This one substance could be an "extended simple" of the apple and the banana. But as Hawley (2009) points out, this is a road to *monism*. We will remain neutral here.

[97] The following characterization of determinable is widely assumed in contemporary discussion, though historically and originally, Johnson (1921)'s view on this issue was quite different. He seems to hold only the highest dimensions exist.

[98] For instance, the relation between an individual and a universal could be viewed as an instance-kind relation but not a determinate/determinable relation.

[99] One notable exception (Johansson 2004) is the determination between colour, smell and *property*. The former two would be two determinates of *property*, but they are not incompatible. Note that the worry can also be seen if we replace "property" by "intrinsic property" "physical" "non-abstract" "non-relational property" "objective" "material" and so on. So, in order to avoid trivial falsity, the principle has to be limited to certain cases. To be fair with our opponents who favour this principle, we will only focus on cases like red and colour.

itself can be viewed as another version of the trope solution to the PoD: that is to say, according to the story, there are two substances *because* there are two *determinates* of the same determinable.

Of course, those who are deeply pessimistic about the existence of determinables in the first place (e.g. Gillett and Rives 2005) may not be moved by the above objection. However, even if we grant the existence of determinables, this objection is still seriously misleading.

Circularity

Firstly, there is the circularity worry. Sensitive readers will be reminded of what we argued in Chapter 2 on the circularity of the notion "incompatible". Here the situation is not that much different from the notion of compatibility. Arguably, the determinate and determinable relation should be defined in terms of property compatibility, or at least this is where the plausibility of the above principles comes from. If two properties cannot be had by one thing, then they are *called* two determinates. But whether they can be had by one thing is just the Problem of Distinction we are exploring!

The idea of incompatibility is how Searle (1959) defines the determination relation:

> For any two terms A and B, A is a determinate of B if and only if A is a non-conjunctive specifier of B, and A is logically related to all other non-conjunctive specifiers of B [where] any two terms are logically [i.e. conceptually] related if either entails the other or either entails the negation of the other. (Searle 1959, p. 148, cited from Wilson 2017)

Under this definition, the reason that being yellow and being red can be two determinates of colour is precisely because, for instance, being yellow entails *not* being red (its negation). But this is just another way of saying they are *incompatible*. In fact, the notion of a determinate is intimately associated with identity conditions.[100] For instance, Lombard (1986, pp. 32-41) argues that an identity criterion of some objects should be taken to be a determinable which determines a class of properties to the objects involved. Also, Macdonald (2005, p. 60) holds that "an object's identity conditions specify determinate forms of the determinable properties". In general, we are tempted to say that to claim properties F, G are two determinates partly *means* that for any x and y, if Fx and Gy, then x and y must be distinct. In other words, the principle that nothing can have two determinates of the same determinable offers *the implicit definition* of the very notions of determinate and determinable.

Therefore, using determinates to ground the substance distinction seems to be circular. How to use the definition with real properties and how to identify property incompatibility is exactly the starting point of the Problem of Distinction (and of individuation in general)[101].

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[100] In some philosophical debates, notions like "identity conditions", "identity criteria", and "principles of individuation" are used differently, but their differences do not matter at the moment for the purpose of our argument.

[101] Although as said in the Introduction, we will not consider the Problem of Distinction/Individuation for properties, still, haecceities can be useful in understanding incompatible properties: for example, two properties are incompatible if they cannot be haecceitified by the same haecceity.

This is the circularity worry. Note it may not apply to everyone because it may be possible to define the determinate/determinable contrast in a different way. But even if the idea itself is clear, its applicability is still problematic. This leads us to the next point.

Rellow and Grue

Secondly, how to make use of the notion of determinates in concrete examples is still unclear. This is because saying it is a principle that one substance cannot have two determinates of one determinable is one thing, while *applying* this principle *to* concrete cases is quite another. Again, to successfully solve the PoD on their terms, the trope theorists must prove that, for instance, in the case of an apple and a banana, the two distinct tropes are indeed two *determinates* of the same determinable; but it is not clear that a red trope is a determinate for the one substance (S) in a context where extended simples are possible, because a determinate should be a unique and ultimate dimension for the individual which has it. In the aspect of colour, the determinate colour of S, the extended simple of an apple and a banana, is *neither* red, *nor* yellow, and we may define it as *rellow*. For instance, in an adverbial theory, something is rellow if and only if it instantiates-here red and instantiates-there yellow. We may then define a new determinable[102] *bicolor* for all the substances with two mixed colors. Then rellow is a determinate of bicolor, and grue (green and blue) is another determinate of bicolor. Then, according to the principle of determination, it is not possible to say S is both grue and rellow relative to bicolor. But the trope red and trope yellow are *not* determinates of the bicolor. Of course, *ex hypothesi*, the two tropes yellow and red are still there. But there is nothing incoherent in allowing "rellow" to have two "smaller" constituents. It contains the red trope and the yellow trope as distinct constituents.[103]

Relativity of naturalness

As we said in Chapter 2, one common reply to our point is that properties like grue or rellow are not natural and cannot do the proper "joint carving". But it is completely unclear for us why being green should be more *natural* than being grue. Note that we do not need to reject the idea of *naturalness* altogether; drawing a line between natural properties and non-natural ones could be attractive and

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[102] It is hard to see why such a new determinable cannot be defined. Funkhouser (2006) argues that colour is a determinable while *colour-and-shape* is not; see also Prior (1949). But for us it seems being coloured in the red way and being coloured in a shaped way are *both a specification of "being coloured"*. And it is not clear that why we cannot construct a new determinable from the colour and shape. Colour occupies a certain colour space; shape also occupies a certain space; mathematically, we can construct a new space which maps the points in the space of colour and the space of shape. Similar debates have been seen in the case of natural kinds. We cannot easily say that one property is more natural than another just because one is more used in scientific practice. The relation between the determinate/determinable relation and the instance/kind relation is not clear, but if we, following many others, take the former to be a subclass of the latter, then the question of arbitrariness in natural kinds should not be ignored in the discussion of determinables. Finally, even if *colour-and-shape* may not be defined as a determinable, *bicolour* is still quite different.

[103] Similarly, if it is possible to define a *determinable* being colour-and-shape, then the metaphysical principle of determinates only says that it is not possible for some substance to be both red-round and green-square. This alone does not show that the determinable red-round is any different from the determinable red-yellow.

useful. But the worry is *which properties* in the empirical world are qualified to be regarded as more natural. The notion of naturalness *per se* is fine, but again its *applicability* is not straightforward. Appealing to common sense does not help either. As anthropological studies have forcefully demonstrated, common sense could be much more diverse than it seems.

Also, it is not decisively convincing to say that "grue" (or "rellow") is not a *bona fide* predicate because it is not *simple* enough, and can be constructed from more basic ones like being green and being blue (cf. Ayer 1952). But for those who take grue properties as basic, the order of construction could be reversed: for instance, for those who take rellow (being red here and being yellow there) and gellow (being green here and being yellow there) as two basic predicates, the predicate "being yellow" will be more complex. It can only be grasped as the overlapping part of being rellow and being gellow. The process that those people use being rellow and being gellow to understand "being yellow", is highly similar to the process that we use phenomenal and familiar vocabularies to indirectly describe scientific notions like "electrons" and "quarks".[104]

Before these issues are carefully settled, it would be premature to say that extended simples will violate the metaphysical principle of determinates. The point is that the possibility of an extended simple is perfectly compatible with the logical requirement that we cannot find two determinates within one substance. If this sounds a bit counterintuitive, the issue lies in how to *recognize* the instances of determinates without circularly assuming the distinction of substances. Once we appreciate that the recognition of determinates is relative to the substance, the objection that we are violating the determination principle does not work.

In this lengthy section, we have argued that extended simples are possible, and tropes are *not sufficient* to establish the distinction of the distinct substances because the mere existence of the two tropes (whether of the same "kind" or not) is compatible with there being only one substance. We also argued that we must use the determination principle carefully.

4.   Conclusion

After a summary of trope theory, Part 4 (C) of this chapter argued that the trope proposal is neither necessary nor sufficient for explaining the distinction of substances. Our main aim was to evaluate the trope proposal in solving the Problem of Distinction, rather than attacking trope theory in general. We only evaluated the theory with one of the principles we set out. If what we have argued is plausible, then it is enough to conclude for now that trope theory cannot solve the Problem of Distinction.

Taking the three parts 4 (A), 4 (B) and 4 (C) together, this chapter as a whole has argued that none of the three representative solutions to the PoD in the literature is successful. By contrast, the next chapter will evaluate one of the most representative negative "solutions", the universal bundle theory.

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[104] I heard this point from Richard Woodward.

Chapter 5
Bundle Theory and the Problem of Distinction

We have argued that the three main positive strategies to solve the PoD all fail. Now let us turn to the negative strategies that deny the very distinction of the two spheres. We will argue that one of the most representative negative strategies ("solution") in the literature, the Universal Bundle Theory, fails (although as we will see, some versions of it can be a positive solution). According to the most popular version of this theory (O'Leary-Hawthorne 1995, Curtis 2014), the Blackian spheres case cannot be used to support the existence of discerning elements like bare particulars or haecceities, because there are *not* two spheres in the Blackian world at all: rather, all we have there is one sphere which is bi-located, namely, *one single and bi-located bundle of universals*.[105]

Section 1 outlines various versions of the bundle theory, especially two versions of universal bundle theory (UBT), the identity-view and the instance-view, and it explains why only the former should be seriously considered. Section 2 discusses a methodological worry which pertains to "negative strategies": namely, whether they are *irrelevant* and simply change the topic; Section 3 shows that the version still in play, namely the identity-view, is still *indeterminate* because it can be further divided into two further theories, the identity identity-view (IIUBT) and the instance identity-view (InIUBT). Only the identity identity-view (IIUBT) could be used to deny the existence of the two spheres. But it also faces unwelcome consequences. Section 4 discusses Robert Garcia's Non-Property Challenge to bundle theories in general. Section 5 further argues that, no matter which specific version of UBT we choose, they are all problematic because of their commitment to the *immanence* of universals. Section 6 summarizes the main conclusions.

1.   Various bundle theories

Bundle theory holds that substance is fundamentally constituted by properties. For instance, a tomato is nothing but a collection of its sphericity, redness and juiciness. Such a view is usually motivated as a parsimonious one-category ontology. If certain bundles of properties are co-instantiated, then automatically we get the substance being constituted from those properties ('for free').

Properties could be tropes or universals. For instance, Russell (1940, 1959), O'Leary-Hawthorne (1995) hold a bundle theory of (multiply instantiable) universals. By contrast, many others including Williams (1953) and Campbell (1990) argue for a bundle theory of tropes. The problems for trope theories in general, as we argued in Chapter 4, are also problems for these bundle theories with tropes. So, our focus will be mainly on the bundle theory with *universals*.

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[105] Another interpretation with *a similar effect* is Hacking's (1979) idea that the bundle is in only one location but that spacetime is circularly shaped. But that is a *derivative* version of the spacetime points solution we have discussed in Chapter 4. For instance, it also needs to explain the dependence relationship between the curved space and the objects.

Traditionally, bundle theory faces (at least) two problems: one is to account for the possibility of 'change' (namely, it seems it has to commit to some version of mereological essentialism), and the other is the objection from the possibility of distinct indiscernibles. Many attempts have been made to solve the first problem[106] and it is not the main concern of this chapter. By contrast, how different bundle theories with universals reply to the second problem is worth considering, because the typical case for the possibility of distinct indiscernibles is none other than Black's spheres, and it poses a problem for all versions of bundle theories. In the literature, there are two representative views.

Identity view

On a first look we might say that if a substance is identified with a bundle of universals, then the identity of the bundle of universals should logically entail the identity of the substances. But a closer look at the nature of universals leads some UBT theorists (O'Leary-Hawthorne 1995) to argue that if we accept *immanent* universals (that is, universals which are wholly present in each instance, in contrast with being *transcendental*), then it is the very nature of a universal that *it* can exist wholly and completely at some distance *from itself*.

Then it is argued that Black's spheres should be understood as one bundle of universals which are instantiated twice. This is what Curtis (2014, p. 299) labels the "identity view" of UBT. According to this view, the apparent two spheres are *one bundle* of bi-located universals. It is one sphere which is a few meters away from itself.

Instance view

However, there is another version of UBT in the literature developed by Rodriguez-Pereyra (2004), which is in clear contrast with the identity view. Curtis calls it the "instance view" (2014, p. 299). This holds that a substance is identical with an instance of a bundle of universals. The idea is that if universals can be multiply instantiated, the same goes for a "bundle". A bundle has many *bundle instances*, so the two spheres, says Rodriguez-Pereyra, is *two bundle-instances* of the same bundle.[107]

Problems for the instance-view

Those two views' understandings of the spheres are quite different.[108] The instance-view is essentially a positive solution because it respects the basic datum we are trying to explain, namely that there are two distinct spherical substances.

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[106] For instance, Simons's (1994) nuclear bundle theory tries to explain the possibility of changing members of the property-bundle without losing its substance identity.

[107] One further motivation for Rodriguez-Pereyra to develop such a view is that he tries to reject the principle of constitutive identity (Necessarily for any x and y if they have exactly the same constituents, then they are identical) that is used in the Indiscernibility Argument against bundle theory (Loux 1998, p. 107. See also Van Cleve 1985, Cassulo 1988, and Hughes 1999). Here we reconstruct the dialect and use bundle theories to deal with the Problem of Distinction instead of various formulations of the Principle of Identity of Indiscernibles.

[108] Another less-often mentioned version of UBT is the "overlapping view" developed by Shiver (2014). It holds that there are not only two but three spheres in Black's world. One is the unlocated sphere, which is a qualitative

But its shortcomings are not hard to see. It is silent on the mechanism of bundle-instantiation. Instantiation for properties is hard enough, but instantiation of bundles may make it worse. It is not clear *what* determines the numbers of instantiation of the bundles. Rodriguez-Pereyra (2004) does mention that his idea is inspired by the idea of states of affairs, because it seems we can have two (Armstrongian) states of affairs from the same constituents. But there must be an analogous story to be told about *how* two Bundle-Instances can be formed from the same bundle, and what relationship there is between the Bundle-Instance and the Bundle. Unfortunately, it is not clear that such an explanation of "bundle instantiation" is provided by Rodriguez-Pereyra at all. This might not be a decisive objection, but suffice to say that it would be more parsimonious if the UBT theorist could explain the distinction of the spheres without appealing to the notion of bundle instantiation.

More seriously, most motivated bundle theorists try to give the notion of 'bundle' a *minimal* ontological role[109] which makes it unable to explain the difference between a bundle and a bundle instance: if both a bundle and its instances are constituted by the same universals, then why can a bundle be multiply instantiated many times while a Bundle-Instance cannot? As Curtis (2014) asks,

> Consider a multiply located bundle of universals Bun and one of its instances Ins. Bun has the property of existing at more than one place, but Ins does not. But Bun and Ins are by hypothesis constituted by exactly the same universals. So how can they differ in their properties in this way? What is it that grounds this difference between Bun and Ins? (p. 302)

There must be something else other than the universals themselves to explain the distinction between bundles and bundle-instances, otherwise the distinction is mysterious: this is the Grounding Objection.

The above reflections make the identity-view seem a bit more plausible, because it is more conservative than the instance-view in the sense that no extra Bundle-Instances are needed. From now on, we will assume the *identity-view* of UBT is our main target. Again, the identity-view is called "identity" because a sphere is directly identical with the bundle, rather than the bundle instance.

The two spheres are just one bundle of bi-located universals, and there is no distinction of spheres to explain at all. However, before we start on further evaluation, an important worry must be addressed.

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overlapping part of the other two located spheres. The two spheres are distinct because of the distinction of their location properties. But this is a variation of the spacetime proposal that we argued against in the previous chapter, and hence we will not spend any more time discussing it.

[109] Hence it is not desirable to *reify* the bundling relation as anything external to its properties. The bundling relation should not be a further entity. Otherwise, it will be less clear that whether bare particularism and bundle theory are competing theories (Simons 1994, Denkel 1997, Morganti 2009).

2.   The irrelevancy worry

Normally, on an initial encounter with it, most of us feel there is something important about the Blackian case which needs to be explained, and we share this puzzle with everyone including the UBT theorists: How could there be two distinct qualitatively indiscernible spheres? What explains their distinction?

How would a serious identity view theorist who identifies the spheres reply? *Surprisingly*, some identity views based on UBT may reply: "No, there is nothing to be explained! I do not see the two distinct spheres". Therefore, at first glance, if the identity-view (on its current version, although we will modify it a bit in the next section) is right, then the PoD about the spheres has been dismissed.[110] This is why we call it a *negative* strategy. And it seems that if we believe in haecceity theory and hope to use it to ground the distinction of substances, we had better argue *against* the identity view because we have competing interpretations of the data. The main aim of this chapter is to evaluate such a dismissal and assess its coherence.

However, there is a common worry for all negative strategies, especially given that we sometimes also call these strategies "solutions" to the PoD: "a negative solution" cannot be a *real solution* at all: it simply gives the *wrong* description of the situation *we are interested in*, and *changes the topic* to a different and *irrelevant* situation. In other words, a holder of a "negative solution" is "modally challenged". There are possibilities (that there are two spheres) which we can see and which she cannot see (because in her view there is only one sphere).

For example, Rosenkrantz argues against Hacking's proposal by treating the situation as one curved space by saying the possibility that there are two spheres and that there is only one sphere are clearly distinct possibilities, because "no possible universe is such that both descriptions apply" (1994, p. 80. A similar point can be seen in Demirli 2010). Also, this worry is one of Rodriguez-Pereyra's (2004) main arguments against the *identity-view*. As he writes,

> Hawthorne's defence is not effective. The possibility that allegedly refutes the bundle theory is the possibility that there is a world with two indiscernible particulars. Hawthorne shows neither that this is not a genuine possibility nor that the bundle theory can accommodate this possibility. (2004, p. 73)

Similarly, consider Zimmerman (1997)'s remark:

> It is a redescription, is it not? Black's world contains two spheres. But your bi-located bundle is just one thing that shows up in two places. (1997, p. 306)

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[110] Note it does not help to say that the identity-view of UBT's original purpose is to defend the principle of identity of indiscernibles (PII), rather than to solve the PoD. The tension is obvious: on one hand, the identity-view denies the very existence of the two spherical substances, which makes the PoD lose its meaning. On the other hand, even if our concern is to defend PII, the discerning view and the identity view are still in conflict. Many classical metaphysics textbooks use the Blackian case to show why someone would adopt a non-bundle-theoretic position on the structure of objects.

Three metametaphysical models to understand the tension between the two-sphere view and one-sphere view can be identified. According to the first model, the two-sphere description and the one-sphere description are two descriptions of the same reality and both are acceptable. Then the debate is merely verbal, which is not a good choice for any participants in the debate.[111] And explaining the difference in the *meanings* of descriptions without appealing to a difference-maker in reality is not an easy task.

According to the second model, we do have different descriptions of the same reality but *only one* of them is right. Hardcore UBT theorists can always reply that the apparent two-sphere possibility is not a genuine metaphysical possibility. They might argue that their opponents are not in better position to claim their own description is the *right* one. But the debate will then be in a stalemate.

Finally, in the third model, we may take the two descriptions to be about *two different realities*. This is Rodriguez-Pereyra's reply: the two-sphere world and the one-sphere world are just two worlds. This move is coherent but it comes at a big cost: it goes against the orthodoxy of taking metaphysical positions to be necessarily true if true. UBT theory is contingent, i.e. true in some UBT worlds, and the anti-UBT theory is also contingent, i.e. true in other worlds. The reluctance to accept contingency is understandable: can we say, for instance, that I am sitting on a bundle-theoretic chair and you are sitting on a bare particularist chair? It seems not.

Perhaps the irrelevancy worry may make the identity-view dubious enough: if a theory can deliver all we need without leaving us with these meta-metaphysical worries, that theory should be preferred. But still, to avoid any possible stalemate, a safer method which we will use in the rest of the discussion is to assume the viability of the negative solutions as *solutions* in general, and to compare their virtues and costs with other theories. As we will see, even if the UBT is not modally challenged, the current version of the identity-view is still far from satisfactory.

3.   Two versions of the identity-view

We have distinguished the instance view from the identity view, and argued that we should focus on the identity view. This view identifies the spheres with bundles of universals rather than bundle-instances.

3.1   Two identity views

However, there are two further theories of the identity-view which should be distinguished, and this is something that most identity-view theorists fail to do. This is because there are two ways in which a bundle can be metaphysically formed. The bundle could be formed directly from the universals, but it can also be formed from the *instances* of the universals. Usually when UBT theorists talk about

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[111] There has recently been much discussion on the nature of (merely) verbal disputes. For instance, see Williamson (2007) and Hirsch (2010).

bundles, it is assumed that a bundle is a bundle of universals *simpliciter*, but it seems it is also possible to speak of a bundle of universal instances. This corresponds to two sub-versions of the identity-view, one of which is the one we have mentioned. Let us now refer to that theory as the 'Identity Identity-View', and let us call the new version the 'Instance Identity-View'. Both views hold that an object is identical with a bundle (not a bundle-instance), but one view holds that a bundle is identical with its universals while the other holds that although two bundles can share the same universals, those bundles are not identical with those universals. Rather, the bundles are identical with *distinct instances* of the universals. Objects are bundles of instances, not instances of bundles.

According to this view, which we shall refer to as the New View[112], there can be two spheres in the Blackian case, because each is identical with a distinct bundle of universal instances. The two spheres are indiscernible because both are fundamentally constituted by the same universals, and they are distinct because they are constituted by distinct universal-instances and hence identical with distinct bundles (Fig. 1).

Instance-View	Instance Identity-View (the New View)	Identity Identity-View
Object	Object	Object
│ (identity)	│ (identity)	│ (identity)
Instance of Bundle (sphere)	Bundle (sphere)	Bundle (sphere)
│ (instantiation)	│ (identity)	│ (identity)
Bundle	Instances of Universals	Universals
│ (identity)	│ (instantiation)	
Universals	Universals	

Fig. 1. The metaphysical structure of the UBT theories

On one hand, the New View is different from the Instance-View because, firstly, the Instance-View builds the individuality (of the sphere) into the level of instances of the bundle; while on the New View, the individuality of the sphere is parasitic on the individuality of the universal instances. Secondly, the two views differ in the way objects are metaphysically constructed: speaking metaphorically, the Instance-View holds that the universals are "firstly" bundled and "then" multiply-

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[112] After finishing this chapter, we noticed that Rodriguez-Pereyra (2017), in a footnote, indicates something similar to our new view when he discusses *indiscernible universals*. But he says nothing as detailed as what we say here, and we do not need the controversial "indiscernible universals" anyway.

instantiated while the New View holds that the universals are firstly multiply instantiated, and these multiply-instantiated universals are then bundled.[113]

On the other hand, as we saw, the New View is different from the Identity Identity-View because only the former allows, but not entails, that there are two bundles of universal-instances, and hence two spheres in the Blackian case. By contrast, the traditional Identity Identity-View does not allow this. It simply lacks the extra ontological status of universal-instances in the current sense. All there is for the Identity Identity-View is one bundle of universals, and the universal is bi-located, full stop. It is not the case that we have two universals instances *plus* a bi-located universal.

3.2   **Why is the New View** better**?**

Suppose there are fundamentally N universals in the Blackian case. The comparison between the three views of UBT is shown below:

Table 1

In the Blackian case	Instance view	Instance identity view	Identity identity view
How many spheres[114]?	2	2	1
How many bundle instances?	2	0	0
How many bundles?	1	2	1
How many universal instances?	0	2 N	0
How many universals fundamentally?	N	N	N

The New View is best thought of as a kind of identity-view because it identifies objects with bundles, but it is indeed a balanced view between the Instance-View and the traditional Identity-View. Look at the first row of Table 1: the Instance-View and the Instance Identity-View agree that the number of spheres can be two. This is clearly an advantage over the Identity Identity-View: we do not need to deny the intuitive datum that the possibility of two Blackian spheres is genuine, and therefore we can avoid having to deploy the Identity theorist's radical redescription strategy. In short, the New View avoids the charge that it is "modally challenged".

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[113] Intuitively, we may also say that the structures just described represent different relationships of ontological dependence. But the dependence-talk raises the question of whether some bundle theories are *Platonist* or not. We will remain neutral here.

[114] Might it be also necessary to talk about "*sphere-instances*" besides "spheres"? But if spheres are substances, they should not have instances.

The second row of Table 1 reveals another way in which the New View is better than the Instance View. Firstly, there are no entities between the objects and the universal instances and so it keeps the intimacy between objects and bundles of instances, which is an advantage over the Instance-View in terms of simplicity; secondly and more importantly, the New View does not face the "Grounding Objection" that we discussed in Section 1. To recall, the Instance-View developed by Rodriguez-Pereyra does not explain why a bundle and a bundle-instance differ in character even though both are fundamentally constituted by the same universals. By contrast, the New View does not postulate the bundle-instances and hence does not need to account for the ungrounded distinction between bundle-instances and bundles.

So, it is arguable that the New Theory is better than other versions in several respects. Curtis himself does not distinguish the two identity-views but it seems what he has in mind is the Identity Identity-View, and only that view can be a negative solution. But as we have said, all the things equal, a positive solution is better than a negative one, so this gives us a reason for thinking that Curtis's position is not satisfactory.

Curtis might reply that the Instance Identity-View (InIUBT) is more costly because it is more complicated than the Identity Identity-View (IIUBT) he has in mind. But even if that is true, there are other problems which are specifically pressing for IIUBT. Let me discuss a few.

3.3   Further problems for IIUBT

There are many cases which the IIUBT seems unable to deal with. This is because IIUBT require the universals to be "multiply located", but there are many non-spatial entities and abstract entities to which the notion of *location* cannot be applied at all. For instance, it seems not implausible to talk about symmetrically arranged *angels*, *numbers* (i and $–i$), *symphonies*, and *Cartesian souls*. But it makes no sense to say these entities are all single bi-located bundles.

Even if immaterial and abstract cases can be dealt with via a wider notion of instantiation, problems remain for other material cases. Forrest (2010) invites us to consider a situation of "three qualitatively identical spheres arranged in a line, with the two outside ones the same distance from the middle one".

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It seems, argues Forrest, that IIUBT would first identify the two outermost spheres a and c. But then there remain two qualitatively identical spheres, so the identification must be done again which makes b also identical with a and c. However, the sphere b in the middle is clearly discernible from the two outside because of its *relational properties*. The middle one is "surrounded", and the other two are not surrounded. Thus, it seems that IIUBT does not only deliver counterintuitive results in the two-sphere case: it is also not clear whether we should identify the three spheres in two steps.

Let us anticipate some replies from IIUBT about these cases.

Firstly, it might be replied by the IIUBT theorist that the situation should be understood as one tri-located sphere (in a line *rather than a triangle*). But that does not explain (i) if the three spheres are supposed to be identical, why can the middle one be discerned? Again, it *is surrounded*, and the others are *not*; and (ii) *how* is the tri-location achieved? Of course, it can be a tri-located sphere at once, but nothing prevents it from being tri-located in two steps as Forrest suggests.[115]

Secondly, it might also be replied that there are not three spheres, rather, there is one scattered "1.5 sphere" which is bi-located. The subject of the bi-location is "one sphere and a half sphere". That is to say, there is only one bundle of a bi-located "1.5 sphere". If this is right, then we no longer have to say that there is something that has the property of being in the middle and being surrounded. But this strategy is too limited to be useful. Its (possible) plausibility is only due to the spheres are spatially extended. If we modify the case into three *pointy* things, then the idea of "a half point" makes little sense. More importantly, again, it cannot explain why a certain way of identification is preferred over others. If both Forrest's idea and this "semi-sphere" idea can achieve a situation where the three spheres are taken to be one bundle, why only choose one? Unless an explanation is given, IIUBT will still be incomplete because it is indeterminate about which steps of bundling are correct.

Thirdly, it might be replied that those different steps are just steps in *reasoning* rather than stages of some metaphysical mechanism in reality. For instance, although there are two ways to conceive the situation—it can be viewed either as one tri-located bundle at once, or two bundles made in two steps—they will deliver to us the same portion of reality. However, even if that is the case, this still shows that the view is *not ideologically parsimonious* because it gives us a strong epistemic indeterminacy in how to apply the various identification steps when reasoning about cases: suppose there are *four* spheres *abcd* arranged symmetrically: should we identify *ab*, and then *cd*, or *ac*, and then *bd* (in our mind)? Even if this is nonmetaphysical, we still need to have some ideological certainty which the IIUBT lacks.

In fact, that IIUBT has to deal with each case differently and piecemeal has already indicated that it is not a very systematic solution. If a better and more systematic explanation of distinction is

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[115] More seriously, the puzzle generalizes: consider four spheres *e*, *f*, *g*, *h*, which are arranged in a square such that they share all their relational properties. For IIUBT, it seems that they should say there is only one quart-located bundle of spheres. But again, IIUBT faces an unwelcome uncertainty, because the "single quart-located bundle" is not the only available answer which "recognizes the possibility". It could be one "single bi-located bi-located-bundle" as well, because the multiply-instantiated bundle itself is still multiply-instantiable. For the four spheres, the bi-located bundle itself could be instantiated twice more. So, it could be one single bi-located bundle. Thus, IIUBT must tell us: Is the one bundle one uni-instantiated bundle (which has been instantiated *four times*), or one bi-instantiated bundle (which has been instantiated *twice*). Those two descriptions are equally effective. Suppose each sphere has two universals U_1 and U_2; the situation can then be pictured as follows:

【*e* (U_1U_2)   *f* (U_1U_2)】 (the first instantiation of one bi-located bundle)

【*g* (U_1U_2)   *h* (U_1U_2)】 (the second instantiation of one bi-located bundle)

offered, it will be better than IIUBT. Now we can temporarily conclude that IIUBT faces many uncertainties, which again suggests that it is not as desirable as the new view, the InIUBT.

Note that what we are saying here is only that such an Instance-Identity View is better than both the Instance-View and the Identity Identity-View. It does not follow that the Instance Identity-View is the view we will eventually sustain. Some possible objections to the new theory are discussed in detail in my (2018). We cannot cover all the details here, but two problems which are common for almost all versions of bundle theory[116] need to be addressed. The first is the Non-property Challenge, and the second is about the notion of immanence. The next section is about the Non-property Challenge.

4.   The Non-property Challenge

We have argued that at least three versions of universal bundle theory should be distinguished and that InIUBT seems better than the other two versions. The aim of this section is to consider a more general problem for all of these versions of bundle theory: Why are certain properties in certain bundles and others not? In other words, what *determines* whether a property can be a property of the substance or not? Remember that the bundle theory does not have any resource *beyond the bundled properties* to answer this question, because fundamentally UBT should be seen as a one-category ontology. But it seems incorrect to simply say that *properties themselves* will sufficiently determine which properties are in the bundle. In Garcia's (2014, p. 118) term, this is the *Non-Property Challenge*:[117] "How do you go from there being properties, to there being a new entity that is itself an object and not a property?"

Some extra "object-maker" for bundle theory should be added, but it cannot be *too extra* to be an element for a bundle theory. In the literature, this is usually achieved by a detailed explanation of how the bundling relation(ship) among the properties works. There must be something within these properties to meet the challenge.

One popular explanation is "fusion" or qualitative mereological composition. It is claimed that for a traditional bundle theory, an object is the mereological fusion of properties. But, as Garcia

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[116] Benocci (2018) claims his "Repeatability Argument" can be used against *all versions* of bundle theory. But we will not focus on his argument here because it only deals with the IIUBT and he *stipulates* that the instance-view is *not* a bundle theory (p. 433 and p. 444). Also, it seems Benocci's definition of the *multiple instantiability* (repeatability) of a universal is problematic. He holds that a universal is repeatable if it is possible to be instantiated by *two concrete particulars*. But strictly speaking, this is not the kind of repeatability the IIUBT requires. To explain the apparent distinction of the spheres away, the IIUBT only needs to hold that universals are wholly located at two different places at the same time (which we will argue against in Section 5), but that does not follow the existence of any *further concrete particulars* which are not fundamentally universals. Finally, Benocci's argument rests on a very controversial inference from "x and y can instantiate *all* of the members of a set of universals" to "x and y can instantiate *all and only* the members of a set of universals" (p. 435). Nothing in the idea of a multiply instantiable universal justifies such an inference.

[117] Garcia finds three challenges for bundle theory, which he labels the "Gap challenge" because they all have some gap in explanation; but we will focus only on the Non-Property challenge.

(2014) argues following Williams (1953) and Paul (2002), there are good reasons to accept the following principle: *a fusion of properties must itself be a property* (PF),[118] which is a tacit principle at work in many nearby metaphysical disputes. But if PF is right, then fusions cannot be the object-maker for bundle theory. Because,

> The bundle theorist is trying to generate an object out of properties, and an object is not itself a property. But if PF is true, then any appeal to fusion […] will guarantee that the result is another property and not an object. Thus, an appeal to fusion by the bundle theorist, even as only a necessary condition, would seem to backfire as a strategy for meeting the Non-Property Challenge. (Garcia 2014, p. 119)

Thus, a bundling relation which makes properties into objects cannot be the *same* as fusion, because properties' fusions are still properties.[119]

Similarly, another popular candidate for the object maker in bundle theory is a certain *inter-dependence relation* holding between properties. For instance, Simons (2000, p. 153) argues that tropes[120] must be dependent upon each other rigidly.[121] Tropes cannot be there in isolation. They relate to each other by a certain *mutual dependence*. For Simons, what make redness and sphericity properties of a particular tomato is that there is a mutual dependent relation holding between them. So, it seems that such a dependence relationship can be used to make properties together into an object.

However, according to Garcia, this is little help because it also faces the same Non-Property Challenge. Garcia's argument against using dependence as the object-maker consists in two steps.

The first step is to argue that the mutual dependence of tropes gives us good reason to *identify* them. For simplicity, suppose sphericity 1 of ball B and hardness 1 of ball B are *mutually* rigidly dependent, meaning that sphericity 1 *guarantees* both that B is spherical and B is hard. Then the existence of one trope *alone* can guarantee that B is characterised in *every* aspect which is rigidly dependent on that trope. So, the observation is that the mutual dependency relationship cannot be held merely between *two* properties, and if all properties in the bundle must be linked by a dependence relationship, then once a single a property is fixed, the whole bundle will be also given. But if that is the case, Garcia argues,

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[118] It is important to note that in order to make the principles fully plausible, the "property" in the principle should only be qualitative. See Chapter 7 on haecceity mereology.

[119] Bundle theorists might bite the bullet and just accept that objects do not exist, but that is too much of a departure from our ordinary conceptual schema. Also, if the bundling relations are what arrange the properties into distinct bundles, then they help to fix the number of bundles that there are. But given that the fused properties or relations are themselves properties, the Problem of Distinction is still there.

[120] We have posited that the main target of this chapter is UBT. Here we just use tropes to illustrate how the idea of dependence works.

[121] See footnote 93 for a detailed definition.

> As a character-grounding constituent, sphericity 1 has the same content as hardness 1 (and any trope with which sphericity 1 is mutually rigidly dependent). But if sphericity 1 and hardness 1 have the same content, if they suffice to ground the character, then there is no need to maintain their distinctness. […] If B's character grounding constituents are mutually rigidly dependent, then postulating a plurality of such constituents would seem to be superfluous with respect to grounding B's character. (Garcia 2014, p. 122)

If mutual dependence is accepted, there is "no need to maintain their distinctness". Even if it might be replied that we do have *other* good motivations to believe in the components' distinctness (for instance, it can be used to explain differential similarity of objects), the real worry is that the mutual dependence relations themselves still look *ad hoc*. When we look at the nature of each property, it is unclear why they should entail the existence of each other. Hence Garcia's doubt about mutual dependence is reasonable.

Then it is not hard to see how the second step of the argument goes. If this reasoning is plausible, the mutual dependence relationship does *not* yield a new entity, and if its terms are identical, then the result of mutual dependence *is itself a trope*, and the interdependence of tropes makes the bundle itself a property. Thus, "Appealing to mutual rigid dependence, like appealing to fusion, generates the wrong kind of entity. Such an appeal will not help the bundle theorist meet the Non-Property Challenge" (Garcia 2014, p. 122).

Bundle theories may use other proposals including "co-instantiation relation", "compresence", "co-location", or even "structural universals", but they all face similar worries. And each may have their own further problems: for instance, if scattered objects are accepted, the properties of a bundle will not be in "compresence" at all because this requires properties to be in the same place at the same time. In short, appealing to these bundling relationships cannot help because these *relationships themselves only give us properties*. From properties, objects/substances cannot be made.

Given the richness and complexity of bundle theory, we are open to the possibility that there may be a better theory about the bundling relationship which allows the bundle theory to meet the challenge. But it seems our discussion above has cast enough doubt on the theory. Again, if other theories can do all we need without having this challenge of object-making, they should be preferred.

The Non-property Challenge has been discussed. Let us now turn to another important issue, the coherence of immanence.

5.   Problems of Immanence

So far, we have argued that (i) Rodriguez-Pereyra's instance-view is problematic; (ii) negative strategies which identify the spheres may face the worry of irrelevancy; (iii) there are two versions of the identity view that should be distinguished, with the Instance Identity-View seeming better than Curtis's Identity Identity-View; and (iv) most bundle theories need to meet the non-property

challenge. Now we will have a closer look at another idea which most bundle theories in this debate share, namely, that the universals are immanent.[122]

One reason why bundle theories require immanence is that Platonism, an alternative view of universals which takes universals to be transcendental, fits better with a relational than a constituent ontology (Van Inwagen 2011, 2014). But bundle theory seems by definition a constituent view, so the idea of immanence is very natural for bundle theories. However, we will now argue that immanence is highly dubious. Before that, it is worth noting that although our worry about immanence below may sound like a road to Platonism, that is compatible with the third mereology rule we will give in Chapter 7, which is similar to a weaker version of the Principle of Instantiation. A platonist can also accept that necessarily, every platonic universal must be instantiated. Immanence and the Principle of Instantiation should be separated.

5.1   Location and overlap

To repeat, immanent universals are universals *in re*, wholly present "in" each instance. According to all universal theories, a red tomato and a red apple are similar in color in virtue of sharing one universal, "being red". But most immanence theorists claim something more: they hold that the single universal "being red" is *multiply located* in the tomato and the apple at the same time.[123]

Is such an "immanence" sufficiently intelligible for explaining the distinction and identity of the spheres? We suspect not, because it would generate some counter-intuitive, even incoherent consequences. As Lowe argues,

> The relation being wholly in the same place as appears to be an equivalence relation and therefore a symmetrical and transitive relation, which poses the following difficulty. Suppose that tomatoes A and B exemplify exactly the same shade of redness and that this universal is both wholly in the same place as A and wholly in the same place as B. Then, it seems to follow, given the symmetry and the transitivity of the relation being wholly in the same place as, that tomato A is wholly in the same place as tomato B—which we know to be necessarily false, given the non-identity of A and B. (2006, p. 24)

Lowe thus points out that the "wholly located in" interpretation of "immanence" is unacceptable because it would entail that *any* things that share a single property are co-located. A relation like "being wholly in the same location" is symmetric and transitive, and if two tomatoes can both have the relation with the same universal redness, they will also be co-located. (As we argued earlier, co-

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location itself is not impossible, but it would be extreme to claim any two similar tomatoes *must be* co-located.)[124]

If we consider the meaning of "one universal is wholly located in two distinct tomatoes" *literally*, this means two tomatoes are partially *overlapping* in some sense. There is something called "universals" which bridges the two separate tomatoes, *spatiotemporally* linking them together. So strictly speaking the tomato on my table is only *partly* on my table, and has many other extended ("non-mereological?") parts in many other similar tomatoes. However, if things have universals generally, and if everything shares some universals (which is not impossible: all the objects in the next sentence share the property of extension), then any things could spatiotemporally overlap. (Note that in Chapter 7 we will see an innocuous sense in which everything overlaps but not spatiotemporally.) That is to say, my shoes overlap with Trump's hair and London overlaps with Mars… But the usage of the word "overlap" should not be distorted. That two distinct things share the same properties does not imply any mysterious *bridge* between those two things, let alone that they *literally* overlap.

Thus, the idea of immanence does not come cheap, because it seems to entail something odd about location and space.

5.2   The cart before the horse

Besides the implausibility of the notion of being wholly located in multiple instances, a deeper worry is *methodological*: assuming immanence in the debate about identity and indiscernibility seems to put the cart before the horse. Let me explain in detail.

Unintelligibility

To begin with, the following observation should be made: a theory of immanent universals is more counter-intuitive than Black's spheres-world. After all, conceiving a world where there are two similar spheres seems much *easier* than conceiving the same universal being located at two locations at the same time. Ask anyone without a theory on the street: "Can you conceive a world with only two spheres?" Most would answer in the affirmative. But if we ask: Can you conceive something which is *both here and there at the same time*? it is not clear that most would say yes. But that is precisely what most immanent universal theories require: the universal is co-located with its instance which instantiates it, namely, it is "wholly located *in* the same place as" its instance!

Worse, as we will see, immanence may also make bundle theories' "solutions" in our context either circular or redundant.

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[124] Again, the "wholly locating" idea is widely assumed by *almost every* immanent theorist. One exception is Moreland (2001, p. 98), where he holds instantiation could be non-spatial. But unless a detailed theory of instantiation is given, his theory still faces our worry in Section 5.2.

Circularity

It may be *circular*, because to understand immanence we are required to understand a case where one property can have two instances, but that would be exactly like conceiving one bundle of universals has two bundle instances, or, more directly, one sphere being located twice. Someone may ask: "How can the two spheres be bi-located?"; and the reply comes: "Because a universal can be bi-located". But it seems that if we have already understood *how* a universal can be bi-located,[125] then we will also have understood *why* a bundle of universals (the sphere), can be bi-located. (After all, "universals" are more theoretically abstract than "spheres".)

Put the idea in a slightly different way, the answer to the question "Why and how can two instances be distinct *instances* when they are both based on the same *universal*?" appears *no more* obvious than the answer to the question, "Why and how can two *spheres* be distinct spheres when they are qualitatively indiscernible?"[126] An answer to the second question will circularly presuppose the answer to the first question. Assuming the intelligibility of immanence in the first place would make the puzzle of distinct indiscernibles trivial. Asking how two qualitatively indiscernible things could be distinct is like asking how immanence is possible. If there is a puzzle about the distinction of "indiscernibles" at all, the same applies to immanence.

Redundancy

On the other hand, using immanence in this debate may make bundle theory redundant in solving the PoD. With the notion of immanence alone, we may understand the whole bundle as one thick, single universal: why then do we need the *bundle* at all? In other words, if any version of the UBT is useful in explaining the spheres case, it is *in virtue of the nature of the universals*, not the unclear relation of 'bundling', that the theory is workable as a solution to PoD, whether positive or negative. If we take the two spheres to be two spheres sharing one big structural universal, then no theories about the bundling relation would be needed at all.

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[125] This also suggests that, especially for the *instance views* of bundle theory, they also face the Revenge Problem, as we mentioned in Chapter 3: the distinction of the two instances itself also needs explanation, otherwise it sounds like primitivism again.

[126] In fact, if Duns Scotus is interpreted properly, one of his main ideas is that a haecceity should be the origin of *instantiation*: a haecceity makes a universal "troped". So, for haecceity theory (see Chapters 6 to 9), we may even assert that the answer to the question of how a universal can be instantiated is the just *the same as* why two spheres are distinct. Both are due to haecceities: a universal can be multiple instantiated by different substances in that it can be a part of *more than one haecceitified fusion*. In other words, our diagnosis is that most bundle theorists do not analyse instantiation and immanence seriously, which is also a potential problem. Even if, as many constituent otologists hold, instantiation can be analysed in terms of parthood, clearly not all kinds of parthood are instantiation: redness is a part of the fusion of redness and blueness, but it is not instantiated by the fusion. In contrast, if redness may be a part of the fusion of a haecceity (of an apple, for instance) and some other universals, then we can say redness is instantiated by that apple.

6. Conclusion

In this chapter, we have argued the following things: (i) there are three versions of UBT, the Instance-View, the Instance Identity-View, and the Identity Identity-View, and the Instance Identity-View is better. (ii) All these versions need to show how something which is not an object can be an object, given that properties' fusions are also properties. And (iii) in explaining the spheres case, all these versions rely on the assumption that universals are immanent and can be wholly located in each instance. But if what we said above is accepted, then immanence is problematic because it will deliver counter-intuitive results about co-locating, and it is methodologically circular in that the fact that a universal can be multiply located is no more obvious than the fact that there can be two qualitatively indiscernible spheres. If immanence is given up, then all versions of the UBT would be unsatisfactory. Immanence should not be assumed in solving the Problem of Distinction.

If our arguments are sound, then we should say that UBT (especially the IIUBT version) cannot solve the Problem of Distinction, even as a "negative solution". No matter whether there are competing descriptions of the *same* data, the theory which gives the interpretation that the two spheres are only one bundle of universals will face serious problems. This does not deny the possibility of a more promising bundle theory in future, but as far as the sphere case, and the Problem of Distinction in general, is concerned, the various extant bundle theories are not satisfactory. We had better look for something quite different.

PART II

THE ONTOLOGY OF HAECCEITIES

Chapter 6
Haecceities and the Problem of Distinction (A)

We have argued that various positive and negative solutions to the Problem of Distinction have failed. This chapter will show how haecceities can help.

Firstly, we outline some key features of haecceities and show how they are supposed to solve the problem. We will also give a general picture of our intended ontology which will be developed in next few chapters. Secondly, we evaluate this solution according to some of our principles by showing its advantages over previous failed solutions. In doing so, we reply to some objections to haecceities in the literature. (Later we will also develop a novel theory of haecceity itself, but this chapter mainly considers the Problem of Distinction.)

For ease of reading, we divide this chapter into three main parts. In this part, we define what haecceities are (Section 1) and argue that the haecceity solution to the PoD is both necessary and sufficient (Section 2), and is not faced with categorical circularity (Section 3) or the pairing problem (Section 4). We also argue that the haecceity solution can solve the general Problem of Distinction (Section 5), before providing a short conclusion (Section 6).

1.   What are haecceities?

Despite having various meanings in the history of philosophy, a haecceity in the literature today is understood as some *sui generis* "particular, primitive, purely non-qualitative property of an entity" (Ingram 2016, p. 2867). In a Platonist context, Vallicella (2010) defines a haecceity as follows:

> Suppose properties are abstract and necessary, and can be non-exemplified, then a haecceity is a property H of X such that, firstly, H is essential to *x*; secondly, nothing distinct from *x* exemplified H is the actual world; thirdly, nothing distinct from *x* exemplifies H in any metaphysically possible world.

In a modal context, "X is a haecceity of Mary" can be written as $\Box \forall x$ (X*x* ↔ *x*=Mary). If, necessarily, for any *x*, if *x* has some X, then *x* is identical with Mary, then X is the haecceity of Mary. More generally, following Williamson (2013, p. 268), "X is a haecceity" can be written formally as $\Diamond \exists y \Box \forall x$ (X*x* ↔ *x*=*y*).

> The haecceity is unique, in the strong sense that necessarily for every haecceity of *y*, *y* is necessarily coextensive with it. […] Furthermore, a haecceity determines a unique individual, in the strong sense that necessarily if X is a haecceity of something *y* then necessarily X is also a haecceity of something *z* only if *y* and *z* are identical. For, necessarily, whatever X is a haecceity of has X, and X is a haecceity of *z* too only if whatever has X is identical with *z*. (Williamson 2013, p. 268)

Similar definitions can also be seen in Adams (1979, 1981, 1986), Rosenkrantz (1993), Lycan (1994) and Diekemper (2009, 2013, 2014). Canonical expressions of a haecceity include: the property being

identical with *x*, or being *x*, or *x*ness, where *x* is a proper name. More details will be developed in due course, but for now let us note the following five features of haecceities:

Particularity: A haecceity is a non-concrete particular in that it cannot be instantiated by more than one entity.[127] Unlike bare particulars (see Chapter 4(B)), the "particularity" of a haecceity does not make it belong to a unique category like "particular substances".

Property: A haecceity is a property, or, more accurately, a special universal which can be instantiated at most by one instance. It is not a dynamic process, event or a complex substance (as some philosophers including Pierce and Heidegger historically took it to be).

Simplicity: A haecceity is simple in that it cannot be further divided into parts. And it is not constructed from the identity relation plus the entity. The haecceity of Socrates does not have Socrates as a constituent in the usual sense. We cannot get Socrateness by simply plugging Socrates in the blank of "being identical with ___" (Rosenkrantz 1993, p. 116).[128] As we will see later, this feature is important if we are to use haecceities to solve problems.

Non-qualitativity: Sometimes, qualitative properties are also called "suchness", and "all properties that are, in certain sense, general *and* nonrelational are suchnesses" (Adams 1979, p. 7). A haecceity is at least not general, so it is non-qualitative.[129][130][131] Other non-qualitative properties may include the property being identical with redness, which is different from the property being red or green, because only in the latter case is the redness used predicatively. (Cf. Russell's (1903, pp. 43-46) distinction between a term and a concept; see also Carmichael 2016, p. 5.)

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[127] Being a particular in itself does not necessarily make it unshareable. For instance, there is nothing contradictory in saying a particular trope is *transferable*, even though we have already discussed the serious problems which attach to this idea. In this aspect, a haecceity is somewhat similar to non-transferable tropes, but as we will see later, tropes will be derivative if we have haecceities and universals.

[128] As Rosenkrantz (1993, p. 116) says, the constitution view "is of questionable coherence … how does a concrete entity plug into the identity relation, an abstract entity?"

[129] "More precisely, let us say that a basic suchness is a property that satisfies the following three conditions. (1) It is not a thisness and is not equivalent to one. (2) It is not a property of being related in one way or another to one more particular individuals (or to their thisnesses) […] (3) A basic suchness is not a property of being identical with or related in one way or another to an extensionally defined set that has an individual among its members, or among its members' members…" (Adams 1979, p. 8). Note that these conditions are only for basic suchness, and nonbasic suchnesses can be constructed from the basic ones.

[130] Note that we are not saying haecceities are relational (e.g. Pierce (1868) holds that a haecceity is a "*secondness*" which can only be experienced via relation). They can definitely be relational in language, but not necessarily so in reality. See more below.

[131] The distinction between qualitative and nonqualitative is not easy to analyse. Adams (1979, p. 7) holds that a property is "purely qualitative—a suchness—if and only if it could be expressed, in a language sufficiently rich, without the aid of such referential devices as proper names…", although it is not clear that whether in every case we have to express haecceities with referential devices. For instance, we may express haecceities without names by "the property being identical with whatever has it". For other discussions on the distinction of qualitativity and non-qualitativity, see Stalnaker (2012) and Cowling (2015). Here we assume the distinction can be made clear and useful enough to work with. One intuitive way to understand it is via *duplication*. Qualitative properties are duplicable (Carmichael 2015, p. 6). Note even if the distinction between the qualitative and the nonqualitative is given up, it still will not undermine haecceities directly. One noticeable exception is Pickavance (2008), who explicitly suggests that haecceities are also qualitative. But it is not clear how his haecceity is different from others in spirit.

Essentiality: It is quite common to compare haecceities with Plantinga's (1979) individual essences. Suppose that P is an essential property of *x* if and only if, necessarily, if *x* exists, then *x* exemplifies P; P is an individual essence of *x* if and only if P is (i) an essential property of *x* and, (ii) necessarily, for all individuals *y*, *y* exemplifies P if and only if *y* is numerically identical to *x* (cf. Menzel 2015: §4.1.2).[132]

Haecceities are like individual essences in many aspects, but some individual essences are not haecceities.[133] For instance, the property of being identical with Socrates and 2+2=4 is necessarily and uniquely had by Socrates in the sense of individual essence defined above. But that property itself is not the pure haecceity.

Also, note that in certain contexts, if individual essence is understood as the collective qualities (in the Leibnizian[134] rather than the Scotus sense) which make a thing the thing it is, then a position which accepts haecceities can be misleadingly called "anti-essentialist" (Cowling 2015, section 3): friends of haecceities can reject rationality or humanity as the essence of Socrates. But that does not mean the haecceity fails to meet the above definition of individual essence.

The above five features should be accepted by most friends of haecceities. There are, however, more controversial issues. For instance, can haecceities be uninstantiated? Some argue that if haecceities exist at all, they must be instantiated (Markosian 2004), while others argue that sometimes a haecceity can exist without being instantiated (Rosenkrantz 1993, Ingram 2016). Also, is the number of haecceities determined? Can two haecceities compose a third one? We will be neutral on these issues for a moment, coming back to them when exploring the humility of haecceitification and its mereology. But it would be helpful to have a rough picture in mind. In short, our intended ontology is as follows:

First of all, a haecceity is a special property which "carries" the information we need to build up a complete substance.[135] It provides the unity of a substance. We will explain the notion of unity in the problem of indivisibility.

Secondly, we take a substance to be a special mereological fusion of its haecceity and relevant qualities. The haecceity will "haecceitify" some qualities to make a substance, that is, it can turn a universal into instances. There may always be a fusion composed by a haecceity and any

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[132] Note this characterization is just a clarification of essential properties. It does not entail an analysis of essences in terms of modality, which is quite controversial.

[133] There are some terminological issues here. Some take the terms like thisness, haecceity, and individual essence to be synonymous. But in his "moderate haecceitism", Adams distinguishes thisness from haecceity: only the latter can be uninstantiated and independent. And in personal communication, Swinburne also says that he thinks it makes sense to say two entities have the same *individual essence* but it is not possible to say so for haecceity. Unless stated otherwise, we will stick with the term "haecceity".

[134] Leibniz holds that "an individual is individuated by its total entity (*omne individuum sua tota entitate individuatur*". See Mugnai (2001).

[135] It is very tempting here to use the analogy from biology: some tRNA (Transfer Ribonucleic acid) carry the amino acid to the ribosome to make protein. There are specific tRNA for each codon and amino acid.

qualities, but only some fusions are substances and it lies in the nature of haecceity itself that it can "choose" which qualities to haecceitify. In other words, if the qualities *match with the information* carried in the haecceity, then haecceitification will be done and we will have a correspondent substance.

Thirdly, such "matching" or haecceitification is a primitive notion, although we will argue that it is metaphysically necessary.

Finally, although we will begin with our common intuitions from ordinary life, we still hold a certain *humility* as regards to what *concrete cases* of haecceitification can be found in the actual world.

Now it is clear how haecceities can help to solve the Problem of Distinction. Why are there two distinct spheres? The answer is straightforward: because *there are two distinct haecceities of the spheres*. Let us see how this overcomes the problems of previous solutions according to our principles of evaluation.

2. Sufficiency and necessity

Any solution to the PoD must be both sufficient and necessary. Let us begin with sufficiency.

2.1 Sufficiency

The solution with haecceities is sufficient: if there are two haecceities of spheres, then the number of the spheres must be two. It cannot be one or more. Compare this with the failed solutions like tropes where, as we have argued before, if there are two "seemingly incompatible" tropes from the same determinable, it is still indeterminate whether they are instantiated by two distinct substances or one extended simple. The same problem occurs for the spacetime solution because it seems one substance can occupy more than one spatiotemporal point. But the worry does not exist if there are two haecceities: it is impossible to say one substance, extended or not, has two haecceities. This is entailed by the formal definitions we gave earlier. The solution of tropes (or spacetime points) fails to guarantee the distinction of spheres because the relation between spheres and tropes (and spacetime points) themselves is not *intimate* enough.

By contrast, as we will also discuss later, haecceities are usually taken to be the hallmark of substances,[136] and they are supposed to be responsible for their unity: they account for the numerical "oneness" and distinction of spheres. Under this understanding, whether substances are "minimally

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[136] For instance, Paul (2013, p. 109) writes, "We should reject the substance category itself, for once we reject haecceities, substances aren't doing any work that can't be outsourced." We do not embrace Paul's own ontology, but her line of reasoning itself seems right: if we do believe substances have any unique role in our theory, haecceities should not be rejected. This may sound very strong because clearly there are many substance theorists who do not believe in haecceities. But that only shows what *is* the case rather than what *should* be the case. One main purpose of this thesis is to argue that, if we do have substances at all, then we *should* take haecceities seriously, otherwise there are unsolvable problems.

reduced" into "haecceities and qualities" remains open for later discussion (see Diekemper 2009). At any rate there can be a clear sense in which there is a one-to-one correspondence between a haecceity and the individual substance it actually individuates, or could individuate (Williamson 2013, p. 268). *If a substance is individuated as one substance at all*, it should be individuated by one and only one haecceity. In the spheres case, the number of haecceities goes together with the number of the spheres, but how many tropes there are cannot determine the number of the spheres. This is why haecceities can pass the sufficiency test while tropes cannot. Thus, if the solution of haecceities is sufficient, it cannot be the case that one substance can have two haecceities.

Recall our analogy in Chapter 2: in looking for an explanation for the fact that there are two substances, we are like detectives who need to infer the number of criminals from some given evidence. Given there are two hats, we cannot conclude that there are two criminals because one person can wear two hats; but we can make a reliable inference if the evidence is two different blood types because one person cannot have two blood types. Similarly, given two tropes or two spacetime points, there is no metaphysical guarantee that they are not had by only one substance. But a haecceity is unique to each of its possessors. They are the "metaphysical DNA" of substances.

It is not right to object to this by saying that it seems intuitive to say that the two distinct spherical substances can *compose a third* scattered substance, and hence it seems possible to say there is a scatteredly shaped substance having the two haecceities of the two spheres. This is mistaken because if there is really one scattered substance at all, then each sphere "in that big substance" would not be a genuine substance. An analogy: two *persons* can compose a third *entity*, but that third entity is by no means a *person*.

There are many reasons for thinking like this. One concern is that substances are *independent*: the existence of one does not require the existence of other substances. And one aspect of this independence is the *simplicity* of substances: a substance cannot have other parts which are also substances themselves. Substances do not have substantial parts, parts which are also substances. As Heil puts it,

> It is none too easy to see how a substance could be complex. […] Ascribing a property to it, to the complex, as opposed to the substances making up the complex, has the aura of a category mistake. The thought here is that the sense in which a simple substance bears a property –the substance is some way or other—*does not extend univocally* to complexes made up of substances standing in particular relations. […] Substances are mereologically[137] simple. (2012, pp. 20–21)

Heil's idea is that the way a substance is, is quite different from the way a complex entity is. (Note that this comment alone does not entail that substances cannot be extended or scattered, even if one

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[137] Note that the "mereology" Heil means here is very restricted. He does not deny that a substance can have, for instance, spatiotemporal parts. The point is no matter what parts a substance can have, these parts cannot be substances.

ideal candidate for substances so defined might be fundamental physical particles.) We will come back to this point again when discussing the problem of indivisibility and one rule of haecceity mereology. For now it is enough to say that if there are two distinct haecceities, then we can be sure that there will be two distinct substances.

2.2 Necessity

We have argued that the haecceity solution is sufficient for the distinction of the spheres; now we will argue that it is also necessary. If the distinction of the two spheres has an explanation at all, they must differ in their haecceities because the two spheres share everything else. Compare this with the failed solution with spacetime points. As we argued in Chapter 4, two spheres *might* be distinct in their spacetime locations, but they *do not have to be*: it is theoretically possible to have two distinct spheres co-located. The spacetime solution cannot explain the distinction of the co-located spheres, and it also lacks the resources to deal with cases like non-spatial or non-temporal indiscernible entities.

By contrast, haecceities can treat distinctively located spheres, co-located spheres, and even non-spatial and non-temporal entities in a unified way: they are distinct because there are distinct haecceities of them. As said, if haecceities provide the unity of substances, then there would be a one-to-one correspondence between a substance and its haecceity. Thus, if X and Y are distinct substances, then the property of being identical with X and the property of being identical with Y must be two distinct haecceities. These two haecceities are distinct *not* because they have distinct *constituents* X and Y, because, as we will see, we have good reasons for not thinking that the haecceity is merely a combination of identity and a substance. Rather, when X and Y are two distinct substances, the haecceity of X and the haecceity of Y are distinct because the number of all substances (possible and actual) and the number of all haecceities should be the same.

It is not right to object that it seems possible to have two things which share one haecceity. For instance, it might be said that one sphere and one of its halves are distinct, but according to our theory there is one haecceity for only one sphere. Then it seems one haecceity is somehow shared by two substances. However, this is not an effective objection, because the relation between one sphere and one of its halves is mereological, rather than the relation of being *independently distinct.* Again, substances are independent. But either the whole sphere depends on the two halves or the two halves depend on the whole sphere. If, as we have assumed all the way along, the one sphere is a substance, then we cannot treat its two halves as substances too.[138] A sphere and one of its halves at most gives us a case in which two *overlapping things* can share one haecceity, rather than a case in which two

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[138] On the other hand, if the whole sphere depends on the two halves, then the two halves will be substances (properly arranged) and they are all we need in making reality, which means we only need to admit two basic substances instead of three. And the Blackian universe would be a universe with four substances rather than two.

substances can share their haecceity. If one sphere has one haecceity, then its half has at best the same haecceity in a derivative sense.

3. No categorical circularity

We have argued that the haecceity solution is necessary and sufficient, so let us turn to some other principles. The Principle of Non-Circular Individuation says that an explanation of a distinction fact must look for entities from a distinct category. Since haecceities are properties and (given our rejection of bundle theory in Chapter 5) properties are a distinct category from the two spherical substances, using haecceities to explain the distinction of the two spheres obeys the principle. Compare this with the solution with bare particulars: as we have argued, bare particulars are similar to haecceities in various ways, but there are still differences: for instance, bare particulars cannot be instantiated, and they seem to evoke two notions of instantiation. Moreover, the bare particular solution breaks the principle: bare particulars are of the category particulars (in this context, substances or spheres). The very distinction between a bare particular and the particulars whose distinction is itself explained, also needs explanation. This makes the haecceity solution preferable.

4. No problem of "which is which?"

But the worry of circularity has other facets which we need to deal with more carefully. There is a popular objection against haecceities in the literature. Consider two haecceities, being identical with Socrates, and being identical with Plato. Our story says that the two haecceities explain the distinction of Socrates and Plato. But, the objection goes, how are the two haecceities themselves metaphysically distinguished unless we assume the distinction between Socrates and Plato in the first place? "Which haecceity is it?" "It is a haecceity *of Plato*". That is, the distinction of the two haecceities seems to assume the distinction that needs to be explained.

The reply lies in a clarification of the nature of the Problem of Distinction as we set out in Chapter 2: the problem is not a pairing problem. Given the existence of two haecceities, and two philosophers, which is Plato and which is Socrates? Or which haecceity tracks which philosopher? Rather, the problem is, how is it possible that there are distinct two substances with indiscernible qualitative properties? The solution is simple: because there are two haecceities. This solution does not say anything about which haecceity is which. The objection of circularity above misunderstands the dialectic.

A helpful distinction to draw here is between a principle of individuation and a criterion of identity (Lowe 1998, 2003, 2009, 2016). Things with criteria of identity have a *determinate identity*; and things with principles of individuation have a *determinate countability*. Ordinary entities (real individuals) have both a principle of individuation and a criterion of identity. But these two things are not inseparable.

> What we *lack* in the case of the concept of a mere part of gold is any principle of individuation for the items falling under the concept. […] Such principles must, however, be carefully distinguished from what I have been calling criteria of identity. What I am contending, indeed, is that the concept of a part of stuff (quite possibly) *does* convey a criterion of identity for its exemplars, but *not* a principle of individuation. (Lowe 1998, p. 201)

Lowe argues that some entities (he calls them "quasi-individuals"), like two entangled electrons, merely have determinate countability without determinate identity, because there is no further analysable content in their identity, namely no way to distinguish them by further qualities. (This is like "matterless form".) We can say, for these electrons, that *they* are precisely two and distinct, but there may be no matter of fact as to whether electron *a* and electron *b* are distinct because, as assumed, we cannot metaphysically "identify any distinct subset of {*a*, *b*} which possesses one rather than the other of the electrons as its sole member" (Lowe 1998, p. 198).

By contrast, some other entities, like some portions of gunky stuff (Lowe calls them "pseudo-individuals") such as gold, can be said to be identical with or distinct from other portions of gunky stuff, like water, but they are not countable by themselves.[139] They have determinate identity but no determinate countability. (This is like "formless matter".) Later, Lowe further clarifies,

> A criterion of identity tells us what **determines** whether an object belonging to a given ontological category is or is not identical with another such object. […] We are concerned with identity conceived as a **relation**, whereas in the case of [principle of individuation], we are concerned with "identity" in the sense of **individual essences**. (Lowe 2009, p. 31)

The principle of individuation takes "identity" as individuality, while the criterion of identity takes "identity" as more like a relation, which is usually expressed in the form *x=y* iff R*xy*, where R is a relation standing for a material condition *x* and *y* has to meet in order to be identical.[140] Taking identity in "criterion of identity" to be "relational" entails we need to find something *beyond the entities themselves* to *connect* them in order to see their identity and distinction, which enables us to carry on the pairing operation and hence solve the problem of which is which (see Chapter 2). When Lowe says it is coherent (even if not true) to say that two electrons only have principles of individuation rather than a criterion of identity, he means there is nothing at all to *determine* which electron is which, and especially that no pairing operation can be metaphysically carried out because these two electrons could be only distinct holistically.[141] We do not need to distinguish them by

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[139] Note that a *ring* of gold is still countable, but that is in virtue of the fact that a "ring" is a spatial notion and countable.

[140] According to Lowe, whether such a relation is always non-trivially available is another question. When such a relation does not exist, we can still talk about "identity conditions" in general, but not "criterion of identity".

[141] It is noteworthy that the nature of a criterion of identity itself is a deep metaphysical issue. For instance, there is a question about whether all criteria of identity are one-levelled or two-levelled. Here we will try to be as neutral as possible. We only need to make sure that the notion of a criterion of identity has a natural connection with the problem of which is which. For other details, see Williamson (1990), Lowe (2012), Burgess (2012) and Fine (2016).

names. But this holistic distinction of the electron itself may or may not be further explained by another holistic distinction of the haecceities ("individual essences" in Lowe's term). And these haecceities do not have to be separately assigned distinct names and paired up with the individuals. Then, we might say, for quasi-individuals like electrons, only the problem of countability can make sense; and for pseudo-individuals like mere parts of gold, only the problem of which is which can make sense.[142]

Now it should be said that the Problem of Distinction mainly asks about countability, rather than the criterion of identity. Again, a criterion of identity gives the things "determinate identity" rather than "determinate countability". In our context, to metaphysically "determine" their identity simply means to determine which is which, namely, to solve the Pairing Problem. But if Lowe's distinction is right, to explain why two things are two in number does not require us to provide these two things' "determinate identity"; rather, that needs to be explained in their countability. Two haecceities explain why there are two spherical substances, rather than which sphere has which haecceity.

5.   Haecceities can deal with the general cases of distinction

We argued before that the Problem of Distinction is not only limited to the special cases of distinction, because the distinction pairs composed by ordinary objects also cry out for a thorough explanation. For instance, as shown in our argument against tropes, tropes cannot be used to differentiate Blackian spheres, and they may also fail to differentiate other non-symmetrically arranged entities. For instance, if it is said that an apple and a banana are distinct because the apple is red and the banana is yellow, then the following problems arise as we discussed in Chapter 2 and Chapter 4,

(1)   Why not say there is only one distributional property *being-red-here-and-being-yellow-there*?

(2)   How are we to distinguish redness from yellowness? As we argued, here we will be caught either in a *regress* of higher-order properties or a *circularity*.

(3)   It is not enough to change the strategy a little and say the apple and the banana are distinct because one has red and one does *not* have red. On the one hand, on what grounds we can make judgements about *negativity*? On the other hand, again, why cannot there be a distributional property which is like "being-red-here-and-being-non-red-there"? (This is not a pure negative property that can be easily dismissed.)

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[142] Again, we are not making a scientific claim that electrons should have haecceities, but merely saying it is possible to think so without violating the fact that these two electrons are qualitatively indiscernible. The "hidden variable theory" may not be popular for many physicists today, but it is coherent.

(4)   As we have argued before, the redness and yellowness can be had by one *extended simple*. Given one red trope and one yellow trope, it is still indeterminate whether they are had by one extended simple substance or two distinct substances.

Our purpose here is not to address all these issues, some of which have already been discussed in previous chapters; rather, the point is that, allowing for all of these subtleties, the virtue of believing in haecceities is clear. Note, again, that the problem is not which is the apple and which is the banana; rather, the key problem is: why are the apple and the banana distinct? Then the haecceity solution is simple and straightforward: because there are two haecceities, which is of exactly the same form as the solution in the symmetrical sphere cases.[143]

This can also be seen when immaterial substances are considered. Spacetime theories and traditional universal-bundle theories cannot deal with cases like angels, numbers and Cartesian souls, because these cases can also be said to be indiscernible. Here assuming materialism from the outset is *ad hoc*. In fact, Swinburne (1995) argues for the existence of haecceities exactly because he takes *immaterial* entities as more fundamental. But if haecceities are accepted, all kinds of cases become clearer and amenable to uniform treatment.[144]

6.   A short summary

We began by outlining the key features of haecceities: haecceities are particulars, properties, non-qualitative, essential for individuals, and structurally simple. Then after comparing the haecceity solution with other solutions which for various reasons are either insufficient or unnecessary, we argued that haecceities are sufficient and necessary for explaining the distinction of the two spheres. We also argued that the haecceity solution faces no problem of categorical circularity, nor the problem of which is which. Finally, it can solve all the cases of distinction in a uniform way.

In next part of this chapter we turn to another important issue: whether using haecceities to individuate substances is circular, since it seems haecceities cannot exist without their individuals.

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[143] This is even clearer when we compare it with one *potential problem* the universal bundle theory may face which we did not mention before: the problem is it seems that UBT must offer us a non-arbitrary way to distinguish the (apparent) symmetrical cases of distinction from the non-symmetrical cases of distinction because only the former ones are to be claimed as numerically identical according to UBT's own strategy. But such a non-arbitrary way is hard to find because under certain descriptions, the apple and the banana could be viewed as symmetrically indiscernible. By contrast, the haecceity solution does *not* need to find such a non-arbitrary way to differentiate the symmetrical case from the non-symmetrical case at all.

[144] Haecceity may even help to find a *uniform treatment* for fermions and bosons in physics because if both fermions and bosons have haecceities, then *having-distinct-haecceities* is true for both of them. See the debate between Saunders (2006) and Hawley (2006). Since this will lead us to issues in the philosophy of science, we will not go into the details.

Chapter 6
Haecceities and the Problem of Distinction (B): Haecceities without individuals

In the last main section, we argued that the haecceity solution is necessary and sufficient, and that it also meets many of the other principles of evaluation which we laid down, and thus is preferable compared with many other positions. We also argued that the solution does not have to tell us which haecceity is which. But there is another related worry: even if we do not have to *distinguish* the two haecceities in explaining the distinction, we may still need to explain how the haecceity of Socrates relates with Socrates, if the haecceity is supposed to individuate him. But how could there be a property of Socrates, being identical with Socrates, *before* Socrates himself gets individuated?[145] Here we come to one of the most common complaints levelled against haecceities, the Circularity Problem: Do we not need to *assume* the individuality of what is to be individuated before a haecceity can individuate it? It seems haecceities cannot exist without the individuals they individuate.

This kind of circularity problem is not a single and unified objection: rather, it covers a family of problems. We will summarize some of the most representative ones in the literature and defend haecceities from each of them. Section 1 addresses Adams' intelligibility worry; Section 2 is about whether a haecceity is a relational property; Section 3 deals with Williamson's tracking problem; Section 4 gives some possible explanations for why some may find the individuation of haecceities to be circular; Section 5 argues that, even if there is a genuine circularity in the definition of haecceity, that circularity is not vicious because it can still be informative.

1.   The intelligibility worry

Let us begin with Adams (1981), who objects to haecceities as follows when discussing modal actualism,

> It is not easy to say what haecceities would be. That is indeed the chief objection to them. Suppose H*
> is my haecceity. What would H* have been if I had never existed? It would be misleading at best for an
> actualist to claim that H* would have been my haecceity in that case, for he thinks there would have
> been *no me for it to be related to*.
>
>   But one might hold that H* would have been something that could have been a haecceity of an
> individual, and that could not have been a haecceity of different individuals in different possible
> worlds. That would fit it to *represent* me in worlds in which I myself would not exist. Likewise, it

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[145] A subtle point that should be acknowledged here is that the worry discussed in the following section cannot by itself undermine the success of the haecceity solution to the Problem of Distinction, because it is controversial whether identity/distinction facts are grounded in existential facts (Burgess 2012). It might be the case that, even if having a haecceity presupposes the thing it individuates, it does not follow that the *distinction* of haecceities presupposes the *distinction* of the things these haecceities individuate. But since we need to use haecceities to understand the unity of substances as well, the possibility of a circularity between a haecceity and its individuating entity itself is still an important question.

might be claimed that there are infinitely many such entities in the actual world, deputizing here for individuals that would exist in other possible worlds. But what would these entities be? (1981, pp. 12-13)

There is a lot going on here. One thing that will become clearer later is that we do accept the possibility of uninstantiated haecceities (with a proper mechanism of instantiation). Now we will pay attention to two points made by Adams: firstly, a haecceity of me would be hard to understand if I had never existed; secondly, if a haecceity is "something that could have been a haecceity of an individual" and there are many such haecceities, it is still hard to understand what a haecceity is.

But it is not clear whether these count as objections at all. Pickavance has adapted Adams's quotation with the case of colour to defend the notion of haecceity.

> It is not easy to say what colours would be. That is indeed the chief objection to them. Suppose G is the colour of green things. What would G have been if green things had never existed? It would be misleading at best for an actualist to claim that G would have been the colour of green things in that case, for he thinks there would have been no green things for it to be related to. (2008, p. 53)

As Pickavance points out, no one should be convinced by such an argument against colours. If haecceity is rejected for this reason, then colour should likewise be rejected. It might be replied that the greenness can be further analysed in an informative way, perhaps by saying it is evoked by light with a certain wavelength. But again, what is light? What is wavelength? It seems our concepts are understood through usage and practice systematically related with other concepts. It is hopeless to seek a fundamental and primitive definition of everything in isolation. Likewise, haecceity, as a *theoretical notion*, has been clearly defined through its role in theoretical tasks and it can only be understood alongside other notions like universals and substances. Yet being *empirically* empty does not mean it is totally empty: we can assert a lot of different and substantive truths about haecceities.

2.   The relational worry

More charitably, it might be said that Adams's argument does not concern the unintelligibility of the notion of haecceities; rather, it is that using haecceity to individuate Socrates is circular. Markosian makes the similar point,

> I have a hard time understanding how Socrates could fail to be a constituent of Socraticity [i.e. Socrates's thisness], although, admittedly, what we say about this matter depends partly on what we say about the tricky subject of the nature of constituency. In any case … it seems clear to me that this principle will be true: The property of being identical with *x* exists only if *x* itself exists. For it seems to me that, for any relation and for any object, **the property of standing in that relation to that object will exist only if the object exists**. (2004, p. 56)

We have set the key point in bold. However, the intuition that the property being identical with Socrates must assume the existence of Socrates to exist is misleading. It is simply incorrect to

say "for any relation and for any object, the property of standing in that relation to that object will exist only if the object exists". (This is different from saying "a relation to that object will exist only if the object exists".) Haecceities are simple and structureless: they are not a product of the combination of an identity relation and an individual. In fact, it is dubious enough that we can take identity in general as a "relation".[146] "A=A" can be read either as expressing an identity fact about A, or as expressing that A has the property "=A". It is only in the former reading that we need to take identity as a relation. Note that we are not denying the truism that any relation's existence seems to require the existence of its relata: if a haecceity of X gets instantiated at all, there could be an (internal) "relation" between the property being identical with X, and X, namely, instantiation.

A variant of the worry can be put like this: We cannot fully grasp the essence of "being identical with Socrates" without making reference to Socrates. If Socrates does not exist, the referent of the term 'Socrates' seems empty. Paraphrasing this in terms of our ontology, when 'Socrates' refers to a combination of qualities and haecceity, then to understand what Socrates' haecceity is, it might be argued that we must again refer to its "possible resultant entity", the full-blown Socrates.[147] However, why could not we simply reject the dogma that to understand something's nature we must assume its real existence? Even if the essence of the property "being identical with Socrates" somehow involves Socrates, the essence itself does not have to be as real as Socrates. More straightforwardly, "although all entities have essences, essences themselves should never be thought of as further entities"[148] (Lowe 2008, p. 23). The essence of the property being identical with Socrates does not entail the existence of a real Socrates.[149] Similar moves can be seen in many other philosophical debates (see section 4.3 below).

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[146] Famously, Wittgenstein (e.g. 1961, 5.5301 & 5.533) makes this point (see also Muehlmann 1969). More recent examples can be found in the work of identity deflationalists. Even if identity is redundant, it does not follow that haecceities are also redundant. In fact, believing in haecceities can be viewed as a good way to replace identity, which is good news for identity deflationalists. As Max Rosenkrantz (2009, p. 183) argues, according to Wittgenstein, "anything that can be expressed by means of the identity sign can be expressed without it. The identity sign is therefore eliminable", and *individuation*- not identity—is what at issue". See also Ramsey (1931), Carnap (1937), Jaakko and Hintikka (1956) and Landini (2007).

[147] A similar worry has been raised against actualists (e.g. Plantinga 1974) who posit uninstantiated individual essences (see Loux 1978 and Moreland 2000). But our haecceity theory is quite different from Plantinga's individual essences, because we use mereology to analyse instantiation.

[148] This also suggests why the notion "individual *essences*" might not be equal to haecceities. If we apply Lowe's point not only to properties, but also individuals. Then saying an individual's essence cannot be an entity does not follow that a haecceity is not an entity.

[149] There might still be a worry in the neighbourhood, namely that the instantiating of the property presupposes the thing that instantiated it. But it is not clear that this is really a problem. As we will see in chapter 7, we analyse instantiation in terms of parthood. A substance is the sum of some properties (with a primitive haecceitification relation among them). By explaining the whole in terms of its parts, we simply analyse the whole as a collection of its parts. There is at most a very weak circularity, namely that to "call" something a part assumes it is a part of some whole, but the part itself has nothing to do with the whole (and other parts of it). Likewise, as we will argue below, Socrates's haecceity is called "Socrates's haecceity" when some haecceity has formed a substance with certain qualities. There is nothing within the haecceity itself that it needs to assume the existence of these qualities. In short, it seems that the possible instantiating version of the circularity worry is not metaphysical.

To sum up, the property being identical with X can enter into a relation, but is not constituted by any relation or by X itself.

3.   The tracking problem

Finally, we consider another variant of the circularity worry, the "tracking problem" raised by Williamson, and see how we could reply to it. The "tracking problem", according to Williamson, is this:

> Informally write X tracks *y* for X is a haecceity of *y* and X cannot be a haecceity of anything other than *y*, […] given the background logic, my haecceity necessarily tracks me. Even if I had never been, by Compm (the comprehension principle) there would still have been a property tracking me (and only me). But how can it lock onto me in my absence? In those circumstances, what makes me rather than something else its target? (2013, p. 269)

Note that Williamson raises this problem especially for "contingentists" (or in the misleading term which Williamson rejects, *actualists*), because for him, there is no contingency in what individuals or haecceities there are. If everything is necessarily something, then it is not right to suppose the *possible absence* of some actual entity in the first place. After various arguments we cannot explain here, his conclusion is that, unless his necessitism is accepted, contingentists cannot easily solve the tracking problem.

We have no objection to Williamson's idea that how many individuals and haecceities there are is necessary. If that is the case, it becomes much easier for us to understand the mechanism of haecceities. There is no need to talk about the "pseudo"-possibility at all. But our diagnosis here is that the problem is not pressing for either necessitism and contingentism, if the distinction between how we represent the world and the world itself is fully appreciated. There is no "me" or "Socrates" out there waiting to be individuated. I get my identity simultaneously when I am individuated. The problem "*how* haecceity of me can be mine, rather than someone else's?" is as misleading as the problem "how the redness *of this* apple can be its redness, rather than something else's?"[150] Let us explain in more detail.

Consider an apple Mary: if it is a substance at all, then according to the detailed ontology we will later develop, Mary is a special mereological sum of its haecceity, which is Maryness, and other qualities like being red, being juicy, and being spherical. Even if the proper name "Mary" is not available, there is still a sum which has a special ontological status which the sum between the haecceity and other qualities does not have. Now, somebody asks:

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[150] For interested readers, Carmichael (2015) does have an answer to the question, for instance, why Socrates's colour is his and not others: he argues that is because there is a compresence relation between Socrates's colour and his haecceity. Then he continues by arguing that the fact that Socrates' haecceity is his haecceity is grounded in the fact his haecceity compresents with his haecceity. Whether this is an acceptable answer depends on how we understand the fundamentality relationship between compresence and having haecceity.

Q1   How is it possible that Maryness can be a haecceity of Mary if Mary does not exist?

Well, for Williamson, Mary necessarily exists, but it is not clear how he would understand the relationship between a property and its substance. If "Mary" refers to the sum of one haecceity and some qualities, then it seems that in worlds where these qualities or haecceities are not abundant enough, Mary would not exist there. But the haecceity which is called "Mary's haecceity" in other possible worlds with red apples, can still exist in worlds where there are no apples at all. But even in those worlds where there are no apples at all, the nature of *that* haecceity would be the same because its nature allows it to mereologically form a substance *if relevant qualities exist*. As we will see later, the haecceity *itself* provides the origin of hacceitification. It *makes* the substance, rather than being instantiated by something already there in the traditional sense. When the relevant qualities are not enough, we naturally have uninstantiated haecceities. (This may lead us to some extent to Platonism, but there are benefits of this: for instance, uninstantiated haecceities could be used to ground the possibility of alien individuals. Other modal theorists like Armstrong struggle to accommodate this.)

In other words, the tracking problem will only be a problem once we take the relationship between a substance and its haecceity to be somehow external, that is to say, only when we assume Mary's existence and its haecceity are not intimately connected. This will be clear if we compare Q1 with a similar but different question:

Q2   Is it possible that Maryness can haecceitify redness if redness does not exist?

Q2 is an intelligible question and the answer is simply no, a haecceity cannot form a substance if one quality does not exist, because haecceitification requires both a haecceity and its matching qualities. If one of them is missing, the correspondent substance cannot exist, which means all the qualities of Mary are necessary for her existence. We will come back to this in Chapter 9. This makes perfect sense because haecceities and qualities are ontologically on a par: they are all properties, and the existence or non-existence of one does not entail the existence or non-existence of the other. To the contrary, under our ontology, question Q1 above is a bad question because the substance called "Mary" is simply the *result* of haecceitification. The existence of Mary and the existence of its haecceity are *not independent*. If we take Mary to be something fundamental and its haecceity derivative, Q1 might be a good question. But unfortunately, it makes no sense in our ontology where substances could be understood in terms of haecceities and qualities. It seems what Williamson has in mind is a model where Mary is a basic unit and can be a subject of modification in various possible worlds; by contrast, in our ontological model, Mary is analysable in terms of further constituents where haecceities and qualities are the basic units.

At any rate, a clear ontology of haecceities is needed and this is what is developed in the next few chapters. But for now it suffices to say that the tracking problem is not very pressing. To repeat, the haecceity of Mary, H, *becomes* Mary, and is named as "the haecceity of *Mary*", only when all

other qualities required for haecceitification are all there. (As we will see, we take haecceitification to be necessary when both haecceities and the relevant qualities are abundant.)

4. Diagnosis

Two reasons might explain why philosophers like Markosian and Williamson may have the misleading intuition that the haecceity of Socrates must presuppose the existence of Socrates.

Linguistic concern

The first reason is linguistic. "The haecceity of Socrates" is just the way we express the identity of a haecceity in language. The name is part of the expression, but that does not mean Socrates is an ontological part of his haecceity. As Lowe says,

> We should not uncritically assume that this predicate ("is identical with A") captures the intrinsic nature of the property. […] There may in principle be a predicate which expresses the property of being identical with A which makes no reference to A. It may perhaps be that **there is no humanly learnable language**[151] which contains such a predicate, but that would only imply something about our cognitive limitations, not anything about the property itself. (2003, pp. 87–88)

Can we find an alternative predicate to express a haecceity? Here Lowe seems pessimistic. One such candidate might be: the property of being identical with whatever necessarily instantiates it. The predicate does not need to reflect information about its later "owners", and as Adams himself writes it might the case that there are many haecceities like each other. Another candidate to define haecceities without names, which is due to Adams himself, is to say *a haecceity is a property of having itself as a haecceity* (see more in next section).

Again, there is no worry about giving a specific name to each haecceity to distinguish them. As Scotus puts it, they are "primarily diverse". And trying to distinguish haecceities by other properties is to make a category mistake: only a substance may be distinguished by properties; by contrast, haecceities, as individuating properties themselves, are by nature not the kind of entities of which a question like that can be asked.

The plurality of haecceities is *collective* instead of distributive: it is like the plurality of particles we observe in physics: statistically and globally speaking, we can infer that there is a plurality of fermions, but we cannot name them in a differentiable way. Here we only say that *we* cannot know which is which epistemically; we will be neutral about whether there is any metaphysical matter of fact as to which is which or not. But at any rate, as Lowe's remark shows, once the linguistic intuition is distinguished from the reality itself, the objection from circularity greatly loses its force.

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[151] Interestingly, Heidegger also suggests that a haecceity of a substance is "an inexpressible residue left remaining" when the substance is only grasped via species-concepts (1916, p. 253).

Epistemic concern

Relatedly, the second reason which causes confusion in the circularity objection is epistemic. In practice of gaining knowledge, it seems that our concept of Socrates comes before his haecceity. And most people who know Socrates may have never heard the term "haecceity" at all. But why does the order of knowing have anything to do with the order of reality?

Let us consider two more cases to demonstrate the point. Firstly, if Kripke (1980) is right, then H_2O is the essence of water, even if historically the knowledge about H_2O came much later than that of water. Secondly, consider the bundle theorists who hold properties are more fundamental than substances: the fact that people know who Socrates is but have never heard of the notion of, say, universals, should not be a problem for those bundle theorists.

Therefore, in a situation where Socrates exists, we already *know* him and then we conveniently *call* the haecceity which combines certain properties (like being a philosopher and being the teacher of Plato) "the haecceity of Socrates". In another situation where he had never existed, surely, we will not be able to name that particular haecceity "the haecceity of Socrates". But still, it is true to say that the thing we cannot name in that situation would have been the haecceity of Socrates if he were to exist there. When God decides to create Socrates from the general properties he has on the table, according to the ontology with haecceities and properties, he needs to create one haecceity. And then Socrates is the product of the combination of that haecceity and the certain properties we usually associate with him. As we will see in next chapter, we take a substance to be a special mereological fusion of a haecceity and some universal qualities.

Other related topics in philosophy

Even if we do take some linguistic phenomena or intuitions as the starting point for our study, and even if haecceity has to be expressed in particular ways like "being identical with X", it is not clear that we must believe there is something ontological corresponding to the expression. It is not completely new for philosophers of language to distinguish reference from referent: it makes perfect sense to talk about reference without referents (Sainsbury 2005). Also, in the discussion of powers, it seems that to fully understand what a power is, its actual or possible manifestation must also be present. But again, as Lowe (2008) points out, that only shows that a manifestation constitutes the essence of a power, but does not entail that the power's essence must exist like a real entity. Further, in the case of intentionality, we can think *about* or talk *about* non-existent things. It would be too dogmatic to assume that whenever we talk about or think about something with a referential apparatus (if we do need one, although as Lowe says we may not), there must be something "out there" to fulfil the role of the referent (Crane 2013). A haecceity is similar to a kind of aboutness: once the assumption that *a haecceity about X must presuppose X's existence* is given up, the circularity worry loses its appeal. We are not arguing that those theories of reference and intentionality must be correct:

the point is simply to note that there are debates in other areas of philosophy which cast enough doubt on the assumption.

The above discussion should be enough to justify the coherence of the view that the haecceities of some individuals do not need to have those individuals exist prior to them. No question of *how* two haecceities can lock onto two different things can legitimately be asked. Nor is there any problem of how my haecceity can successfully be my haecceity, rather than someone else's: it is only after God assigns my haecceity to certain qualitative properties that I have the ability to use the self-referential term "me" to describe the situation.

5. Circularity can be informative

What we have argued so far has been directed at explaining away the putative circularity between the haecceities and the individuals they individuate. But still, some would complain that the notion of haecceities is useless. Understood charitably, the complaint is that even if, as we argued above, epistemic issues should be distinguished from metaphysical ones, it still seems that we must grasp haecceities after grasping the individuals involved. If someone claims that the only property she knows about X is that X is self-identical, many people would be inclined pre-theoretically to say she knows nothing about X at all.[152] So, it might be said that haecceities are nevertheless *uninformative*.[153]

But this depends on what kind of "information" we need. Formal logic or mathematics is also said to be uninformative, but that is by no means an objection.[154] Admittedly, metaphysical explanation is quite different from physical explanation. Only the latter gives enough of the "empirical information" which ordinary life looks for. Consider the fact expressed by "a rose is red": what could be the *right* explanation or answer to the question "*why is the rose red?*"? A physical explanation might be based on light and wavelength; a biological explanation might use genetic theory. But for metaphysicians, some would analyse it in terms of instantiation: the rose is red because of the instantiation of redness, or even further analyse the instantiation in terms of constitution. It is not clear why some explanation should be better than others if they reveal different aspects of the same fact (at least when it is coarse-grained). If someone has no interest in instantiation, it is understandable that she might find the metaphysical explanation of redness useless and uninformative, but this is because she is not looking for a metaphysical information at all.

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[152] This is inspired by a talk given by Gabriel Markus in Durham Castle in 2015.

[153] Note that this worry is slightly different from the worry we talked about above. Williamson's tracking problem mainly concerns the metaphysical priority of individuation, while the worry we are going to address in this section is about a circularity in definition or conception.

[154] In fact, haecceities are not completely empirically empty, because intuitions or experiences of haecceities have been repeatedly reported in history. The English poet G. M. Hopkins uses the term "escape" to denote his special feeling of haecceities. One observation here is the grasp of self: the way we grasp ourselves or our self-awareness seems to be different from the way we perceive external entities.

The case of individuation is the same. Linguists explain "a chair is the chair it is" by appealing to the convention of naming; but engineers may analyse the fact that a chair is the chair it is by noting its special function. Only metaphysicians would explain the fact by saying the chair is the chair it is in virtue of having a haecceity of the chair (if the chair is treated like a substance). If someone finds the claim that "X is X is in virtue of instantiating the property of being identical with X" uninformative, she might find many metaphysical explanations uninformative as well. This problem is not unique for haecceity. Since the whole discussion assumes the legitimacy of general metaphysics, if we think systematically, no special objection could be raised here. In fact, that a haecceity is a *property* has already made the analysis non-trivial because individuality is analysed via a distinct ontological category, namely property. To repeat, if it is not the empirical information that we are looking for, then even if somehow there is still some kind of circularity lurking, it does not follow that the circularity is uninformative. Using Yablo's remark on circular definition,

> If the definiendum is part of the definiens, then the definiens cannot be fully grasped until the definiendum is fully grasped. But it is a further claim that this renders the definiens useless in an explanation of the definiendum's meaning. (1993, p. 149)

For instance, consider the following definition of a haecceity,

H is a haecceity of $x \leftrightarrow_{df} x$=me $\vee$ (x is not me & H is not a haecceity of x)

Such a definition of H is clearly circular, but it still tells us that the only applicable extension of H is me. (Again, note this kind of circularity about *definition* is not the circularity of *individuation* which violates the Principle of Priority. Hence the circular definition still obeys that principle of evaluation.) Anything other than me cannot be said to have H. (A general definition of a haecceity without referential terms, as mentioned above, would be something like this: x has H $\leftrightarrow_{df} x$ has the property of having H.)

In other words, in saying (P) "Socrates is Socrates because Socrates has the property of being identical with Socrates", we can get rich information because (P) itself partly provides the meaning of Socrates and how Socrates himself gets individuated. And from (P) we at least know that Socrates has a structure with property. In using "Socrates" and "the property of being identical with Socrates" to formulate a grammatical sentence, we have implicitly grasped the meaning of the haecceity of Socrates. It is incorrect to say we understand meanings of sentences only from each part and then go to the whole via a process of "building up", or that we have to understand the meaning of the above sentence after we first understand the meaning of "Socrates" in isolation. In fact, we may say that such a definition tells us a *rule governing its use*.

As Yablo (1993, p. 151) points out, to understand a circular definition is like solving an equation. We must think of the equation as a whole to get the solution. The idea is common in mathematics. Functions like F(x)=2F(x), or F(x)=F(F(x)), are all silent in their inner structure, but nevertheless they can be informative. For instance, from F(x)=2F(x), we know that no matter what

value x is assigned, F(x) will always be 0 (From F(x)=2F(x) we can infer that F(x)-F(x)=2F(x)-F(x), then it follows that 0=F(x)); from F(x)=F(F(x)), we know one important property of F, namely, its self referentiality. Cases of this kind are not limited to mathematics and haecceities. In the discussion of powers, powers are often individuated holistically, and one way to avoid the vicious circularity of individuating powers is to use Ramsey sentences. In understanding the sentence, a rule of use will be learnt (Lewis 1970, Whittle 2009).

Now let us go back to the original problem about circularity. The foregoing discussion should be enough to show that circular definitions can be informative. So, even if nothing specific is assertible under the circular definition of haecceity, it still provides useful guidance in understanding the notion.

6. Conclusion

In the previous two parts of this chapter, we began by outlining key features of haecceities and our intended ontology. And then we argued that an appeal to haecceities is sufficient and necessary for the distinction of the spheres, and faces no categorical circularity nor the pairing problem. They are also desirable because they can deal with all cases of distinction in a uniform way.

Then we considered the idea of haecceities without individuals. Various circularity issues about haecceities were discussed. We argued that it makes sense to have haecceities before the existence of their individuals, and we also analysed the reasons behind the various confusions by distinguishing metaphysical problems from epistemic and linguistic ones. Finally, we argued that even if there is a genuine circularity in definition, it can still be informative in some interesting sense.

Chapter 6
Haecceities and the Problems of Distinction (C): Indivisibility and Dependence

In the first two main parts of this chapter, we argued that the haecceity solution is sufficient and necessary in explaining the distinction of the two spheres. Also, it does not face the various circularity problems and can deal with the general cases of distinction. This section shows further benefits of the appeal to haecceities. We will argue that the solution also obeys two other important principles of evaluation. Section 1 is about the Principle of Indivisibility, and shows that the haecceity solution can solve the Problem of Indivisibility; Section 2 shows that the solution also obeys the Principle of Ontological Priority; Section 3 concludes. Our aim here is not to provide all the details of the solution; rather, we are preparing the ground for further discussions which are to come in the next few chapters. Here we only try to give a general idea of how the haecceity solution obeys[155] *all* the principles of evaluation which we set up.

1.   Indivisibility

1.1   Why indivisibility?

We said in the Introduction that for Scotus the Problem of Individuation has two related parts: one is the Problem of Distinction, and the other is (the) Problem of Indivisibility. One principle of evaluation says that a solution to the Problem of Distinction should also be able to solve the Problem of Indivisibility, or at least would be better than other solutions which cannot. Let us firstly recall the problem. In Scotus' words,

> The sense of the questions on this topic [viz. of individuation] is: What is it in [e.g.] this stone, by which as by a proximate foundation it is absolutely incompatible with the stone for it to be divided into several parts each of which is this stone, the kind of division that is proper to a universal whole as divided into its subjective parts? (Ordinatio II, d. 3, p. 1. q. 2, n. 48 (Scotus [OO], 7:412-413; Spade (1994), p. 69))

By "division", what Scotus has in mind is something like "instantiability", because medieval thinkers often take universals to be "common natures"[156] which can participate in many instances, and that kind of participation metaphorically means the common nature must somehow divide itself into different instances. But clearly, Scotus points out some differences between a universal and a

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[155] As we noted in Chapter 3, those principles of evaluation are not mutually exclusive, and thus although there are a few principles which due to word limitations we cannot discuss in full, it can be easily seen from the other principles that they are met. By contrast, all principles addressed in this chapter have been violated by other non-haecceity solutions.

[156] Not every scholar would agree with the identification of common natures and universals. But since our primary concern is not historical, we will only use Scotus as a beginning point and follow the mainstream understanding.

substance which needs explanation.[157] In our context, there are two differences worth noting. The first is something which the substance has and its universal does not, namely, a certain kind of *unity*.[158] Here we call it the Many-over-One Problem (Rodriguez-Pereyra 2000): how can many properties (universals) be *unified* into one substance? By contrast, the second is something which a universal has and its substance does not, namely, a certain kind of *instantiability*. There is an asymmetry between substances and universals: why can universals be *instantiated* while substances cannot?

As explained before, one clear case where the Problem of Indivisibility and the Problem of Distinction should be separated is when we only have *only one substance* in question. Then, there are no other substances in existence from which that substance is distinct, but its unity and non-instantiability still require explanation. Distinction for substances assumes there at least two of them and can only be seen holistically, while the unity and non-instantiability of a substance do not require the existence of other entities and can be thought of merely individually.[159]

Finally, note that the distinction of these two problems does not mean that they must have essentially distinct solutions. As we will see, theories of haecceities may solve both problems well.

We take the unity and non-instantiability of substances to be the two main things that require explanation.[160] Most solutions we have explored fail to offer these explanations. For example, as seen in chapter 4(A), it seems there is nothing within the spacetime solution itself that can provide the unity of substances. At least, the unity still awaits explanation if spacetime is a substance. After all, spacetime is a scientific and empirical concept which needs to be analysed in terms of ontological categories. Also, the solution with tropes can at most be used to differentiate substances (albeit only to a certain level, as shown in Chapter 4(B)), but the unity of tropes and their substances cannot be further analysed by other tropes.[161] By contrast, as we will see, the haecceity solution can solve the Problem of Indivisibility nicely.

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[157] In fact, the idea of separating the two problems can not only be found in Scotus, but also in some contemporary philosophers. In a 1953 Aristotelian Society symposium on individuation, Popper pointed out that the other two speakers, Anscombe and Łukasiewicz, were talking about different problems of individuation: Anscombe addressed distinction while Łukasiewicz was talking about unity.

[158] There are similar problems in other metaphysical debates. For instance, Armstrongian states of affairs need to explain what unifies a universal and a particular (see Dodd 1999 and Tugby 2016).

[159] This corresponds to what medieval thinkers such as Hendry of Ghent called the "two negations of individuation": one is "*from outside*" and the other is "*from inside*" (see Pickave 2010, Pini 2015). The problem of distinction considers the case holistically and the problem of indivisibility considers the case individually.

[160] It is not clear whether Scotus also means what we mean today by indivisibility. Substances are *literally* indivisible because they cannot be divided into parts which are not themselves substances. In other words, as we argued in section (A) of this chapter, a substance does not have any substantial parts (Heil 2012). But *literal* indivisibility is something we need to argue for, rather than a datum which requires explanation. So we will only consider two dimensions of the notion "indivisibility".

[161] The point also applies clearly to a recent position on the problem which we cannot cover in detail, namely, structuralism. A structure (for instance, a weakly discernible relation for x and y such that Rxy but not Rxx) at most explains distinction but cannot explain unity because there will be no real relation at all for only one substance.

1.2   Many-over-one

A substance that has not been individuated is not part of reality. According to the theory being proposed in this thesis, it is the existence of haecceities which explains why properties do not randomly float in the air: otherwise the world would explode with outlandish entities which are liberally composed by different properties: the colour of my hair, the shape of the moon, and the charge of an electron, could compose something which would be as real as ordinary objects like tables and rocks. The sum of these properties may well exist, but they are hardly a unified entity which can do interesting explanatory work.[162] This shows why we might need something to do the unification work to prevent the properties from being scattered everywhere.

It may be helpful here to briefly compare the haecceity solution with another failed solution to the Problem of Distinction that we have not explored, but which was influential in history: the solution with *matter* or stuff. According to a certain reading of Aristotle and Aquinas, two distinct entities of the same genus are distinct because they do not have the same matter, or, more accurately, *extended (chunks of) matter*.[163] But Scotus (1639) rejects this solution mainly because it deals only with the Problem of Distinction, rather than the Problem of Indivisibility or specifically of *unity*. Roughly, one of his arguments is that the chunk of matter can be the same even if there is a substantial change. Hence matter alone is *insufficient* for the unity of a substance across different times (Cross 2014). The other argument is that the distinction between matter and universals itself also needs explanation. We need to explain why, for instance, chunks of matter cannot be divided into pieces that are also the same chunk, while the universals can be instantiated into instances that can be predicated by the same universals (Chisholm 1975, p. 38).

A clearer reason for thinking matter itself is unable to explain indivisibility can be seen if we recall Lowe's (1998) distinction between individuality and identity. To repeat, he holds that some entities only have determinate identity, but not individualities (countability). One representative case for entities which only have determinate identity without countability is infinitely divisible matter.[164] That is to say, it makes sense to say "water is not gold", but it does not make sense to say gold itself is one unified and countable entity. Unity cannot be explained by matter or stuff. In fact, on some Aristotelian models of substances, matter needs to be informed by substantial universals and then compose a substance. Neither the matter nor the substantial universal can play the role of unifying things, at least for substances of all kinds. Instead, the role they can play is what Diekemper (2009, p.

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[162] In Chapter 2, we pointed out that it might not be the case that being green is more *natural* than being grue. But it does not follow that there cannot be a unique and correct way to classify the entities in the world. To the contrary, one job the notion of "unity" can do is to explain why some entities can have special roles in explanation.

[163] The modification with "extended" implicitly tries to use spacetime to help, but as we have shown in Chapter 4(A), the spacetime points solution fails. Our idea here is a more general one: matter lacks unity.

[164] Lowe (1999, p. 99) does not commit to the actual existence of such matter, but the point is that the idea is coherent.

4) calls the *principle of organization*, in contrast with the principle of individuation. Haecceities cannot be replaced by matter or other substantial universals.

By contrast, it is not hard to see why we need haecceities, because the haecceity solution avoids many problems for the matter solution. Haecceities are supposed to be a principle of individuation, rather than organization; to understand them is to understand their theoretical roles. According to our ontology, haecceities carry the information a particular substance needs. It can select certain universals and combine them into a complete substance. As will be shown in Chapter 7, a substance is the mereological sum of haecceity and its *correspondent* universals. We call such a unique correspondent relation between a haecceity and one of its universals *haecceitification*. There may well be a mereological sum of my hair's colour and London's size, but it is hardly an interesting substance because what is added in a substantial sum is its haecceity.[165] Also, there may well be a mereological sum of my haecceity and London's size, but due to a lack of the haecceitification relation between my haecceity and London's size, the sum is not a (part) of substance. Haecceity provides the origin of unity of substances.

One advantage in using haecceity as the individuator is that it faces no problem of vicious regress because if matter is the individuator, for instance, in the model developed by Loux (2006), we not only need a hierarchy of matter in different levels, but also to appeal to spacetime to explain the individuation of matter at the fundamental level. For haecceities, however, after using it to unite other properties, we do not need to ask what makes the very haecceity itself united with the properties. This is partly because the haecceitification is necessary. We will say more on the regress problem in Chapter 9.

1.3   Non-instantiability

We have roughly sketched how haecceities are responsible for unity. Now let us turn to the non-instantiability. It seems that being instantiable or not can be a *categorical verdict* on substances and properties. It might even be claimed that the categorical distinction between a substance and a property is defined as two relata of the anti-symmetrical relation: instantiation. If x instantiates y, then we can infer from this ontological structure alone the conclusion that x is a substance and y is a property.

Again, in our ontology, a substance is a mereological sum of a unique haecceity and its correspondent universals. Then it would be convenient to discern *three* relationships among them. All may be called "instantiation". The first one is the relationship between a universal and a haecceity; the second is between a universal and its substance; and the third is between a haecceity and its substance. The latter two relationships, as we will see in Chapter 7, are clearly defined as *mereological*. The universals and the haecceity are all parts of the whole substance. The interesting bit is the special

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[165] As will be shown in Chapter 8, this is not infallible.

relationship between a haecceity and a universal, which we call "*haecceitification*". A haecceity is like an unsaturated entity with many places to be taken by universals.[166]

Under this picture, if by instantiation we mean haecceitification, then the reason why a universal is instantiable and a substance is not is very simple: only a universal can be haecceitified, and a substance cannot because it is the resultant entity of haecceitification. Only universals are subject to haecceitification and the substances are not. Further details about how haecceitification works will be given by the system of haecceity mereology in Chapter 7.

On the other hand, if by instantiation we mean mereological relation, then things are even clearer. The reason that only a universal can be instantiated while the substance cannot is simply due to the fact that only the universal is a part of the whole substance, and in contrast the substance is not part of the universal.[167]

In this section we analysed different problems associated with the Problem of Indivisibility, and argued that haecceities can help to solve these problems nicely, or at least much better than other entities can. This means that the haecceity solution meets one more of the requirements we set out in Chapter 3. Now we move on to the final principle of evaluation, the Principle of Ontological Priority.

2.   Ontological dependence

We begin this section by explaining in what sense we hold haecceities to be more fundamental than substances, but then argue that their fundamentality is neither strongly reductive nor in violation of the independence of substances. We also hold that the dependence relation between a haecceity and its substance should be rigid.

2.1   Haecceity solution obeys the Priority Principle

According to one of our principles of evaluation, a good solution needs to get the ontological priority right: If fact A is used to explain distinction fact B, B cannot be more fundamental than A in the proper sense. Most solutions previously discussed do not meet this requirement. For instance, in Chapter 4(A) we argued that the spacetime solution does not go well with some relationalist views according to which the spacetime points depend on their existence on the objects (substances), and not vice versa; in Chapter 4(B), we see that the trope solution faces a dilemma: if tropes are not dependent

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[166] Note that a haecceity's being unsaturated does not mean it is not *simple* in itself. The "saturated entity" would be the whole substance. See the next chapter.

[167] Bowers and Wallace (2018) argue that there is a "*haecceitic Euthyphro dilemma*": "did the amoeba split in two because two haecceities came to be instantiated, or did two haecceities come to be instantiated because the amoeba split in two?" (p. 17). They argue that the second horn makes haecceities less-fundamental and the first horn is obscure because it is mysterious for them how physical distinction can be explained by abstract entities' instantiation. But this strikes us as a bad worry because that only shows we need a good theory of instantiation. (In fact, the so-called "dilemma" is about universal-instantiation in general, not for haecceities in particular.) Once the points here (and Section 2 below) are fully appreciated, the problem disappears with a clear notion of instantiation and dependence. See also Skiles (*forthcoming*) for a forceful reply.

on objects, then the solution faces the previously mentioned objection from the possibility of extended simples, which makes the existence of two distinct tropes insufficient for their bearer's (or bearers') distinction; but if the solution tries to avoid the problem by saying the tropes are dependent on objects, then it breaks the current principle.

By contrast, it is not the case that the individuated substances are more fundamental than haecceities. If they were, then it would be impossible to have a haecceity before the existence of the substance; but, as we argued in Part 6 (B) of this chapter, the notion of a haecceity without taking the individual substance as constituent of it, makes perfect sense. As far as the Principle of Ontological Priority is concerned, the haecceity solution is a good one.

2.   What kind of priority?

As mentioned in the last main section, some haecceity theorists are Platonic. Rosenkrantz (1993), an early supporter of haecceities in contemporary metaphysics, clearly embraces Platonism, and more recently Carmichael (2015) also calls his own haecceity position *Deep Platonism*.[168] Since we also accept the possibility of non-haecceitifying haecceities (see Chapter 9), our view can also be called Platonic in the sense that haecceities can independently exist in some possible situations. Naturally, this sounds like haecceities can be seen as more *metaphysically fundamental* than substances. Consequently, if merely possible individuals are allowed, then it is possible to have *more* haecceities than the actual individuals, this seems to make substance less fundamental than the haecceities because haecceities always exist while some substances do not.[169]

Weak reduction

Is our view a "*reductive*" account of substances? This depends on what we mean by reduction. Clearly, we do *not eliminate* substances. We cannot reduce anything that does not exist at all. As Diekemper says about Loux's Aristotelian model of substances, in which substances are combinations of matter and a substantial form,

> The Aristotelian model I have sketched here is, as far as contemporary constituent ontologies go,
> minimally reductionist. It is only reductive in a very weak sense, since the reduction of substance to a
> composite of matter and substantial universal does not involve the reduction of its **kind-determining**
> universal to more basic universals. […] This picture provides a welcome balance between the relational
> ontology on the one hand, which fails to fully explain substances and the role of universals in an

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[168] Note that it is not impossible to hold that only haecceities are more fundamental than substances and most other properties are not. We will avoid this complexity.

[169] Our intuition here about the haecceities' dependence on the substance is based on the *existence* of uninstantiated haecceities in some possible situations, but it might be argued that even if a haecceity and its substance *necessarily coexist* in all possible situations, a haecceity is still more fundamental than the substance (cf. Fine's (1994) case of the singleton). But that only shows we *do not have to* argue for the fundamentality of haecceity via the existence of some possible non-haecceitifying haecceities, to wit, theories which do not believe in non-haecceitifying haecceities *can still be "Platonic" in the proper sense*. But at any rate, our overarching conclusion that haecceities are more fundamental would still be the same.

ontology of substance, and other constituent ontologies on the other hand, which reduce substances to something other than the familiar concrete objects of our experience. (2013, p. 7)

We are not saying this model is problem-free. The point is that analysing substance with further elements does not deny the status of substances. In a similar fashion, we could say, by analysing substances as the special sum of a haecceity and qualitative properties, substances are reduced "minimally". A substance, S, is still independent in that it does not depend on its own existence and identity on the substances. If other substances cease to exist, this will not affect the existence of S. But haecceities are still more fundamental than substances in a weak sense: a haecceity is like Diekemper's kind-determining universal because it carries information about all the universals a substance requires. The existence of nonhaecceitifying haecceities may justify haecceities' fundamentality, but when both a haecceity and its substance are present within a world, the question of which is more fundamental seems to be more to do with *explanation*, rather than what exists.

Independence-within-a-kind

Relatedly, there might be a worry for our theory which could be replied to: in various places (e.g. Part 6 (A) of this chapter and Chapter 7), we hold that substances are *independent*. But if they are sums of haecceities and universals, does that not mean substances are not independent, since it seems they are dependent upon their elements, namely, haecceities and universals?

Our reply to this is that we need to distinguish various senses in which substances are independent. In our discussions in other places in this thesis, the notion of independence is used to clarify why a substance cannot have further parts which *are also substances*. It does *not* follow that a substance cannot be mereologically composed by other parts (see below). Here we may distinguish at least two kinds of independence. One is a weaker independence within a given category, and the other is a stronger independence which does not entail the non-existence of *any other entities* in other categories whatsoever. For instance, in discussing various notions of independence in Hoffman and Rosenkrantz's (1997) theory of substances, Merricks suggests the following definition,

An entity is independent-within-its-kind if the existence of that entity does not entail that there are other instances of the category to which that entity (and its proper parts) belongs. (1997, p. 481)

For example, when I say I am independent, I am comparing myself with other persons instead of my cells or organs. I (if I am just my body) do depend on them in an intuitive sense, but that does not violate my independence-within-a-kind! Likewise, in the case of substance, in order to argue that a substance cannot have other substantial parts, we do not have to deny that substances have parts or constituents themselves. The above definition of independence is effective enough to generate the result we want: the reason why a substance cannot have further parts which are also substances is precisely that, if it does, its existence would entail the existence of other substances.

Hence our position is coherent: that substances are independent *from other substances* is compatible with the idea that they still have some mereological complexity. Being independent within a category does not mean having no constituents, and it does not mean we cannot analyse or say something informative about it. A substance can be said to be unified, and what haecceity theory does is partly to *analyse* what such a unity amounts to: to say something is a substance *just means* to attribute a haecceity to it. The fundamentality of haecceities well matches the aforementioned idea that haecceities are the hallmarks of substances (cf. Paul 2013).

Rigid dependence

Finally, it should also be acknowledged that the kind of dependence involved in our intended ontology is *rigid*. Roughly speaking:

> *x* depends rigidly for its existence upon *y* =$_{df}$ necessarily, *x* exists only if *y* exists (Tahko and Lowe 2016)

Suppose Socrates had never existed, but could have existed if the certain properties were formed properly in some condition with one haecceity, H. Then we may say Socrates' existence depends on H, but note that according to what we said above, there are many other spare haecceities: can *any of these* serve the purpose of being the haecceity of Socrates? Our ontology does *not* allow this, because each haecceity is unique in carrying the information about the universals required to make the substance, and if the haecceity is going to make a substance, it would necessarily haecceitify the universals Socrates has. Socrates depends on his haecceity rigidly. We will say more about this in Chapter 9 where we hold that Socrates necessarily has his universals.

But if, on the other hand, haecceities are not the way we think of them, and they do *not* accurately carry the relevant information, then even God would not be able to tell which haecceity is which, and this would mean that the kind of dependence that holds between Socrates and his possible haecceity will *not* be rigid; rather, we should say in *that* model, their dependence relationship will be *generic*, where

> *x* depends generically for its existence upon F =$_{df}$ necessarily, *x* exists only if *some* F exists (Tahko and Lowe 2016)

There must be *some* haecceity for Socrates' existence to depend upon, but not a specific one. However, there is a reason for not accepting this, because it would leave us deeply puzzled: if these haecceities themselves have no information about which universals to haecceitify, then how could it be possible at all that one of these spare haecceities, *rather than others*, is the haecceity of Socrates? There ought to be one haecceity for him, but *which* one? Granted, as we argued, we do not need to address the problem of which is which if we are only concerned with the Problem of Distinction; yet once we look further down into the detailed ontology, the view that haecceities themselves do not carry any information would open up a great degree of arbitrariness, and makes the problem of which

is which in principle unanswerable![170] Thus, if such arbitrariness is to be avoidable at all, taking the dependence to be rigid is a better choice, and these lines of thought in turn leave our intended ontology strengthened: it is because of the nature of haecceities that the dependence is rigid.

In this section, to sum up, we have argued that haecceities are more fundamental than substances to a certain extent, but that substances can still be independent within their own category. In short, the haecceity solution obeys the priority principle we set up.[171]

3.   Conclusion

Part 6 (C) of this chapter has argued that the haecceity solution can solve (the) Problem of Indivisibility and has the right ontological priority. We clarified in what sense haecceities are more fundamental than substances, and showed that substances can still be independent.

Together with those in Parts 6 (A) and 6 (B) of this chapter, our arguments put us in a strong position to conclude that the haecceity solution is the best solution to the Problem of Individuation, because it meets almost all the requirements[172] we set out in the principles of evaluations. Meanwhile, we also discovered interesting features of the notion. In the next chapters, we take get a closer look at our intended ontology of haecceities.

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[170] Of course, this does not automatically mean the problem of which is which will definitely be answerable if the dependence is rigid.

[171] There seem to be many other unexplored possibilities about the dependence relations between the haecceities and substances if we allow other factors like space and time in our picture. One case is Ingram (2016), who claims that haecceities can persist and that haecceities are dependent upon on the substances *only for a short time*. We cannot evaluate this here, but one big worry is that talking about the persistence of haecceities is a category mistake. For example, if being spatiotemporal itself is a property, then it needs to be haecceitified. Haecceities are not like ordinary objects which can exist in spacetime.

[172] As mentioned in footnote 155, we did not discuss the Non-revenge Principle and the Principle of Reliability, but it is not hard to see the haecceity solution also obeys them: Firstly, if haecceities are more fundamental and from a distinct category from substances, then the *same form* of the PoD will not reoccur for haecceities. Although haecceities may also be primitively distinct, they are structureless and can do explanatory works. By contrast, spacetime points face the revenge problem (See Chapter 4A) because on one hand, as many pointed out, spacetime point can have further constituents like haecceities, and on the other hand, spacetime is an empirical notion which needs to be categorized. Secondly, by definition, the distinction between a haecceity and a substance (see also Chapter 7) is much better established than the distinction between a spacetime point and a substance, especially when supersubstantivalism is accepted.

Chapter 7
The Ontology of Haecceities (A): Haecceity Mereology

We have argued that haecceities can solve the Problem of Distinction and of Indivisibility, and hence should be accepted.[173] We also briefly proposed that substances could be understood via haecceities and universal qualities. In this picture, we get an ontology with properties at the fundamental level: all we need in making reality is those haecceities and qualities (Hence we are "one-category ontologists" in some sense but again that does not mean a denial of "substances": clearly there are spherical substances whose distinction needs explanation. The category of "substances" is still real in a derivative sense). Now, several issues should be addressed. For instance, what is the relationship between the haecceity and its qualities? Can the same haecceity combine with different possible qualities?

To begin with, this chapter analyses the relationship between haecceity and qualities in terms of *property mereology*. We propose to view a substance as the mereological sum of one unique haecceity and its "haecceitified" qualities (universals). Section one outlines the basic ideas and rules of a property mereology; Section two proposes three additional rules for that property mereology with haecceities; Section three is a conclusion which summarizes the main mereological rules that govern the performance of haecceities in our ontology.

1.   Property mereology in general

1.1   Property mereology in the literature

According to our ontology, haecceities and qualities (universals) are *all we need* for "reality making", which means the combination of a haecceity and some qualities can give us *substances*. But what does such a "combination" mean? The answer we will give is, in short, that the relationship is *mereological*, and combination just means mereological fusion.

It is not novel to hold that many things are in mereological relations, and mereology itself, as a formal system, is "perfectly understood, unproblematic, and certain" (Lewis 1991, p. 75). What *is* a bit controversial, though, is the application of this formal system to *metaphysics*. For instance, consider the various bundle theories: both the traditional bundle theory and our haecceity theory can be viewed as a one-category ontology of properties. If a substance for bundle theory is a *bundle* of qualities, then we can also say a substance is a *bundle* of a haecceity and qualities. Here it should be noted that our view is different from those who defend so-called "*non-mereological*" composition.

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[173] We explained in Chapter 3 that "primitivism" should be the last resort. That is, saying that the distinction of the two spherical substances is explained by the distinction of haecceities is much more informative than saying the two spheres are primitively distinct. Of course, the haecceities' distinction is in some sense also *primitive*, but in a more interesting sense since the notion of haecceities can be used for many other things. See Chisholm (1975, pp. 36-37) for a similar point. He argues that it is very natural to suppose that there must be something further than the substances themselves, in virtue of which two substances are two instead of one.

For instance, Armstrong (1986, 1988) argues that mereology alone cannot necessitate the truth that a *is F* because he thinks that the mereological sum of *a* and F is *not sufficient* for *a*'s being F, and then his theory needs something extra to do the unification work, which is the "non-mereological composition". But as will be explained in Chapter 9, although our theory is similar to Armstrong's ontology in some aspects, we *do not* face the unity problem and can avoid the mysteriousness of non-mereological composition, and this is because haecceities *necessarily* instantiate the relevant universals.

Historically, the bundling relation is taken to be *primitive* and has gone by various names such as "compresence" (Russell 1940, Campbell 1990), "concurrence" (Bacon 1995) and "consubstantiation" (Castañeda 1974). But other philosophers (Goodman 1951, Williams 1986) have found the primitive bundling relation mysterious and instead understand the bundling relation of properties in terms of extensional mereology. Still, not all mereological bundle theorists share the same view. But the most developed version so far (which will be assumed from now on) is given by Paul (2002, 2006). We outline the key axioms and definitions according to the system she (2006, pp. 633-634) proposed. The following mereological theory is based on her paper.

Firstly, it is widely accepted that the proper parthood relation itself is irreflexive, asymmetric and transitive. A tomato, T, cannot be a proper part of T. Hence

(A1) For any proper qualitative part *x*, *x* is not a proper qualitative part of itself. (Proper qualitative parthood is **irreflexive**.)

If T's left-half is a proper part of T, T cannot be a proper part of its left-half.

(A2) For any proper qualitative part *x* and for any *y*, if *x* is a proper qualitative part of *y*, *y* is not a proper qualitative part of *x*. (Proper qualitative parthood is **asymmetric**.)

If a seed is a proper part of T's left-half, and T's left-half is also a proper part of T, then the seed is also a proper part of T.

(A3) For any proper qualitative parts *x* and *y*, and for any *z*, if *x* is a proper qualitative part of *y* and *y* is a proper qualitative part of *z*, *x* is a proper qualitative part of z. (Proper qualitative parthood is **transitive**.)[174]

With the above three axioms, other important notions in mereology can be built up. According to the irreflexivity of proper parthood, a general parthood relation can be defined:

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[174] Of course, there are unusual cases in fiction which are alleged to violate these rules, but it is much harder to make sense of them in metaphysics. Also, there are intuitive ordinary cases where, for example, transitivity does not hold: it seems that, if I am part of Durham University, and Durham University is part of the UK, and the UK is (currently) part of the European Union, we may still feel it a bit odd to say I am part of the European Union. (After all, an EU member is supposed to be a sovereign state at least!) But membership in a political sense does not have to be the same as "qualitative parthood" in our ontological sense. The oddity of saying that I am part of the EU is not an argument against the transitivity of parthood. In the purely ontological sense, it is clear that I can be a qualitative part of the EU.

(D1) For all objects *x* and *y*, *x* is a qualitative part of *y* iff *x* is a **proper** qualitative part of *y* or *x* is **identical** to *y*. (An object's improper qualitative part is just itself.)

Then, we can define four key notions as follows:

Overlap

(D2) For any *x* and *y*, *x* qualitatively **overlaps** *y* iff *x* and *y* have a qualitative part in common.

Disjoint

(D3) For any *x* and *y*, *x* is qualitatively **disjoint** from *y* iff *x* and *y* have no qualitative part in common.

Partial overlap

(D4) For any *x* and *y*, *x* **partly qualitatively overlaps** *y* iff *x* and *y* have some but not all qualitative parts in common.

Fusion (Sum)

(D5) For any *x* and *y*, *x* is the qualitative **fusion** of *y*s iff *x* has all the *y*s as qualitative parts and no qualitative parts that are qualitatively disjoint from the *y*s.[175]

According to Paul, those rules are in contrast with traditional mereological axioms where parts are usually taken to be *spatiotemporal* parts. Thus, central to her observation is that the "same cake of matter can be cut in different ways, the property way and the particle way" (2006, p. 651). These correspond to at least two notions of parthood, the *qualitative* part or the *logical* part, and the *spatiotemporal* part, which reflect two understandings of *material objects*. The traditional mereological understanding of a material object, say, a statue, is to take it as the mere *material contents of spatiotemporal regions*. And its material part is just the content of the sub-regions of the spatiotemporal regions. But as Paul and many others have argued, such an understanding cannot well explain the phenomena of material constitution and coincidence: if material objects are just a whole of spatiotemporal parts and their material contents, then the quality difference between a statue and a piece of clay cannot be grounded, because their spatiotemporal parts are *all they have* at the fundamental level and according to the *Extensionality* of mereology, they cannot be distinct. This conflicts with the widely accepted and intuitive *pluralist* position on material constitution (see Chapter 4(A)).

Note that our focus here is not the correct account of material constitution itself, rather, we try to show that there are good motivations for Paul and others to believe in a more liberal notion of parthood. According to Paul, besides the spatiotemporal and material parts, a statue also has many

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[175] Some mereology systems may not include a definition of sums or something equivalent at all, but the expressive power of those systems would be quite limited. By contrast, the mereology we present here is widely adopted by mereologists and sometimes called General Extensional Mereology because it is one of the nearest alternatives to basic set theory. See also Tsai (2013) for a recent discussion on its decidability.

other *qualities* which can be regarded as genuine *parts* of it. Hence constitution is clearly understood as *overlap*. The difference between the statue and the clay is that they do not share all their qualitative parts, even if they overlap in spatiotemporal parts. Moreover, qualitative parts are more fundamental. Spatiotemporal fusion of particles may give us the statue, but the particles themselves are also fusions of (universal) physical qualities.

1.2   Some modifications

Firstly, note that the term "qualitative part" should not be confused with "qualitative properties" because Paul is clearly open to the possibility that a haecceity could also be a qualitative part of the object in her sense:

> Acceptance of qualitative extensionality is not acceptance of what is standardly taken to be the "principle of the identity of qualitative indiscernibles." This is because by "proper qualitative parts" I mean to include many different sorts of property parts, including primitively individuating properties (if such there be). (Paul 2006, p. 635)

We cannot elaborate all the details here, but *mutatis mutandis* Paul's logical parts or qualitative parts are also comparable with "formal parts" (Koslicki 2008, Chapter 7), "*component parts*" (Lowe 2009. p. 89), "non-*substantial parts*" (Heil 2012, p. 18), and "*metaphysical parts*" (Koons and Pickavance 2014, p. 105). The important thing here is that we do not have to strictly limit "part" only to spatiotemporal parts. Saying a property is a mereological part makes perfect sense. It makes our constituent ontology systematic, eliminating unnecessary and mysterious compositional relations and overcoming some old problems, not only that of material constitution. For instance, the relation "compresence" usually appeals to *colocating* in spacetime (Schaffer 2001), but it cannot deal with the possibilities of *distinct* but colocated bundles, spatiotemporally *scattered* bundles, and even *non-located* bundles (like the indiscernible angles discussed by Paul of Venice in 1503. See Conti 2017). It also does not work well for the famous *Cheshire cat*, who loses its parts in time gradually. If a perdurantist view is taken, we will only have a distinct compresence relation for *each temporal part*, rather than the whole sum (see Le Poidevin 2005). In contrast, our theory faces none of these above issues, and its other benefits will be clearer after the whole picture of our ontology is provided.

Secondly, we do not embrace Paul's property mereology without reservations. Her system seems to assume a certain indispensability of space-time for reality. We agree that there are qualitative parts in the mereological sense, but we might be neutral about whether there are also spatiotemporal parts *plus* qualitative parts, because it is not clear for us whether, using Paul's words, the two ways of cutting the cake are *independent*. If, for instance, *being spatially extended* and being for a certain duration of time themselves are qualities, could not there be a way to reduce one notion of parthood to the other? An extra spacetime besides qualitative parts may be redundant, or at least less important for our current purpose.

Another unique feature of Paul's property mereology is that she, in clear contrast with Lewis (1986) and Sider (2001), argues that only spatiotemporal fusion is unrestricted, in that any two spatiotemporal entities can compose a third spatiotemporal entity, but *qualitative fusion can still be restricted* (2006, p. 655, see also Koslicki 2008). For instance, it seems that there is no substance which has both the colour of my hair and the mass of the Earth as parts. But she does not say explicitly *how* the restriction works. This is partly due to her method being local and empirical. Restricted fusions need to be studied *case by case*.

By contrast, in the next section we will try to give a more general account of fusion's *restriction* by setting out certain rules. But it does not follow that we have to disagree with Lewis and Sider. In fact, following Lewis, there are four theses about mereology composition *itself* we will assume (see Bennet 2015).

Composition is unique—the same things cannot have two different fusions.[176]

Composition is unrestricted—any two things whatsoever have a fusion.

Composition is ontologically innocent—composed entities do not "count" beyond their parts.

Composition is unmysterious—it is not problematic to treat it as primitive, and it can function in demystifying explanations.

In short, we hold that fusions *themselves* are unrestricted but that the restriction concerns which fusions count as *substances* or objects. The notion of "restriction" here is a bit *ambiguous*: some composition can be restricted in one sense but not in another: that two things always compose a thing does not entail that they always compose a third thing of the same category. It is not the case that *traditional mereology* deals with the spatiotemporal parts and our (relatively) novel property mereology deals with a wider metaphysical scope. When we talk about "traditional", "standard" or "classic" mereology in Paul's sense, we should interpret her as talking about the "traditional *metaphysical output* of mereology", rather than the mereology *itself*, which only *defines* the meaning of "fusions" without saying whether the reality is unrestrictedly composed or not as far as substancehood is concerned. For the hygiene of our theory, the metaphysical output of mereology should be distinguished from the formal system itself. This is in line with the founding fathers of mereology (e.g. Leonard and Goodman 1940) who hoped to replace set theory with mereology and held that mereology should be *topic-neutral* (see Varzi 2010).

If the distinction between mereology itself and its metaphysical output is clearly made, then we should say that the *four Lewisian theses* we set out above only concern the formal system. But since the main focus at the moment is only metaphysics, from now on, unless mentioned otherwise,

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[176] Sometimes uniqueness is also called "extensionality". But some philosophers (for instance, Varzi 2008) argue that there are some small differences between uniqueness and extensionality. We will not consider these complications.

we will use the terms "mereology" and "part" liberally to mean the metaphysical version of mereology and "qualitative parts".

That said, there are still many other things undecided in the property mereology outlined above. For instance, it is noteworthy that in developing a property mereology, Paul keeps using the term "object". But not all objects are ontologically on a par. Specifically, given two haecceities h_1 and h_2 and two qualities q_1 and q_2, there should be 11 mereological sums, h_1q_1, h_1q_2, h_2q_1, h_2q_2, h_1h_2, q_1q_2, $h_1q_1q_2$, $h_2q_1q_2$, $h_1h_2q_1$, $h_1h_2q_2$, $h_1h_2q_1q_2$, but *which* of them could be substances? What is the difference between these mereological fusions? (Surely an ontology where *every* entity is trivially a substance is not desirable at all because we need substances to do interesting explanatory work.) Thus, although property mereology in general is well-motivated and applicable to operations with haecceities (given that haecceities are also properties), it seems some extra rules of composition are still required because haecceities are a very special kind of property which is used to analyse substances. Only with these rules can we decide which fusions are substances. This is the task of the next section.

2. Rules of property mereology with haecceity

We take substances to be mereological sums of haecceities and qualities. But this alone does not indicate how to distinguish real substances from other sums. Hence, we will develop three new rules which should be added to a system of property mereology with haecceities. For each rule, we firstly explain reasons for believing it, and then discuss some of its consequences.

2.1 The first rule

(a) *If S is a substance, then there is one and only one haecceity which is S's qualitative part.*

Proof

This entails one substance cannot have more than one haecceity. It follows from the rule of unrestricted fusion that that two haecceities can compose a fusion, but composing one a *thing* does not mean composing a third *substance's haecceity*. (Analogy: two persons can compose a whole, but the whole is not itself a person.) As we mentioned in previous chapters, the haecceity is supposed to be responsible for the unity of substance and no two substances can share the same haecceity. If there are two haecceities, then there must be two and only two substances. Saying two substances can compose a third substance is problematic in many aspects: on one hand, it violates the widely assumed *independence* of substances: either the whole substance depends on its non-substantial parts or the non-substantial parts depend on the whole single substance (Heil 2012, pp. 18-23); on the other hand, it is completely unclear that *how* a third haecceity can be generated by two haecceities. As we defined in Chapter 6 (A), haecceities are supposed to be simple (see also Rosenkrantz 1993). If one haecceity can be said to have two further haecceities as parts, it cannot be simple at all. In describing reality, all qualities and haecceities should be present on the table as elements. A haecceity cannot be a basic

building block if it is composed of other entities. Thus, two substances cannot compose a third substance and two haecceities cannot compose a third haecceity.

Suppose we have two haecceities h_1, h_2, and one quality q. Then there are four fusions, h_1q, h_2q, h_1h_2, and h_1h_2q. According to a), only the former two are candidates for being substances. Neither of h_1h_2 and h_1h_2q are substances.

Application

This rule is not only conceptually plausible but also empirically adequate: the *ordinary* intuition, though not infallible, that a red apple and a yellow banana cannot compose a third substance is well respected: *if* the red apple and the yellow banana are two substances, then there cannot be a third substance composed by them. But we do not have to give up the powerful rule of unrestricted composition in mereology.

2.2 The second rule

(b) *For all the fusions with the same haecceity, **one and only one** of those fusions is the substance.*

Proof

Suppose we have one haecceity h and two qualities q_1 and q_2, then we have four fusions, hq_1, hq_2, hq_1q_2, and q_1q_2. Clearly, according to rule a), q_1q_2 cannot be a substance. Then for the rest of the three fusions with h, there are three exclusive and exhaustive options:

(1) all three fusions are substances

(2) only two of them are substances

(3) only one of them is a substance

They cannot be all substances: if they are, they must be either the same substance or distinct substances. On the one hand, they cannot be the same: because according to the highly plausible *Extensionality* of mereology, if $x=y$, then x and y must have the same parts. But hq_1, hq_2 and hq_1q_2 clearly have distinct parts from each other. They cannot be the same substance. (This also corresponds to two of the four features of mereology endorsed by Lewis: Uniqueness and Ontological Innocence.)

Here it is incorrect to object that being *the same substance* does not mean being numerically the same *simpliciter*, and that they are distinct fusions but can still be the same substance. To the contrary, in the mereology view, a substance is simply identical with the fusion of its parts. Both qualities and haecceities are important. Being a distinct fusion means being a distinct substance.[177] On

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[177] Those who take a perdurantist view about persistence might argue that one and the same substance can have distinct parts over time, but such an intuition seems to rest on a Chisholm-type "loose and popular" notion of identity. Moreover, if our ontology is fully developed, many topics about persistence should be radically reconsidered: for example, if "being temporal" itself is a qualitative part, then saying one thing can have

the other hand, they cannot be distinct substances: if hq_1, hq_2 and hq_1q_2 are distinct substances, then as we argued earlier in the thesis, to solve the Problem of Distinction they must have distinct haecceities[178] but they do share the very same haecceity h.

Thus, Option 1) should be rejected. Similarly, Option 2) should also be rejected. This leaves us with Option 3): only one of them is a substance. The idea seems coherent with all the other mereology rules. The proof not only works for simple cases where are only three elements; it is a general principle.

Application

Again, this rule is not only logically supported but also empirically adequate, at least for many cases. If an apple has N qualities and one haecceity h, it seems odd to say that both the fusion of (N minus 2) qualities and h, and the fusion of N qualities and h are substances. There may be infinitely many fusions overlapping at h, but they cannot be all substances. This will be even clearer if we change apple with *cloud* in our example: there could be many different sets of the water droplets in the sky, and each of them is similar to a cloud, but clearly it would be counterintuitive to say there are many clouds when there seems to be only one. We may further wonder how could the vague boundary of a cloud to be drawn (if it could be done at all), and this is one version of the famous Problem of the Many (Geach 1962, Unger 1980). The worry can be extended to every entity including cats and persons. Of course, we do not aim to solve all the related problems here, but the point is, almost all the solutions to the Problem of Many in the literature try to somehow avoid the radical conclusion that in any room with at least one cat or one thinker, there are millions of cats or thinkers (Hudson 2001, Weatherson 2016). Thus, the second rule we introduce respects this intuition.

Another example: suppose a person has a haecceity h_1 with his quality q_1, and an electron has another haecceity h_2 with its quality q_2, then if it is natural to say a person is a fused substance of h_1 and q_1, then it is not possible to say another fusion h_1q_2 is also a substance, because according to b), it cannot be the case that both h_1q_1 and h_1q_2 are substances: good news for those who do not take the fusion of a person's haecceity and the quality of an electron as a real substance. (But note our rules *themselves* permit such a (possible) radically scattered substance, but other considerations (see below) may still let us not regard it as a genuine substance, or at least not on a par with the usual substances we accept in ordinary intuitions.)

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different *parts at different times* would be a non-complete description of the situation. Note again that, following Paul, by "part", we mean a wider notion of "qualitative part", rather than the limited "spatiotemporal part". We will talk more on the relationship between the intuitive notion of ordinary substances and real substances in next Chapter.

[178] To repeat, on one hand, the distinction of qualities cannot guarantee the distinction of substances non-circularly and their "incompatibility is hard to establish; on the other hand, qualities cannot explain the unity of substances.

Tropes as incomplete substances

There is another noteworthy benefit for saying not all fusions are substances: it can help us to clarify the notion of "tropes". If $h_1q_1q_2$ is a real substance, which we may call *complete*, then because it is not possible to also take the other two fusions hq_1 and hq_2 to be complete, they should be best understood as *incomplete substances*. Given the fact that some early trope bundle theorists like Williams (1986) are also *mereological* bundle theorists in disguise (at least, this is Paul's view), we suggest a *trope* be perspicuously understood as a *junior* substance under this picture, especially when compared with the more recent "modular tropes" (see below) discussed by Garcia (2015).[179] Tropes are rightly called "junior" precisely because they are "incomplete" in our mereological sense.

Haecceity with universal qualities, the incomplete junior substance, can preserve some virtues of the modular tropes without facing their problems. As we mentioned before, a modular trope is in contrast with a modifying trope: the latter itself does not have a character it is supposed to ground while the former does have such a character. But if haecceity and quality (universal) are accepted here, modular tropes will be redundant.

Firstly, believing in modular tropes is not economic as far as how many qualitative properties are concerned. In a case where there is one universal redness shared by two red apples, trope theorists should say there are two tropes, the redness *of this* apple and the redness *of that* apple, and that they are in primitive resemblance; Secondly, tropes, modular or modifying, are often said to be simple (Gibb 2012, 2016; Hakkarainen and Keinanen 2017). But what such a simplicity amounts to has been very controversial (Ehring 2011). By contrast, haecceities and universals are clearly distinct; Thirdly, as we argued before in Chapter 4 (C), according to the "thickening principle", which says e.g. that any red things are also shaped, and any shaped things also have mass, and so on, if a modular trope has many qualities, then we may wonder what distinguishes it from *nominalism*. Both nominalism and modular tropes hold that an apple is a simple particular with certain properties. It seems then that modular tropes are unmotivated.

But effectively, if our interpretation is accepted, the tropes, as incomplete or *junior substances* composed by a haecceity and a universal, can do all the work we needed modular tropes to do: they, as "smaller" parts of the "bigger" substantial fusions, are *mereologically included* in the latter.[180] [181] More generally, the comparison between tropes and our ontology also indicates some

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[179] Note that Garcia himself is sceptical about tropes in general.

[180] Note according to this novel view of tropes, in some sense, tropes can solve the Problem of Distinction in virtue of having haecceities as parts, but this is compatible with what we argued in Chapter 4 (C): simple tropes themselves without haecceities cannot explain the distinction.

[181] There are many other benefits for taking hq_1 and hq_2 as junior substances beyond metaphysics. It matches well with what happens in epistemology: when faced with a complete substance like hq_1q_2, we usually only consider part of it, by adding some properties from the totality of the properties to one haecceity in order to form a substance, which can be used to be the value of quantifiers and the truthmaker of propositions. For instance, the referent of the name "Socrates" can be analysed as the fusion of a haecceity, and some properties we associate with Socrates, like being a philosopher and the teacher of Plato. But that does not necessarily *exhaust*

potentials of our ontology: it can be developed to accommodate other categories (cf. Diekemper 2015).

Note that rule b) itself does *not* say which qualities should go with which haecceity to form the substances. But what it does guarantee is, *if* there has been a substance which is the fusion h_1q_1, then from the purely mereological rules we set up, h_1q_2 would be prevented from being a substance. But then, many may wonder *what* determines whether a haecceity can form a substance with certain properties or not? We will leave this question for the next section. Now let us turn to the third rule of property mereology with haecceities.

2.3   The third rule

(c)   *Every element or fusion must overlap at least one substance when all the relevant elements are abundant.*

Proof

This rule is a bit similar to the Armstrongian *Principle of Instantiation* which requires all universals to be instantiated (but note again that this principle should be separated from the notion of immanence discussed in Chapter 5 because a Platonist could accept the view that all universals must be instantiated without saying universals are immanent in their instances). It says that *no* qualities or fusions of qualities should be left without making any contribution to reality making if there are haecceities which can form substance fusions with those qualities. Our reality has substances with properties, and properties are qualitative parts of substances, rather than existing in isolation from others. The rule precludes the possibility of free-floating qualities which have no particularity. Haecceities are needed precisely to pass on their particularity to qualities, otherwise there could not be any "property instances". We may conveniently call such a role "*haecceitification*" or "*particularization*". A substance is a fusion of a haecceity and some *haecceitified* qualities. (But as we argued several times before, it is not the case that we have haecceities *plus an extra* relation of haecceitification. The haecceity is of its own nature able to *haecceitify* some qualities.)

In other words, rule c) can be viewed as saying that if a haecceity can haecceitify some qualities (to form a substance), it does this *necessarily*. Note that the clause in the rule "*when all the relevant elements are abundant*" is important. A quality q is *relevant* for a haecceity h if and only if it lies in the *nature* of h that it requires q to form a complete substance. Some qualities and haecceities *are relevant elements* if and only if it is possible to combine these elements into complete substances with nothing being left. If one haecceity and some qualities mereologically compose a substance in one world, then that composition is necessary, and it cannot be another world in which *both the same haecceity and relevant qualities exist* but fail to compose the same substance. But things will be

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all the properties which the selected haecceity can form a fusion with, such as some unknowable properties like being a friend of someone.

different if those relevant elements are *not* enough, because then there might be worlds in which a haecceity cannot be part of a substance simply because the universals the haecceity "intends" to haecceitify are not abundant. So, rule c) only works *when these required elements are all there.*[182] In a world with only two haecceities and no relevant qualities, there will be no substance at all. But if all the relevant qualities and haecceities exist, each of them must *overlap* a substance. Analogy: in standard mereology, most metaphysicians hold that if parts x and y compose a whole z, then the composition is necessary when *both x and y exist.* Rule c) says that a haecceity cannot fail to haecceitify its relevant qualities and leave them "uninstantiated" if the haecceity and its relevant qualities already exist.[183] (See Chapter 9 for more details.)

Using a toy model again, if we have two haecceities and two qualities, and assume that the two qualities are all and the only relevant qualities for two the haecceities, then according to c), it is not possible to have a situation where h_1q_1 and h_2q_1 are two substances and q_2 is not part of any substances. In a world with four elements h_1, h_2, q_1, q_2, if h_1q_1 *is one substance*, then we can infer from the rules a) and b) that there should be another substance which is either identical with or includes h_2q_2 or h_2q_1 as a part: rule a) tells us that if h_1q_1 is a substance, then h_1h_2 and all the fusions with it cannot be substances; and rule b) tells us that all other fusions with h_1 as a part cannot be substances as well. Then only h_2q_1, h_2q_2, $h_2q_1q_2$ are the possible candidates for substancehood. But according to the current rule c), h_2q_1 should be rejected because that would make q_2 totally redundant. So q_2 must be fused with h_2 or h_2q_1.

Application

One clear application of this rule is a version of existence *monism*, which holds that there exists one and only one substance in reality. Again, consider a situation with a person and an electron. We have been assuming naturally that that situation should be described as a situation where there are two haecceities and two qualities, but other descriptions are also possible: for instance, we could describe the situation by saying that the person and the electron can be regarded as two qualities q_1 and q_2 instead of two substances, and then if we also assume that there is only one haecceity h whose nature is to haecceitify the two qualities q_1 and q_2, then the question is, among the four possible fusions hq_1, hq_2, hq_1q_2, q_1q_2, which one is the substance? This is similar to the case in Section 2.2 where we explained rule b), but rule b) only tells us there exists one substance among hq_1, hq_2, and hq_1q_2

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[182] Also, there might be worlds in which a quality cannot be part of a substance simply because of the lack of haecceities. This will mean there are "uninstantiated universals" in our ontology (in a weak sense). But whether this is the case will not influence the application of rule c) because it only requires everything is used to make substances when the relevant elements *do* exist.

[183] Note that our first rule is *not* in parallel with traditional mereology itself because although composition is unrestricted for parts and wholes, it is restricted for haecceities and substances. By contrast, the third rule is very similar to traditional mereology because here both the composition of *wholes* and *substances* are necessary for worlds where relevant elements exist. But we still need to distinguish the necessity of mereology and the necessity of substancehood (see Chapter 9).

without telling us exactly which. Now with the help of rule c), we can easily say that only hq_1q_2 is the one substance: because if hq_1 is the substance, it would make q_2 redundant, and similarly if hq_2 is the substance, it would make q_1 redundant, which violates the requirement that all the relevant elements must make a contribution to the substance making, which means haecceitification is necessary when all the relevant elements exist.

So, contrary to our ordinary belief, *if* we treat the person and the electron as two qualities, then which substance we have is certain and determined by the rules we set up. Of course, when there is another haecceity $h*$ in the situation, the possibility of hq_1 being a substance cannot be excluded easily on grounds of rule c), because then taking hq_1 as a substance will *not* make q_2 redundant because of $h*$.

2.4   Systematic understanding

We have established three rules which can help us to decide which fusions are substances. Also, they are all *consistent* and fit together well as a whole system. Before we conclude, it is worth noting that these rules not only help us to select out substances and define the elements' relationships between each other, they can also be viewed as giving a "functional analysis" of haecceities. This does not *reduce* a haecceity to something else, because a haecceity is supposed to have a primitive essence. Rather, it shows how haecceities interact with other notions like substances and universal qualities.

We begin with intuitive understandings of substances and haecceities, then we tentatively propose certain rules to characterize these intuitions, explore their consequences, and test their empirical adequacy. Then those rules in turn govern the performance of haecceities: haecceities are the kind of entities which obey the rules.[184] That is to say, part of the definition of haecceities is fixed by the system of mereological rules above. To a certain extent, to understand how haecceities work in metaphysics is to understand such a system of rules and use it as a guide in making reality with basic elements. If these rules are plausible, then important progress has been made for the ontology of haecceities.

3.   Conclusion

This chapter firstly explained the kind of property mereology we accept, then it developed three new rules about haecceities. Together with Paul's axioms and definitions A1 to D5 and the Lewisian idea that composition is unique, unrestricted, innocent and unmysterious, the three rules below can be viewed as a system of **Haecceity Mereology**.

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[184] The dialectic here is in some sense comparable with the case of laws of nature: our haecceity-mereology is like the Lewisian view of laws, while the direct characterization of haecceity is like the Armstrongian view of laws. The former is practically motivated and the latter is more purely metaphysical. For instance, we will explain the metaphysical consideration for believing rule c) in Chapter 9.

(Ah1) If S is a substance, then there is one and only one haecceity which is S's qualitative part.

(Ah2) For all the fusions with the same haecceity, one and only one of those fusions is the substance.

(Ah3) When all the relevant elements are abundant, every element must overlap at least one substance.

Chapter 8
The Ontology of Haecceities (B): Empirical Humility about Haecceitification

Now it is time to address one worry which arose in last chapter: "Surely, substances are *selective* in *what* properties they can have", the objection goes, "but your ontology is unable to show *how* they do the selection, or *in virtue of* what some properties are included in certain substances rather than other fusions". In other words, our theory seems to hold that two situations (for instance, an h_1q_1-h_2q_2 world and an h_1q_2-h_2q_1 world) can be indiscernible in terms of the fusions they contain (both have four elements) and yet differ on which fusions are substances (in w_1, they are h_1q_1 and h_2q_2; in w_2, they are h_1q_2 and h_2q_1). But this difference between these two situations is inexplicable.

If a person and an electron are two substances, then there cannot be a fused substance with the haecceity of the person and the quality of the electron. This is certainly provable according to our mereological rules. But the question now is, *are* persons and electrons real substances? What is the difference between the fusion of person's haecceity and humanity, and, say, the fusion of a person's haecceity and being negatively charged? Granted, our rules alone cannot guarantee that the persons and electrons are two substances. But as we argued in justifying the third rule of haecceity mereology, haecceities are doing particularization work to bring qualities into their instances. So, we should say that the distinction between a substance-fusion and a nonsubstance-fusion is that only in the former does the haecceity *haecceitify* the qualities. Substances are not simply fusions of haecceities and any qualities; they are fusions where haecceitification exists.

But still, even if substances are the haecceitified fusions, we might continue to wonder what *that* amounts to: What determines *how* haecceitification works? On *what* grounds are we entitled to say that haecceitification happens only in *persons* and *electrons*, rather than other fusions? If we cannot know this, it will indicate that we may be *radically wrong* in our ordinary understanding about what substances are, and then it seems we will have no good ground to say which substances have which properties, and the things we regard to be substances may turn out to be no substances at all. We will be left with a worrying *substance scepticism*.

To respond to this worry, firstly (Section 1), we will argue that there are good non-ontological reasons why we prefer to divide the world in a certain way; secondly (Section 2), inspired by Schaffer (2005), Lewis (2009) and many others, we will argue that even if there is a certain sense in which we can be called "*substance sceptics*", that should not be a serious problem. Neutrality on where haecceitification is in ordinary cases is not a defect; rather, it is a respectful *humility*. Thirdly, we combine our lesson with what we established before in discussing the Blackian spheres. The nature of our solution with haecceities to the Problem of Distinction will be further clarified, before a conclusion (Sections 3 and 4).

Two things are worth mentioning before we start to deal with "substance scepticism". Other philosophical positions may face a similar scepticism: for instance, in moral philosophy, *consequentialism* only says that values of actions are determined by consequences, but leaves it quite open that what the consequence is: on one hand, a person who loves red things can hold that good actions are those which can bring about as much redness as possible (Benn 1998, p. 61). On the other hand, in some situations we might not have a way of knowing what the consequences of an action will be because predicting them can be difficult. So, our discussion is not only important for haecceity ontology, it will be methodologically meaningful for philosophy in general.

Secondly, for reasons we will explain in next chapter, we will not discuss an intuitive and popular solution to the scepticism problem, namely, to add a further metaphysical mechanism to our ontology to decide which mereological fusions are substances. For instance, according to one kind of story, only some qualities can be fused with certain haecceities to form substances while others cannot, and this is *because* of some further metaphysical element (such as *instantiating, compresence*, or Goodman's (1951) *togetherness*). But these proposals betray the spirit of mereology and the necessity of haecceitification (as we will see). There is a gap between ontology and its empirical application. For instance, ontologically speaking, "non-ordinary substances" like the fusion of the Moon and the sixpence in my pocket could be as real as tables or trees. The idea of "compresence", namely, being at the same spatiotemporal region, cannot be used to exclude the existence of scattered substances because it only explains how *we* locate or individuate at most times in practice, rather than how things are in reality.

1.   Some non-ontological considerations: a first look

Which concrete case is a case of *haecceitification* is undecided given our ontology, but still, as we argued, the substances in our ontology are *selective* enough because they are governed by a certain mereology system. More detailed questions, like what determines which properties are included in a substance, may be deeply epistemic or practical. Paul (2006) explains the relationship between ordinary objects and ontological mereological objects in her theory:

> This qualitative fusion of properties of mass, charge, … etc., and location is what I'll call a purely spatiotemporal object. A purely spatiotemporal object is simply matter in a region. Purely spatiotemporal objects will have all their properties essentially on this account, so they are incomplete ordinary objects. Ordinary objects such as persons, bodies, hunks of matter, statues, lumps, minds, brains and the like include additional properties that purely spatiotemporal objects generate by standing in relations to external objects. Purely spatiotemporal objects, qua qualitative fusions, are then qualitatively fused with appropriate relational properties to give ordinary objects. (2006, p. 651)

Here she invites us to countenance not only spatiotemporal parts and logical or qualitative parts, but also *ordinary parts*. In saying that ordinary objects are generated by spatiotemporal objects "*standing*

in relations to external objects", she does not specify what kind of external *objects* she has in mind, spatiotemporal or ordinary. But Paul's key point here is a good attempt: our intuition about ordinary objects sees them as something more than the matter in a region because they also stand in some external *relations*. Here, if the external relations she speaks of include *causal* or *functional* relations, then we can use it to determine how we engage with or use the things we call substances in practice. We may be only interested in qualities which are practically useful or cognitively salient. As Thomson (1998, p. 167) says, we should accept all of those entities even if they are unfamiliar and "we can think of Reality as like an over-crowded attic, some of its contents *interesting*, and most merely junk. There is no need to deny the junk; we can simply leave it to gather dust".

Thus, there are good reasons why we divide the world in the way we usually do. For instance, a huge iceberg on the ocean could seem small to us because we can only see a small portion of it from the surface, yet we only need to evade that small portion in the cruise without worrying how to move the whole of the iceberg, which would impractical and not relevant to our safety. Of course, the danger *is* from the submerged portion of that iceberg, but we only need to evade the smaller portion to avoid that. The empirical world is complicated and there are different *rules* we use in deciding whether to care about something or not (see more in the next section). Sometimes *correlated* things are regarded as a whole, e.g. the four wheels and the body of a car may comprise one ordinary object for the reason that they move together; but sometimes we do not obey that rule: we may not regard two persons shaking hands together as a whole substance. Also, sometimes whether things are *spatially continuous* is important for being an ordinary object, and that may explain why a laptop is an ordinary object and the fusion (sum) of the laptop and a mouse is not. But, again, counterexamples abound: the United Kingdom is not a "united" object because of its spatial continuity, which its thousands of islands simply lack.

Likewise, that a person's haecceity cannot be a substance with an electron's quality must be evaluated against certain *contexts* (see next section). The reason why it is hard to accept an electron's quality and a person's haecceity being fused as a substance is *we have already represented* or *stipulated* the situation as one in which the electron's quality is (substantially) fused with the haecceity of the electron, and the person's quality with his haecceity. (Of course, we are not saying ordinary thinkers also possess the notion of haecceities, but still they identify persons with their qualities, such as being rational.) True, if a person has already been a substance, then according to our mereological rules it is not possible to have another substance *at the same time* which is part of the person's haecceity and part of the electron's entity. The two possibilities, or the two representations, themselves are incompatible. We cannot represent the situation as $\{h_1q_1, h_2q_2\}$ and $\{h_1q_2, h_2q_1\}$ at the same time. The electron-quality-and-person-haecceity possibility is not simply impossible because of

some intrinsic shortcomings, it is just impossible for it to be actualized *after* the other possibility has been taken to be actual.[185]

## 2.	Humility and the possibility of knowledge

More generally, being conservative in identifying substances directly with ordinary objects is not a defect of our system: rather it shows a methodological virtue, a kind of humility.

Consider the initial question: how to decide which haecceity can form a substance with some qualities rather than others? Or, once we are equipped with *haecceitification*, how to decide *which case is a case of haecceitification*? Using the case of persons and electrons again, what determines our world is an $\{h_1q_1, h_2q_2\}$ world, rather than an $\{h_1q_2, h_2q_1\}$ world?[186]

Suppose q_1 stands for being rational, and q_2 for being negatively charged. Both distributions are suitable for making the following proposition true:

(*) There are two substances: one is rational, and the other is negatively charged

The two possible distributions mentioned above are effectively the same *in respect to* (*). Things will be more straightforward if we notice that the electron's haecceity and the person's haecceity themselves are empirically "indiscernible". A haecceity is simple and pure *for us*: we cannot read off its information about which qualities to haecceitify in the same way that we can easily perceive whiteness as something distinct from blackness. All we have been arguing in previous chapters is that two substances are two because there are two haecceities *in total*, which *collectively* grounds the distinction of their substances, rather than *which haecceity is which*.

But one important question to settle now is, is there an intelligible *which-is-which* question at all in the first place? In other words, is the above proposition (*) alone a sufficient and *complete metaphysical description* of the whole reality?

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[185] Here, the question of how we identify substances in daily practice is somewhat analogous to van Inwagen's (1990) famous Special Composition Question. Although the original version of the question is a bit ambiguous, it roughly asks under which circumstances do some objects compose something. Both questions realize that "composition" in the ordinary sense is complex and differently used. The putative "substance scepticism" is well supported especially when the distinction between genuine substances and *ordinary* objects is made. The former is a matter of ontology, and the latter is a matter of appearance and practice. We have many other motivations to doubt the serious ontological status of ordinary objects. Merricks (2001) argues against them from considerations of causal exclusion; in various places Fine (2001, 2009) distinguishes what is real from what exists, and he argues that he is sure that many people exist although he is not sure whether they are real.

[186] Note that our case is just a toy model which is used to show a general point, so there are other complicated theoretic possibilities we will not mention here, like {h1q1, h2q1q2} and {h1q1q2, and h2q2}. Also, as will be clearer later, the kind of humility some Lewisian might have suggested is that we do not know which haecceity haecceitifies which qualities, but structurally, *we can still know that there exist two haecceities*. But it is possible to have another world where there is only one haecceity h with the same qualitative arrangement. If that is the case, it seems that we cannot even know whether some haecceities exist or not. In that sense, the kind of humility would be stronger. A similar point in a non-haecceity context is made in Curtis (2016), where he calls the stronger humility Lewis should have accepted "Diffidence". But for the ease of argument, our main focus will be the h1q1-h2q2 and the h1q2-h2q1 worlds, and we will use the word "humility" in a wider sense.

Some people might argue that given the sheer diversity of primitive haecceities, the two situations are *merely two descriptions of the very same reality*: both worlds have two haecceities and two substances, and one is rational and the other is negatively charged. What more is to be said? Put it more straightforwardly, the question is: *is our "haecceitification" a genuine metaphysical notion?* Those who hold haecceities themselves are metaphysically absolutely indistinguishable would tend to answer in the negative: even almighty God cannot tell which haecceity is which. These people would say that haecceitification is at most an epistemic notion which we use to represent reality in certain way.

However, somewhat controversially, we will hold the two worlds to be two distinct possibilities because even if they are indiscernible from the holistic description (*), the following two propositions are distinct:

(1*) P is rational and E is negatively charged

(2*) E is rational and P is negatively charged [187]

This is because there are two ways to take "rationality" away from a world where (*) holds. We can either let P cease to exist or E cease to exist. More vividly, consider our familiar Blackian spheres. If we replace the spheres with human twins (and even allow that *you are one of E and P*), and suppose that one of the twins *ceases* to exist, then there seems to be two distinct but "indiscernible" possibilities: is not it clear that there is a matter of fact as to which one of the two indiscernible twins ceases to exist? Likewise, we think there are strong intuitive grounds to take (1*) and (2*) to be distinct possibilities. This thought experiment gives us one reason for taking (1*) and (2*) to be interestingly distinct. Using some Carnapian terminology, (*) is a *structure-description* while (1*) and (2*) are two *state-descriptions*. Then, another reason for taking the above two propositions to represent distinct possibilities is that it will provide a good explanation of the difference in *meaning* between (1*) and (2*). The two state descriptions are distinctively *two* precisely because of some *distinction-maker*s (see also Skyrms 1981).

Now we must make a choice, given that there seems to be a real problem of which-is-which: if a world of h_1q_1 and h_2q_2 and a world of h_1q_2 and h_2q_1 are *distinct* worlds, then can we know which one is *actually* ours? If we cannot, then a limitation is imposed upon our theory and we are *substance sceptics*. Which one is the real substance cannot be determined by our experience.

The answer we are inclined to give here is, no, we cannot. This means that we may be radically wrong about which haecceities haecceitify which qualities. But various considerations show that this is an acceptable position.

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[187] Assuming P and E are necessarily non-identical.

Analogy from quiddities

The situation is extremely similar to the one in the debate about quiddities and dispositions. A quiddity is an internal and self-contained nature of a categorical property (Choi and Fara 2012), which is only *contingently* related to any specific theoretical roles it plays (Armstrong 1989, 1997). Two properties are identical if they have the same quiddity. What nomic profile a property has is not essential. The property mass and the property of being negatively charged can "swap" all their causal roles in another world without losing their identities. "All there is to a Humean fundamental quality is its identity with itself and its distinctness from other qualities" (Black 2000, p. 91); "If there is a world *w* distinct from actuality solely over which property confers which power, then we cannot discriminate between actuality and *w*" (Schaffer 2005, p. 17).

Lewis (2009) offers us a detailed defence of this line of reasoning with the Ramsey-Carnap-Lewis method of defining theoretical terms.

> O-language, we assumed, is rich enough to express all possible observations. Therefore, any predictive success for T is equally a predictive success for the Ramsey sentence of T. Since the evidence for T consists in its record of predictive success, there is no way to gain evidence for T that is not equally evidence for the Ramsey sentence. . . *Suppose [T] does indeed have multiple possible realizations, but only one of them is the actual realization. Then no possible observation can tell us which one is actual, because whichever one is actual, the Ramsey sentence will be true.* There is indeed a true contingent proposition about which of the possible realizations is actual, but we can never gain evidence for this proposition, and so we can never know it. If there are multiple possible realizations, Humility follows. (2009, p. 207 my emphasis)

Technical aspects aside, the insight is clear: ontologically, there exists truth about which possibility is actualized, but epistemically we are in principle and systematically ignorant. This echoes a deep philosophical tradition since Kant where the thing-in-itself and the appearance are separated, though supporting some interaction.[188]

In the view of many, quiddities for properties are similar to haecceities for substances (though one important difference is that properties may not have quiddities[189] as real and further constitutive parts in the same way that substances have haecceities). The proposition (*) in our example could be viewed as the "Ramsey sentence" and (1*) and (2*) are two different actualizations. Both positions entail (*). (*) itself seems to be informative, even if which one is actualized is not knowable in principle. What is wrong with such a mild scepticism, or humility? As Lewis famously asks, "Why is

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[188] Note that it is quite unclear that what kind of theory of properties Lewis himself has in mind when he develops the permutation argument in the paper on humility. As Curtis (2016) points out, if properties are transworld sets of individuals, there would be some difficulties. But because we assume properties are realist universals, we do not face the same problem. Our point is just to use Lewis to show how our humility view can be motivated and developed.

[189] One special case is Jacobs (2011, p. 90) where he discusses the idea of "thick quiddities", which have sort of distinctive nature beyond self-identity.

Humility 'ominous'? Who ever promised me that I was capable in principle of knowing everything?" (2009, p. 238).

Contextualism

Lewis's position is not as pessimistic as it seems. It is very similar to the contextualist reply to global scepticism. The contextualists hold that we know we have hands when the global sceptical position is not salient. Our attitudes in a philosophical class should be understandably different from the one we have in a shopping mall or science lab. The question of whether the world exists or not is irrelevant when we do shopping, but that does not make the possibility itself defective. Not surprisingly, as a quiddistic sceptic, Lewis *is* a contextualist:

> S knows that P iff S's evidence eliminates every possibility in which not—Psst!—except for those possibilities we are properly ignoring. (1999, p. 125)

Then we have to use various pragmatic and contextual considerations to find out those possibilities that we can "properly ignore". This requires a number of practical *rules*. As Langton (2004, p. 134) explains,

> There is, for example, a Rule of Actuality, which says that a possibility which is actual is not properly ignored. There is a Rule of Belief, which says that a possibility that is believed to obtain, or that ought to be believed to obtain, is not properly ignored.

Under this view, the reason that I know I have hands in shopping and may fail to know it in a philosophy class is these two situations should be treated differently because of the *rule of attention*: a possibility that is not being paid attention to can be properly ignored. In fact, Langton is right to point out that thinking about too many possibilities by reading her paper may "damage your epistemological health", and adds "proceed at your risk" (2004, p. 129). Luckily, in ordinary contexts, we may properly ignore cases with evil demons. And even if the sceptical worry is worsened after reading Langton's paper, we may soon recover because forgetting our sorrows as time passes seems *proper* enough.

Similarly, we can have plenty of knowledge about haecceities when we individuate familiar objects like persons or tables. The possibility that the haecceity of my friend Mary forms a substance with the quality being negatively charged can be reasonably ignored in ordinary contexts. But in thinking philosophically, we cannot.

Further, one of Lewis's key notions, "naturalness", is also comparable with our notion of haecceitification. For Lewis, a natural property is some real property which can be used to carve nature at its joints, and is also reflected in many scientific concepts. But *being natural itself* is not a metaphysical ingredient which is something *further* than the mereologically composed universe. And it is one thing to say there are scientific laws; it is quite another to confidently find them out.

Similarly, a real substance is a haecceitified fusion, and like naturalness, haecceitification itself is not a further metaphysical ingredient either.

To sum up, we find the contextualist position appealing. In ordinary contexts, cases of haecceitification are presumed to be easily recognizable. Assuming persons and electrons to be haecceitified fusions, namely substances, is coherent and convenient. (In fact, according to Hall (2010), one sense in saying something is *natural* or not, for Lewis, is based on *simplicity in predication*.) But in the philosophy classroom the level of description shifts: we must be careful in granting the status of substance for ordinary objects.

Other non-contextualist ideas

According to Schaffer (2005), we do not even have to be contextualists to deal with property scepticism (or, in our situation, substance scepticism). *Virtually any account of knowledge* can solve the problem well. Schaffer classifies the solutions into several groups. One representative view we are sympathetic with is the *anti-closure* solution, on which the metaphysical indeterminacy is *irrelevant* to our scientific practice. In the case of quiddity, the quiddity possibility will not change the practical *content* of my knowledge. All we need in science, for instance, to make nomic propositions like "All Fs are Gs", or "F=*ma*" intelligible is to have a constant and invariable structure or pattern which is systematically developable within itself. The truth of F=*ma* only requires three distinct entities to play the roles without specifying *which real role-players* are chosen. The law itself is silent on the players behind it; but it is still *multiply realizable*.

Even if the world does not exist physically, we can still do physics as usual. A brain-in-a-vat can still coherently have the feeling and knowledge of practice from its own point of view. Likewise, in the toy model we give, knowing there are two substances, where one of them is rational and the other is negatively charged, may be informative enough for many practical purposes. In general, knowledge about quiddities or haecceities is possible "in the same way that knowledge of the external world is possible, whatever that may be, if at all" and quiddities or haecceities are "one feature of the external world" (Schaffer 2005, p. 23).

There is a question as to which of the theories of knowledge mentioned above is the correct one, though we find contextualism attractive. But no matter which theory we agree with, the general point they all show is clear: how ordinary objects are formed may be not determined by our ontology (or at least the conceptual schema of it). Then we may argue that, whether our ontology itself can guarantee or preclude the substancehood of a person's haecceity and an electron's quality does not matter. Given Lewisian humility, substance scepticism is not a problem.

A Kantian Legacy

Let us summarize the nature of our ontology as follows: in one sense, our theory of substances is purely objective (or realist): how many haecceities and substances there are is certain and mind-

independent; but in terms of qualities, while their number is certain and mind-independent, *how* they are attached to haecceities is not purely transparent—we need to *represent* certain possibilities and combinations, or we need to choose through which route the haecceitification really takes place.

By making such a choice, we run the risk of wrongly identifying the real substances. But there is still a strong *objective constraint* for our representation: that is, once a certain representation is achieved, some others cannot exist at the same time *per the rules of haecceity mereology.* And the wrongly achieved scenario is still informative enough, and may retain most of the important things we hope to do as rational agents.

This is a Kantian legacy: the phenomenal world results from the thing-in-itself and our pure concepts of understanding; it is non-arbitrarily structured by certain *categories*. For Kant, the following two descriptions are totally different:

1. The thing-in-itself is existent but unknowable.[190] All we can know is the phenomenon.

2. The thing-in-itself does not exist at all. All there is and all we can know is the phenomenon.

The first claim is well motivated, while the second is deeply incoherent. On the one hand, according to Kant, it is natural to postulate an ultimate foundation for our knowledge, which also leaves room for freedom and religious beliefs; on the other hand, if the phenomenon is all we have, the word "phenomenon" would lack any meaning, because it is invented precisely because of the distinction between the thing-in-itself and the phenomenon which we are trying to draw in the first place. Hence the phenomenon cannot be all there is "otherwise we should be landed in the absurd conclusion that there can be appearance without anything that appears" (Kant 1787, Bxxvi–xxvii).

Likewise, for haecceity ontology, the following two are also clearly distinct:

3. There is a matter of fact as to which one of the propositions, (1*) and (2*) is realized but we do not know. All we know is the proposition (*).

4. There is no matter of fact as to which one of the propositions (1*) and (2*) is realized at all. All we know is the proposition (*).

Again, no matter whether it is an objective truth or not that a person and an electron are two distinct haecceities, we can certainly say that, according to the objective rules of property mereology, it is an objective truth that, *if* they are distinct substances, then the haecceity in the person and the quality in the electron cannot form a substance. And moreover, in ordinary contexts we have good reasons to believe that it is the case that haecceitification is only found in the person fusion and the electron fusion, and not in other oddly generated ones.

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[190] Here we will not make a distinction between "thing-in-itself" and "noumenon" in Kant's philosophy. Interestingly, some scholars (e.g. Palmquist 1986) argue that only noumenon, not thing-in-itself can give us real knowledge because only the latter is "unknowable".

In this lengthy section, we have argued that we should have a certain humility as to which substances we can correctly identify in ordinary cases. In the next section, we apply this idea to the original spheres case.

3.   Blackian spheres

At this stage, it might be asked whether, if we are humble about what substances there are, then how do we know in our spheres case that there are really two spherical substances? Could not the two spheres be only one *two-spherically-shaped* substance?

Granted, when we seemingly have two spheres in front of us, we may be wrong in automatically interpreting what we see as two spherical substances. But that is due to the very ambiguity of the original thought experiment. Though we make a clear distinction between the ontological framework and the ordinary experience, and argue that the former may be wrongly mapped onto the latter, we still need some minimal and empirical description as our *starting point*. As Kant famously holds the *Critique of Pure Reason*, "though all our knowledge *begins* with experience, is does not follow that it all arises from experience" (1787, Introduction). How we begin to set up the scenario of the thought experiment is one thing, how we analyse it is quite another. In inviting us to have a closer look at the notion of indiscernibility, Black himself may even not have a serious idea of such categories as substances and properties. This is why we have witnessed various positions of the situation: some argue that there are two spherical substances, and others argue that there is only one substance. And we do not know whether there are really two substances or not *exactly because* Black's story is unfinished or incomplete.

But irrespective of what Black himself intended to show, what matters is that there is always an interesting theoretical possibility of two substances. If what we argued above is plausible, both the one-substance possibility and the two-substance possibility are legitimate *starting points*, and whether both possibilities are coherent and attractive metaphysical possibilities is something we need to carefully work out. The main aim of this thesis has been to show that in the two-spheres possibility, two haecceities are needed to ground the distinction of those spheres.

In order to make the Problem of Distinction intelligible, our aim is not directly to *deny* that there could be one substance which *looks like* two spheres; rather, we need to *defend* the possibility that there are two substances from the attack of the one-substance theorists. Some one-substance theorists may find their positions to be sufficient and see our two-substances interpretation as unmotivated. However, as we have argued before, there are various metametaphysical worries which still remain (for instance, it seems "being two" and "being one", as two distinct predicates, cannot have distinct meanings if *all there is* is the very same truthmaker). Also, if the one-substance theorists argue that our situation can be re-described as one substance, we can always construct a new metaphysical possibility where their situation itself is *duplicated*. This is always conceivable and

nothing is incoherent in doing so. That is why we suggest that a better way to argue against the one-substance theorists is *from their own point of view*, as shown in Chapter 5 against the various Universal Bundle Theories. If the conclusion in Chapter 5 is correct, then saying there is only one bi-located sphere is not plausible mainly because of its own problems (e.g. the idea of immanence).

When there *are* two substances, we will have a problem of discerning them. (Note that even if there is only one bi-located sphere, the Problem of Indivisibility arises and haecceities are *still* needed to deal with that problem.) And our solution is that there are two substances because there are two haecceities. The Problem of Distinction concerns finding an explanation of the *holistic or structural fact that there are two spheres*, rather than the pairing problem of which is which. There *are* metaphysical problems about which is which (even with two different *state descriptions*), but that is a different problem which cannot be solved with all we have at the moment. The prima facie argument for haecceities is *not*, as many may misleadingly expect, that haecceities can tell us which sphere is which; rather, the argument is that it is the fact that there are two haecceities in total which grounds the fact that there are two substances in total. Our ontology of haecceities is still well-motivated, even with Ramseyan Humility.

4.   Conclusion

Let us summarize the main conclusions we have established in this chapter. First of all, if a haecceity *mereology* is accepted, a further mechanism should not be introduced on pain of vicious regress; secondly, we discussed some non-ontological responses to the worry of substance scepticism and argued that we should have some *humility* concerning the limits of our metaphysical knowledge about which entity is a haecceitified substance. And the kind of humility we advocate is briefly evaluated against various epistemic positions, especially contextualism. Finally, the dialectic about the two-sphere case and the Problem of Distinction was reconsidered. Theoretically, it is possible to maintain both the one-substance view and the two-substance view, but to make the Problem of Distinction interesting and intelligible, we focused only on the two-substance possibility. But as the nature of haecceitification requires, once a case is given in sufficient detail, which haecceity haecceitifies which qualities becomes a matter of necessity. The nature of such a necessity, and some of its other consequences, will be the main topics of the next chapter.

Chapter 9
The Ontology of Haecceities (C): The Necessity of Haecceitification

The previous two chapters have established two main points: firstly, substances are haecceitified mereological fusions of certain qualities and haecceities; secondly (and epistemically), our identification of haecceitified fusions may not be *infallible*.

Besides how things *are*, we may also wonder *how things could have been*. For instance, if an apple, Mary, is (partly) mereologically composed of a colour, redness and a haecceity, Maryness, then we may ask whether Mary could have been green instead of red? Could Maryness form a distinct haecceitified fusion with another property, say, greenness?

Some people's intuition suggests the answer is yes. However, for reasons to be given in this chapter, we hold that haecceitification should still be *necessary*, and it is *not* possible for Maryness to *not* haecceitify redness when both Maryness and redness exist. And our main task is to find a coherent explanation of some people's intuitions about contingency. The plan for this chapter is as follows: we begin by showing why and in what sense haecceitification should be necessary (Section 1); then after considering some weaker positions which are ultimately unsatisfying (Section 2), we will use ideas from Kripke (1980) and Chalmers (1996) on modal illusions to explain away the intuitions about contingencies. Then we will apply our necessity view of haecceitification to the two spheres case again (Sections 3 and 4). A conclusion is given in Section 5.[191]

1.   Why is haecceitification necessary?

We will argue that haecceitification is necessary in two senses. The first sense should not be very controversial: it is necessary in part because of the innocence of mereological fusion itself. In order to mereologically form a substance with redness, the haecceity Mary (Maryness) does not need *anything else* but certain qualities such as redness: there cannot be two worlds sharing the basic parts while still differing in whether composition happens or not (see Sider 2001). Mereological innocence is a *necessary condition* for haecceitification: any theory which violates mereological innocence will also be incompatible with haecceitification.[192] But mereology alone is not *sufficient* for haecceitification, because it alone does not guarantee the second sense of necessity, the necessity of substancehood:

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[191] As said in the Introduction, although there seem to be modal questions which we need to address, we will try to remain neutral on some hard issues like the ontological status of *possible worlds* (namely, Lewisian *realism* or various versions of *ersatzism*). It is common in the literature that for convenience we can talk about both substances and properties across different worlds. We also ignore those philosophical positions which take the entirety of modal talk to be *unintelligible*. (But if those views are correct, they are still *compatible* in general with the ontology of haecceities developed before.)

[192] This is widely assumed in the literature. Theoretically a non-innocent mereology can still be necessary, but that would be less motivated because the extra bit which makes the composition non-innocent itself can still be taken to be another part. Then the innocence thesis will be true again at a higher level.

even if Maryness and redness necessarily form a fusion, it does not logically follow that the fusion composed by them is always a substance. This is the kind of necessity we will mainly focus on now.

1.1   The origin of unity

One main reason to hold the necessity of substancehood in haecceitification is that it is the only way to see how haecceity can be the origin of unity: once a haecceity and certain qualities are given, it lies in the nature of a haecceity that it can make certain fusions haecceitified. A haecceity is like an unsaturated entity whose role is to unite certain qualities to form a substance (see more below). We hold that if Maryness and redness form a red apple, then they do so necessarily. If in one world a haecceity haecceities a quality, and in another world where the quality exists it fails to do so, then that haecceity itself will be useless in explaining why these worlds perform differently as regards to whether haecceitification exists or not. To elaborate, haecceities are theoretical entities introduced to explain some empirical data and to do the work of haecceitification. It is not the case that we begin with an "inert" or "neutral" haecceity and a quality, *then* we find *something else* to bind them together and make them necessarily coexisting. We need haecceities exactly *because* they deliver necessity for us. This is justified because it is well motivated and solves a variety of problems in a way that some other views do not (see Section 2 below).

According to our model, without haecceities nothing can prevent the qualities from falling apart randomly, and nothing can distinguish a mere sum of, for instance, a redness and a sphericity, from a *concrete* red sphere. Despite their similar forms of grammar, the question "*how* are the redness of the apple and the sweetness of the apple unified into one complete apple?" is essentially different from the question "*how* are the haecceity of the apple and the properties of it mereologically fused into a unified substance apple?" The former addresses a solid empirical datum which we need to explain, while the latter is a pseudo-problem containing a category mistake: the unity we find in an apple *is* just the haecceity of it. Asking *how* a haecceity is fused with a quality is like asking *how a unity is unified with a quality.* The upshot is that the relationship between the colour and the sweetness of the apple, and the relationship between the *haecceity* of an apple and its sweetness, are of very different kinds.[193]

Also, our comparison between the empirical question and the ontological question reveals that the necessity of haecceitification for us is *brute* in that there is nothing *independent* of the haecceity which explains the necessitation role. But this is compatible with the idea that there is something in the *essence* of the haecceity which makes it haecceitify some qualities rather than others.[194]

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[193] This naturally reminds us of what Blanshard (1986, p. 215) says about Bradley's regress mistake, namely that a relation is "*not the same sort of being* as its terms. It is neither a thing nor a quality." See also Alexander (1920), Broad (1933) and Grossmann (1992). See below for more about the regress problem.

[194] Here we will also be neutral on the relationship between our haecceity ontology and "essentialism". As a term of art, "essentialism" has many uses in the literature. Sometimes it is said that "haecceitism" is anti-

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As mentioned in Chapter 6, the consideration of unity can also be seen if we compare our model with other people's ontology. For instance, the main function of Armstrong's (1997) *state of affairs* is to unite particulars and universals. Armstrong's particulars and universals are contingently related (at least on his earlier view), so he needs something beyond these two kinds of entities to do the unification, and to explain how properties and thin particulars get together in such a way that they form a *thick* particular. Thus, in some sense our ontology and Armstrong's ontology have the same concern about unity, and haecceities in our ontology play a similar role to his states of affairs. But as will be shown immediately below, reflection suggests that our route is still preferable: haecceitification is necessary *of haecceity itself* and that relationship comes for free, because if a haecceity and a quality are only put together contingently, then the existence of a haecceity and a quality does not necessitate the truth that "*a* is F". Saying that haecceitification plays the truthmaking role seems very natural. Let us have a closer look.

1.2   Stopping the regress

Related to what we said above, one way to understand the necessity of haecceitification is that we need it to avoid a vicious regress. By saying "it lies in the nature of haecceities themselves that they can haecceitify certain qualities", we mean that haecceitification is not an *external* relation which is *independent* and separable from the qualities and haecceities. If that were the case, haecceitification would have to be somehow reified as an *extra qualitative part* which is disjoint from the haecceities and their qualities. This leaves us with a vicious regress because it is not clear how an independent part can function as the origin of unity of a substance: something *else* must be added to unify the elements together, and so on. Such a vicious regress is a variant of the familiar Bradley's regress (Bradley 1893) which we may encounter in other metaphysical issues. More specifically, if haecceitification (call it H), haecceity, and certain quality (qualities) are three mereologically *disjoint* parts, then we must distinguish the mere fusion of these three parts from a fusion which is also a substance. The difference must be explained by adding another external higher-order haecceitification relation, H*, between the original haecceitification relation H, haecceity and qualities. But in order to further distinguish the mere fusion of H*, H, haecceity and qualities from a substance, it seems another relation H** is needed… *ad infinitum*. Then, it seems such a process of substance-making can never be completed. Thus, our solution is to say that haecceitification cannot be *external* to haecceities. Instead, it must be a *necessary* relation which is internal to its haecceity and relevant qualities.

It is not hard to see that a similar regress problem can be formulated in terms of Armstrongian particulars and universals. What, then, about Armstrong's solution to such a regress problem? As said,

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essentialist because some haecceity views deny any "essential qualitative properties" a substance can have, but this is not the case if a haecceity itself is taken to be an essential property. At any rate, our ontology is not incompatible with essentialism because we take haecceitification to be necessary.

he postulates something else, the *state of affairs*, to stop the regress. (See also Olson (1987) for a similar position with "facts".) But firstly, this has already made his theory less parsimonious compared with our haecceity view (note that we do not have his "thin particular" either), and as Vallicella (2000) points out, it is not clear that a similar regress problem would not reoccur for states of affairs themselves. Secondly and more problematically, Armstrong (1978, 1989) famously says that there is a "non-relational tie" (which is also non-mereological) between the particular and universal, but that is highly obscure at best and incoherent at worst: on the one hand, it is not clear how there can be any "ties" which do not tie any relata: if we have puzzles about "relations", "ties" would fare no better. On the other hand, it seems "being a non-relational tie" itself is also *like a universal* in many aspects, and then again it cannot solve the regress problem (and the unity worry). We will say more about Armstrong's ontology in the next few sections. But for now we should conclude that the idea of necessary haecceitification is still a good choice when compared with states of affairs.

1.3 Other metaphysical mechanisms are also redundant

The point above about vicious regress can be extended to some other metaphysical theories. We can also explain *why* we *cannot* easily save our "substance knowledge" from humility by adding other metaphysical mechanisms to the ontology of haecceities. Recall the possible objection we discussed in the last chapter, "you need to explain why some fusions of haecceities and qualities are substances and others are not". Our reply is that haecceitification is a brute notion and that we have to accept a certain humility and contextualism. But a more popular reply for some people might be that we need something else like "compresence" or "togetherness" to select substances out.

Nevertheless, we should not forget that one main motivation for exploring property mereology is to *unify* the different ways reality is made from metaphysical elements via a general, clear and nonmetaphorical notion of parthood. If a certain new metaphysical element, like *compresence* (Campbell 1990, Ehring 2001), *mutual dependence* (Simons 1994, Perovic 2016), or *togetherness* (Goodman 1951), is introduced *besides* qualitative parts, it seems the objector would still be unsatisfied, because he can repeat the same question: Why does your new metaphysical element, call it E, only exist between a certain haecceity and qualities, and not between others? That is to say, adding E to the picture will not answer the question "Why is there haecceitification only in certain fusions rather than others?", because we can also ask *What determines that E exists only in certain fusions rather than others?*

Put the argument in another direction, if our objectors do want to say, a haecceity itself and qualities are *not* enough to make the substance and something further (i.e. genuinely real), call it E, must be added, then, in the spirit of property mereology, E itself should be just *another qualitative part* of our situation. And then again, to repeat the reasoning adopted by our objectors, we can continue by saying there are two situations, where in the first situation there are haecceity, qualities

and E, and in the second situation there are haecceity, qualities, and E, and haecceity instantiating E and qualities… but why not believe that haecceity has the power of forming substance from the very beginning? In other words, it is one thing whether our world is an h_1q_1-h_2q_2 world or an h_1q_2-h_2q_1 world; it is quite another whether, within each of the worlds, the haecceitification in h_1q_1 and h_2q_2 is necessary or not. The former asks about whether our knowledge about actuality is right; the latter asks, assuming a certain actualized possibility has been chosen, what kind of modal metaphysics we need in the *given* actualized possibility.

To repeat, if haecceity *of its own nature* can form substances with some qualities but not others, then any other metaphysically postulated mechanism does not need to, and cannot, be added to reduce the primitive haecceitification.[195]

1.4   Possibility of non-haecceitifying haecceities

Here a clarification is needed. Recall our third rule of haecceity mereology:

> *Any element or fusion must overlap at least one substance (when all the relevant elements are*
> *enough)*

According to this rule, saying a haecceity (metaphysically) necessarily haecceitifies its qualities only means that in all the possible situations *where both the haecceity and the relevant qualities exist*, there will always be a haecceitification relation. It does not follow that haecceities or qualities *exist* necessarily (even if it would be convenient to assume so). In fact, the later Armstrong has a similar view about his states of affairs. He says,

> It is important to observe that making <*a* is F> a necessary truth does not make the state of affairs *a*'s
> being F a necessary existent. That would follow only if *a* and F were necessary beings. (2004, p. 49)

The metaphysical necessity of *a*'s being F only makes sense when all the relevant parts are existent. Likewise, the necessity of haecceitification does not entail the necessity of the existence of haecceities and qualities. On the other hand, if some qualities in a haecceitified fusion *disappear* in another world, which means there are no qualities to be haecceitified by the same haecceity at all, that does not mean haecceitification is not necessary *when it occurs*. This is similar to the view that composition as identity is *compatible* with the non-universality of composition (although we reject it in Chapter 7): parts are identical with the whole *when the whole of these parts does exist*.

Of course, some may wonder whether it makes sense in the first place to talk about a world where *only a haecceity exists* and its "targeted" qualities do not. In other words, this leaves us with an important question: could there be *nonhaecceitified qualities* or *nonhaecceitifying haecceities*? As we know, for various considerations, Armstrong does not believe in uninstantiated qualities and bare

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[195] Note again that this alone should be distinguished from saying that necessarily every fusion is a haecceitified fusion.

particulars which do not instantiate any qualities. Should similar things then be said about haecceities and the relevant qualities?

Note that Armstrong only denies the *actual* existence of uninstantiated universals and bare particulars (e.g. 1997, pp. 38-41), but it does not follow that they are not even *possible*. Thus, it is helpful here to distinguish two cases of nonhaecceitified qualities and nonhaecceitifying haecceities. The first is a case we will *not* accept:

> Qualities and haecceities in different worlds are the same. In some worlds, a haecceity haecceitifies all the qualities which it requires to form a substance; but in other worlds, the same haecceity either haecceitifies some, but not all the qualities it requires to form a substance, *or* the haecceity does not haecceitify any quality at all).

If the above case is allowed, then, a haecceity will be a nonhaecceitifying haecceity in some worlds and the qualities are nonhaecceitified in those worlds. According to this view, haecceitification is not necessary even when all the relevant parts exist. But this view is incompatible with the view we propose above. (See Section 2.1 for a further evaluation.) Hence, we do *not* believe in nonhaecceitifying haecceities in *this* sense.

By contrast, the second case is:

> Qualities and haecceities in different worlds are not the same. Some haecceity has no qualities to haecceitify in worlds where qualities are not abundant enough.[196]

This view is compatible with our position and mereological rules. It seems not only innocuous to believe in some nonhaecceitifying haecceities *when the relevant qualities are absent*, but also very *useful*. For instance, despite some detailed differences, most haecceity theorists in the literature like to use nonhaecceitifying haecceities as truthmakers for true statements about nonreal entities (Diekemper 2009, 2015, Ingram 2016, 2019).

If the above two cases are distinguished, then on the one hand we can hold that haecceitification is necessary, providing that the full complement of haecceities and qualities exists; on the other hand, there *could be* nonhaecceitifying haecceities. For the ease of discussion, from now on let us assume that the haecceities and qualities are abundant enough.

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[196] For the purpose of our main point, here we will not take a stance on the issue of uninstantiated universals and Platonism (when the relevant haecceities are *not* enough). That partly depends on whether we take possibilias to be *actual* or not. It might be the case that some qualities have no haecceity to haecceitify them in worlds where haecceities are not abundant enough. But even if that is not possible, the points about non-haecceitifying haecceities still stand. Also, one of the popular objections against uninstantiated universals based on what Oddie (1982) calls the "Eleatic Principle" is not very useful in the current context because it is not clear whether we can talk about some extra causal relation *besides* substances and properties, and it also unclear that whether our picture has to be "*naturalistic*" or not. If "naturalism" is defined as the view that everything is in spacetime, then that cannot even be an ontological view at all because "spacetime" itself, as an empirical notion, needs to be categorized as substances or properties in the first place. Finally, it may be argued that uninstantiated entities can still make a causal difference in various ways. In fact, metaphorically speaking, haecceity is like causal power to some extent. We will remain neutral here, however.

Before moving forward to see how to accommodate our modal intuitions within such a necessity framework, let us have a quick look at some other positions. It should be acknowledged that the problems of these positions themselves can also be viewed as arguments in support of our position. If alternatives cannot successfully explain *why* contingencies happen, our initial position will be strengthened again.[197]

2. Some weaker positions

Assuming the abundancy of haecceities and qualities, two positions stand out. The first is the view that haecceitification only happens in *some*, but *not all* worlds. One representative is Maurin (2011). The second is the view that haecceitification does happen in all worlds, but *which* qualities are haecceitified is indeterminate: one inspiration would be from Armstrong (1983). (Maurin and Armstrong are not haecceity theorists but it might be argued that their positions are applicable to our ontology of haecceity.) We begin with the first position.

2.1 Semi-external relations?

Our problem for haecceitification is in some respect similar to the problem of traditional bundle theory: as Maurin (2011) argues, for a bundle theorist, if the qualities are unified by the *compresence* relation, then such a relation cannot be too "tight" (purely necessary/internal) or too "loose" (purely contingent/external): if compresence is internal, then the compresent group cannot change its members, which violates our intuition that Mary, which is red, could have been green; but it cannot be external either because of the danger of vicious regress: what else makes the compresence relation itself and other qualities together? Then, Maurin claims, to solve this problem about compresence we need to propose a middle ground, namely the *semi-external* relation (see also Weiland and Betti 2008). According to Maurin, a relation is semi-external if

> [if] the relation exists so must the relata which it then relates, but the relata may exist even if the relation does not (the relation depends for its existence on the existence of the relata; the relata are existentially independent of the relation). (2011, p. 7)

By saying the compresence relation is semi-external we can allow for contingencies, because the relation does not have to be necessary in that the relata can exist without being in compresence. But also there would be no worry of vicious regress, because the semi-external compresence depends on its relata. Compresence does not have to be *reified* as another independent element. Dependence is intimate enough to fill the putative gap between a fully external relation and its members. When

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[197] A further methodological reason to accept necessity is that necessity should be a view *by default* because only contingencies require extra explanation. (Compare: in physics, force is the reason why a body *changes* its velocity. Forces are needed only when change happens.)

compresence occurs, compresence depends on its qualities; but the qualities *may still exist* without being in the compresence relation.

There is a similarity between Maurin's compresence and our haecceitification: both notions are in some sense *primitive*. It is a brute fact that some qualities are in the compresence relation and some others are not, and it is also a brute fact that some fusions of haecceity and qualities are haecceitified and some fusions are not. But does it follow that we can say something similar about haecceitification using the notion of semi-externality? Can we say that, for instance, haecceitification is a relation which depends on its relata, a haecceity and certain qualities, but it is possible to have a haecceity and the same qualities without the former haecceitifying the latter? And that the red apple, Mary, is the apple it is, partly because of the haecceitification between its haecceity and the quality redness, but the haecceity may fail to haecceitify redness in some possible situation?

We suspect we cannot. There are at least two worries. The first is that the solution with semi-externality seems to work best only with tropes and "compresense". But to believe in universals and the "compresence" of universals will be odd because compresence seems to imply co-location. And universals, as *multiply instantiable* properties by definition, do not have to be constrained by locations. Also, as already noted in this thesis, there seems no be nothing wrong with spatiotemporally scattered substances. In fact, we find the notion of "compresence" itself problematic enough to reject any bundle theory that appeals to it because being "compresent" in spacetime or not has nothing to do with the unity of substances. Being spatiotemporally scattered does not mean a lack of substance unity.

The second, deeper worry is that Maurin's "solution" is ad hoc: the only reason to postulate this semi-external relation is that it saves the bundle theory. But the fact that in our experience some qualities are unified and some are not is *effectively the same* fact that some qualities are related semi-externally and some are not. Why is it that some semi-external relations hold in the actual world and not in some possible worlds, if they have exactly the same qualities (assuming the weaker reading)? By contrast, our haecceity view is not ad hoc because haecceity is a notion charged with many theoretical roles.

Further, note that our initial purpose here is not to doubt the viability of Maurin's own ontology;[198] rather, the point is that we cannot weaken the necessity of haecceitification by making an analogous move. Even if it makes sense to talk about semi-externality for compresence, haecceitification is not comparable. This is because the compresent qualities *themselves* cannot explain the compresence relation *between* them, which, according to Maurin, allows that qualities

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[198] A further problem concerns whether it is intelligible to separate being a unifier from being something fundamental, which is basically what Maurin's idea amounts to. The compresence relation has a nature which guarantees the unity, but it is still dependent upon something else. Clearly, as we said in Chapter 6 (Part C, Section 2.2), the haecceity ontology respects the widely held intuition that something which can be a unifier should also be something fundamental and independent.

may exist without being in the compresence relation. In contrast, in a haecceitified fusion of a haecceity and some qualities, the haecceitification is determined by the parts themselves: the haecceity itself does the work of haecceitification. Speaking metaphorically, haecceity is like an unsaturated entity which has the power to attract certain qualities. This is one of the key motivations behind the third rule in our Haecceity Mereology, which says haecceities and qualities must make contribution to making substances when they can. So, it seems an analogous Maurian move for haecceities will violate that rule. Thus, it seems the notion of semi-external relations does not help.

2.2   Natural necessitation?

The putative "semi-external" haecceitification seems to commit us to nonhaecceitifying haecceities *even if qualities are abundant*, because by definition the two items being related by a semi-external relation may exist even if the relation does not. In that view, although the haecceity may haecceitify the required qualities in some worlds, it does not have to. By contrast, another position may hold that haecceity necessarily haecceitifies *some* qualities, but *which qualities* are haecceitified differs from world to world: a haecceity may haecceitify some qualities in one situation, but may haecceitify *others* in other situations. In some sense, this is like a multi-track power capable of producing different manifestation types for different stimuli. But *within each track*, it can still be said that a power manifests itself with some kind of necessity. A haecceity may haecceitify redness necessarily, but may, in some weak sense, haecceitify other colours in a different world. There cannot be nonhaecceitifying haecceities, but *which* qualities are haecceitified is indeterminate.

According to this position, the kind of necessity involved "within a single track" is weaker than the normal metaphysical necessity. Following Armstrong (1983), we may call it "natural necessitation" (N-relation). For Armstrong, the N-relation, as we find in laws of nature, is a second-order universal which relates some first-order universals. Such a relation is necessary in that it *governs* the performances of its instances strictly: nothing can disobey, for instance, the physical law of motion *within our world*. But Armstrong still insists that the N-relation is contingent and that the same universal can play radically different roles in another world, similar to Lewis's Humility we mentioned before.[199] If Armstrong's natural necessitation makes sense, it seems something very similar can be said about haecceitification and we can call the relation "natural haecceitification". And unlike semi-external relations, it does not violate the third rule in our Haecceity Mereology because every relevant element still has its own role to play for substance-making. The adjustment is only that the members in the set of "relevant qualities" for a haecceity would vary in different worlds.[200]

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[199] Of course they are still quite different in many aspects. For instance, it may be said that Lewis's Humility is more epistemic, rather than metaphysical.

[200] But does it violate the second rule of Haecceity Mereology based on Extensionality which says if hq1 is a substance, then another fusion, hq2 cannot be a substance? This depends on how we interpret it. The initial consideration in developing our Haecceity Mereology was to determine which fusions can be substances given

However, there is a long line of complaints about Armstrong's N-relation. Firstly, some find it ad hoc and mysterious (Lewis 1983, Mellor 1991). Postulating a *sui generis* kind of necessity which is neither metaphysical nor epistemic is not well motivated when compared the more conservative theories. It in fact explains very little when applied to our haecceity view, because all it says is that it is a brute fact that a haecceity naturally necessitates the instantiation of some qualities rather than others without saying that haecceity is the origin of unity. Secondly, it seems to face a vicious regress (Bird 2005): how can the N-relation, as a second-order universal, confer "constant conjunction" on its relata? It cannot be necessary because Armstrong needs universals to be contingent, but it cannot be contingent either because that would make the theory of laws redundant or in vicious regress.

Further, even if the above criticism can be rebutted, compared with other positions, the idea of contingent necessitation may still have some unwelcome consequences for haecceities: it makes the intelligible question "which haecceity is which?" almost *unanswerable*, because under such a view identifying haecceities across possible worlds would be very hard. Saying the two haecceities are primitively distinct itself may not be a problem, but that does not give us any answer to the "which is which" question *when it can be asked*. Here it is helpful to recall the contrast between the *General* Distinction Pair and the *Special* Distinction Pair: the distinction between *an apple and a banana* is much more general than the distinction between *two symmetrical spheres*. In the former case, we cannot only ask the question "Why are there two substances?", we can also ask "Which is the apple?" and "Which is the banana?" because they differ qualitatively. In the Blackian case, however, there is a chance that we might *only* ask why there are two substances because the two spheres share all their universals.[201] The first half of the thesis has argued for the existence of haecceities by answering the questions "Why are there two substance-spheres?" and "Why are the apple and the banana are two distinct substances?". But for the apple-banana case, a further question can also be asked (after their holistic distinction is explained), namely "Which is the haecceity of the apple and which is the haecceity of the banana".[202] Now our point is that if contingent necessitation of haecceitification is accepted, it will make such a question unanswerable.

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some basic elements *within a world*. So, provided within a given "track", which qualities are required for a haecceity is fixed, the N-relation will not violate the second rule. But if a *stronger* reading is adopted, the idea of natural haecceitification may be excluded a prior because the second rule would not allow any change of qualities, and the identity of a substance is rigidly dependent upon its qualities and haecceity. But to make our discussion more interesting, we will assume the weaker reading here.

[201] Again, as mentioned before, the distinction between a special case and a general case may allow for some borderline situations. It may be coherent to hold that even an apple and a banana could be "indiscernible" in some sense (for instance, they share the same structural universals or turn out to be a single extended simple), but the upshot here is that we should not commit to these views if there are more intuitive alternatives, and for most people the apple and the banana are discernible after all. But on the other hand, if these extreme views are true, they will just strengthen our haecceity view: if there are cases of distinction at all, general or not, haecceities should *always* be accepted.

[202] Assuming "the haecceity of the apple" is a rigid designator. If some would disagree with this, we can describe a similar example using proper names.

Our argument here is similar to the epistemic objections against categoricalism (Shoemaker 1980, Black 2000), but cast in a metaphysical fashion. Again, suppose w_1 is an h_1q_1-h_2q_2 world, and w_2 is an h_1q_2-h_2q_1 world and both are metaphysically possible, then the two haecceities h_1 and h_2 cannot be differentiated by appealing to their qualities, because holistically speaking they haecceitify the same set of qualities q_1 and q_2. When a fact that q_1 *is haecceitified* is given, it is insufficient to determine it is haecceitified by h_1 or h_2 in a world.

By contrast, if we hold h_1 necessarily haecceitifies q_1 in all the metaphysically possible worlds (and conveniently suppose q_1 is selective enough so that no other haecceities haecceitify it), then the fact that q_1 is haecceitified will alone be sufficient to determine that the haecceity is h_1 or h_2. In other words, if haecceitification is strictly metaphysically necessary, then we can informatively answer the question "which is h_1 and which is h_2" by saying that "h_1 is the one which haecceitifies q_1 and h_2 is the one which haecceitifies q_2". (Note that this is compatible with what we held in last chapter: epistemically, we cannot distinguish the possibility of the h_1q_1-h_2q_2 world and the h_1q_2-h_2q_1 world and there is always a chance of error. But within a context where one possibility has been represented already, we may still say the haecceitification is necessary. The point here is just that by keeping haecceitification necessary we significantly reduce the number of metaphysically indiscernible pairs. See also Section 4 below.)

In summary, we find our position as developed in Section 1 can keep its original metaphysical necessity without postulating an extra natural necessitation, which makes it simpler and preferable. Now let us turn to explain our modal intuitions.

3.   Explaining away intuitions about contingencies

If the necessity of haecceitification is worth insisting upon, then the main task now is to explain away our modal intuitions about contingencies.

3.1   The "counterpart theory"

The explanation we will offer is a Kripkean *counterpart theory*. Consider the famous case of water and H_2O. Kripke (1980) argues that "water is H_2O" is necessarily true, which means it is not possible to have some water that fails to have H_2O as its essence. But why does intuition still suggest that water could also be composed by something else, say, XYZ? The explanation given by Kripke is that we undergo some kind of *modal illusion* when we think in that way, because what is really conceived is not water, but rather a "counterpart" of water, which is highly similar to but distinct from water. Using another similar case on the necessity of origin, Kripke (1980, p. 142) says the following,

> This table itself could not have had an origin different from the one it in fact had, but in a situation qualitatively identical to this one with respect to all evidence I had in advance, the room could have contained a table made of ice in place of this one. *Something like counterpart theory is thus applicable*

to the situation,[203] but it applies only because we are not interested in what might not be true of a table given certain evidence.

Such a move is not unique in the literature. Despite some minor differences, Chalmers (1996) reaches a similar conclusion by developing a two-dimensionalist semantics.[204] Roughly, according to the theory, a concept "water" could have more than one intension, and the utterance "this table could have been made of ice" can express two distinct propositions, the *primary proposition* which picks out the icy tables in different worlds and the *secondary proposition* (which is the proposition most people would like to express in ordinary contexts) which picks out the worlds with wooden tables only. The person who thinks this wood table could have been made of ice undergoes a modal illusion, because by that sentence she mistakenly describes the situation. She does have something genuine in her mind, but she needs to report it in the right way. Similarly, Kripke (2011) updates his strategy by holding that when people say "water is XYZ", they do not make any serious mistakes about the modal facts, rather, they just use the same sentence to express a different proposition. When "water is XYZ" is uttered in the actual world, it expresses the proposition that water is XYZ, which is false. But when the same sentence is uttered in another world, the speaker just uses it to express the proposition that "XYZ is water-like". Thus, both Chalmers and Kripke agree that the possible watery stuff is something *distinct* from the real water.[205]

A case which is more relevant to our topic can be found in the later Armstrong (2004), where he holds that universals are necessarily instantiated by their instances, and in talking about a possible change in the number of instances of some universal, we are actually talking about its counterpart. Armstrong writes,

> Suppose *a* to be F, with F a universal. If this state of affairs is contingent, then it might not have existed. Suppose it had not existed. The particular *a*, the particular with all its non-relational properties, would not have existed. Something quite like it could have existed instead: a particular with all of *a*'s properties except F. But that would have only been a close counterpart of *a*, because the intersection with F, the partial identity with F, would be lacking. Equally, it now seems to me that the universal F would not have existed. *A universal very like F* could have existed: a universal that had the same instantiations as F except for its instantiating *a*. (2004, p. 47)

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[203] Note here that what Kripke means by "counterpart theory" is quite different from the most popular version developed by Lewis (1986). After all, Lewisian counterpart theory would allow identity to be *contingent* because two things can have the same counterpart in another possible world, which Kripke's theory would not. For a detailed Kripkean counterpart theory, see Ramachadran (2002).

[204] The main difference between Chalmers and Kripke concerns whether "water is H_2O" is necessary posteriori. But they have the same effect as far as modal illusion is concerned.

[205] Again, the real ontological status of that "possible watery stuff", as the so-called counterpart, is controversial. Some hold that the counterpart relation should be defined by some objective *similarity*, while others hold that the relation may depend on our *stipulation*. We will remain neutral on this issue. No matter which theory we choose, the upshot is that we should not misdescribe the situation generated by *other factors* as a matter of modality itself.

If H_2O is the scientific essence of water and being originally made of wood is the essence of a table, then we may say that haecceity and its qualities are the "metaphysical essence" of a substance, and hence the haecceity of the apple and its qualities necessarily exist whenever the apple exists. If the apple loses its redness and gains greenness, then the green apple is just a counterpart of the red apple. If in the actual world, the apple is (partly) composed by a redness and its haecceities, then in a possible world where an apple has most of its qualities unchanged except that the colour is green, we should say that the green apple is just a counterpart of the red apple.

It seems the above proposal can deal well with the transworld cases; but what about the cases of *change within a world*? Cannot a green apple change its property at a time and be a red apple later? We will not go into this problem in detail for the purpose of this thesis, but we can briefly say that it seems nothing can prevent our idea being developed in *temporal* terms. Basically, there are (at least) two directions to go for the change problem, or for persistence in general within a world, and both of them are compatible with the ontology of haecceities. The first way is to say something analogous to the *exdurantism* or stage theory of persistence (see for instance Sider 1996, Hawley 2001, Haslanger 2003): the stage in which an apple is red and the stage in which the apple is green are distinct stages about distinct entities. That would mean that each small stage corresponds to a unique substance with a haecceity and there are many more haecceities (even infinitely many) than we may have expected. If this sounds too counterintuitive, a second way will still be available: like endurantism, it can be said that the identity of properties must be relative to time, and one haecceity can haecceitify many properties like "*being-green-at-time-t₁*" and "*being-red-at-time-t₂*", which will avoid the huge number of haecceities entailed by exdurantism.[206]

Back to the point on modal illusion, now, equipped with a counterpart theory, we should say our modal intuitions on contingencies is compatible with our necessity position on haecceitification.[207]

3.2   More on conceivability

There is a vast literature on the nature of conceivability. Here it suffices to note that saying something is merely conceivable and not metaphysically possible does not mean conceivability is always unreliable in guiding us to metaphysical possibility.

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[206] But as we mentioned in footnote 177, *if* "*being spatiotemporal at p*" is *itself a property*, and *if* properties are mereological parts of the substance, then the whole issue of persistence should be reconsidered because it would make no sense to locate a substance or a property in an extra "spacetime". At any rate, nothing in our theories about haecceities requires a special role for spacetime to play (and this is why we do not assume a possible world is spatiotemporal). We can leave this issue for further research.

[207] It is worth noting a small difference between the kind of necessity Kripke means and the necessity we need in haecceitification. Again, saying a haecceity (metaphysically) necessarily haecceitifies its qualities only means that in all the possible situations where both the haecceities and the relevant qualities exist, there will always be a haecceitification relation. By contrast, it might be natural to hold that, for instance, "water is necessarily H_2O" means "whenever water exists, it will be H_2O". In fact, we may tentatively say that, in "conceiving" a distinct world where water is XYZ, many of us simply assume that H_2O does not exist in that world. The same thing may be too strong for haecceitification unless an abundance of qualities is assumed.

In fact, both Kripke (1980) and Chalmers (1996) argue that pain and the brain's C-fibre firing are metaphysically distinct because it is conceivable that pain is not C-fibre firing. But why cannot we object here by saying that the conceived pain is not pain, rather it is just a distinct *counterpart* of pain? The answer is that in the case of pain, feeling pain *is* just pain. It is not the case that my pain can exist without being felt by me. If I cannot feel it, my pain "itself" simply does not exist. In Chalmers's term, in the case of pain, its primary intension and secondary intension coincide.

But this cannot be applied to water: water has something more than its watery appearance. Likewise, the reason why we can say that other possibilities for haecceities are *merely* (mistakenly) conceivable is that, for instance, the haecceity of a red apple, being Mary, and the haecceity of a green apple, being Tom, can be highly similar as regards which qualities to haecceitify. But they can still be primarily distinct. We can partly know what water is by finding out its qualities, like being transparent and drinkable, but those qualities are not sufficient in fully *determining* water. Similarly, we can partly (and metaphysically) "know" what a haecceity of Mary is partly by knowing *which qualities* it haecceitifies, but that does not mean those qualities are enough to define the haecceity itself. This is where conceivability and metaphysical possibility fall apart: if conceivability is merely to do with *qualities* (we conceive a different situation by conceiving the same apple having different colours), then, when (conceivable) qualities are enough to fully define something like pain, the relevant conceivability can be a good guide to possibility, but for most other cases conceiving qualities is far from enough. This is what Chalmers (1996, p. 367) means by a "gap between what one finds conceivable at first glance and what is really conceivable".

Thus, different kinds of conceivability should be distinguished. For instance, the conceivability of feeling pain without a brain might be said to be *ideal conceivability*; by contrast, the conceivability of water being not H_2O, or Hesperus being distinct from Phosphorus, may be a merely prima facie conceivability. "S is prima facie conceivable for a subject when S is conceivable for that subject on first appearances" while "S is ideally conceivable when S is conceivable on ideal rational reflection" (Chalmers 2002, p. 147). Rational reflection at least requires us to be able to fill in enough details to establish a possibility from a conceivability.

For example, the *feeling* of pain exhausts the most important details for being in pain, but conceiving water as XYZ can be taken to be an *incomplete* description; also, in the prima facie sense we can say that Goldbach's Conjecture can be conceived to be false, but because the mathematical details are still lacking, it is not obviously conceivable in the ideal sense (Yablo 1993).[208] Other wider applications include non-existent objects: if someone hopes to argue for the existence of a flying horse solely because it is conceivable, then it seems she should be able to tell us the colour and the

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[208] Note that Yablo's (1993) position on modal illusion is a bit different from Kripke's and Chalmers's because he holds there are two senses of "possibility" itself, the epistemic and the metaphysical. See also Soames (2005). But that would make our task in this chapter easy and trivial.

size of the horse. The more details she tells us, the more probable it is that the conceivability involved is rationally plausible.

A further observation at this stage is that conceiving empirical cases might be much easier than conceiving metaphysical entities like haecceities. We may simply be not good at using our epistemic abilities in doing abstract metaphysics. This again reminds us of the idea presented in Chapter 8 on humility, and that is also why the main arguments for haecceities themselves are not based on experience, rather, they are based on theoretical and explanatory purposes. In other words, *even if* some objectors insist that they can ideally conceive that water is not H_2O (which is quite improbable), their confidence should not be too quickly extended to abstract cases like haecceities. We may not have any pretheoretical intuition about haecceities at all. And if it is an internal requirement for our theory that haecceitification is necessary, then that constitutes the core meaning about haecceities which we should follow. Issues about conceivability are rich and complex, but it is enough here to conclude that it is far from clear that the conceivability of contingent haecceitification is an ideal conceivability which can be a reliable guide to possibility.

This section has argued that the intuition about the contingency of haecceitification can be explained away. Now let us see what impact this has on our understanding of the two spheres.

4.   Two questions and the spheres again

Related to what we said above, it is again helpful here to draw a distinction between the epistemic question and metaphysical question regarding the haecceitification of qualities. As we argued in the previous chapter, it is possible for us to make a mistake in empirically identifying *which qualities* are haecceitified. But that possibility is merely epistemic: we need to *represent* certain fusions as the haecceitified substances in our actual world. The metaphysical question arises, however, when we assume that our representation is reliable. The metaphysical question is as follows: Among the selected (represented) worlds (including the actual world), if certain qualities are parts of a certain substance in the actual world, then is this necessarily the case? Our argument above suggests that the relation would be (metaphysically) necessary, which is perfectly compatible with the fact that it is epistemically possible that we may undergo a modal illusion.

Returning to the example with two haecceities and two qualities, there are two epistemic possibilities, h_1q_1-h_2q_2 and h_1q_2-h_2q_1. But if h_1q_1-h_2q_2 is taken as the metaphysical possibility, then h_1q_2-h_2q_1 cannot be metaphysically possible, which means in conceiving a world where the two haecceities are swapped, we must be conceiving their counterparts h_1^* and h_2^*.

What about the original two spheres situation? (Note that the case of the spheres is different from the case of h_1q_1 and h_2q_2, because in the latter case we assume nothing can have both q_1 and q_2, namely that h_1q_1 and h_2q_2 are *qualitatively discernible*. But the spheres case has two qualitatively indiscernible spheres.) Again, according to our argument, there are two substances, spheres S1 and S2

(in a world w), because there are two haecceities h_1 and h_2, and they haecceitify the universals of these two spheres necessarily, which means the same haecceity cannot haecceitify a different bundle of universals in another possible world.

Can there be another metaphysical world where there is only one spherical substance which qualitatively looks like two spheres? It is natural to believe so. But can that one-substance world have the same haecceity which haecceitifies one of the two spheres in the two-substances world? This would depend on whether the one-sphere world has exactly the same bundle of universals as the original two-spheres world. If so, then the same haecceity h_1 or h_2 could be there and do its haecceitification work.[209] But if the bundle of universals in the one-sphere world is different from the two-spheres world, then the haecceitification must be done by a distinct haecceity because haecceitification is necessary. For instance, when a one-sphere world is a world where one bundle of universals is bi-located, some may argue that this entails *a difference in universals*: a bundle of bi-located universals may be different from a bundle of singularly-located universals because they have different numbers of instances. Such a problem about the identity of universals is worth investigating (and according to King (1992), this can be taken to be a version of the "*Ockham Problem*" in medieval terms), but it goes beyond the scope of the thesis.[210] Our aim is just to show that if there are two spheres in a world, the ontology of haecceity provides an attractive account of their distinction, and one which solves a variety of other metaphysical problems.

5.   Conclusion

This chapter has argued that haecceitification should be taken to be necessary, and we have sought to explain away our modal intuitions on contingencies. We began by giving reasons to support the necessity position and clarifying in what sense we accept nonhaecceitifying haecceities. Also, the Maurian position and Armstrongian position were found to be unsatisfactory. Then we argued that given the necessity of haecceitification, intuitions on contingencies can be explained away by

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[209] One open issue here is whether, under *Lewisian* counterpart theory, the two haecceities can have the same haecceity counterpart in another world (even assuming for a moment that only individuals and not universals are world-bound, and that haecceities are like "individuals"). If they can, then it might be said that the distinction of the two spheres is contingent. We remain neutral here. At any rate, the *contingency of the distinction* of the spheres is compatible with the *necessity of haecceitification* of each sphere. (In the same way that some philosophers argue that "a" and "b" are rigid designators but may pick out the same entity in some possible worlds (see Stalnaker 2003). And all the main arguments we have made in the thesis are intended to explain the distinction of the spheres within a world. The necessity of haecceitification does not mean the necessity of the haecceity's distinction when the Lewisian theory is accepted. For discussions of the relationship between Lewisian counterpart theory and the two spheres case, see Zimmerman (1997), Curtis (2014) and Calosi and Varzi (2016).

[210] One interesting consequence if we grant that a universal which is bi-located (U1) is a different universal from one which is not (U2) is that, to a certain extent, a single instantiation of the bi-located U1 would be equivalent to two instantiations of the uni-located U2. This will further cause a potential problem for the kind of universal bundle theory we discussed in Chapter 5 because the number of instantiations of the spherical bundle of universals would be *indeterminate*.

appealing to some kind of counterpart theory. There are other possible approaches which cannot be covered here due to limits of space.[211] But if what we argued above is plausible, taking haecceitification to be necessary seems a good theoretical postulate.

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[211] For instance, we can build modality into the expressions of properties. That is to say, the quality being haecceitified is not being red *simpliciter*, rather, it is the property of *being possibly red*. Under this view, haecceities are transcendent over all possible worlds and we do not have to worry about the transworld identity of haecceities. But this novel position is not at all problem free. See Ingram (2016 *b*) and Tugby (2018) for detailed discussion.

Chapter 10
Summary of Conclusions

We hope the previous chapters have demonstrated that (1) when compared with many other theories, the distinction of haecceities best explains the distinction of substances: there are two spherical substances in Black's world because there are two haecceities; and (2) a detailed ontology of haecceities is worth pursuing and can be developed in new ways. Below is a summary of the results we have found throughout the whole discussion.

Chapter 2: The Problem of Distinction challenges us to explain the distinction of one substance from another. But it is not the Pairing Problem (the problem of which is which); and using properties to explain the distinction of two individual substances is also problematic hence we had better treat the special Black-type symmetrical case of distinction and more general cases of distinction uniformly.

Chapter 3: The extant solutions to the Problem of Distinction can be classified as either positive solutions or negative solutions. A positive solution respects our interpretation of the datum of substance-distinction in Black-type cases and tries to provide other entities to explain the substance-distinction. Also, an ideal solution to the Problem of Distinction should obey eight Principles of Evaluation: namely, it must be necessary and sufficient; it must avoid triviality and circularity; it must use entities from a distinct category; ideally, it should not only solve the Problem of Distinction, but also the Problem of Indivisibility and be able to deal with both the special cases and the general cases of distinction; further, a good solution should face fewer revenge problems and finally, it must deliver the right ontological priority: the entities that explain substance-distinction cannot be less fundamental than substances.

Chapter 4: Three representative positive solutions to the Problem of Distinction in the literature, namely, the spacetime points explanation, bare particularism, and trope theory, are all unsatisfactory. In short, firstly, the spacetime points solution is not necessary for two substances to be distinct and may not obey the Priority Principle; secondly, bare particularism is circular because it relies on the very notion of particularity and fails to account for the unity of a substance; thirdly, the trope solution also fails because on one hand, there are reasons for thinking that tropes are transferable, meaning that the solution is not necessary, and on the other hand, the mere existence of two tropes is compatible with the existence of one extended simple, and the "incompatibility" of two tropes is hard to establish without assuming some contentious positions on determinates and determinables.

Chapter 5: The main negative solution, the Universal Bundle Theory is also unsatisfactory because firstly, it does not deal with non-special cases of "distinction"; secondly, the bundle theory in general needs to explain *how* something which is not an object (for instance,

properties or their fusions) can be an object; and thirdly, the idea of *immanence* of universals is problematic.

Chapter 6: The solution that appeals to haecceities is both necessary and sufficient for the distinction of two substances; the idea of a structureless haecceity without a particular individual as its constituent is fully intelligible; haecceities are not less fundamental than substances. The haecceity solution can solve the Problem of Distinction in a way that avoids problems facing rival theories.

Chapter 7: According to our theory of haecceities, a substance is a mereological sum of a haecceity and certain non-qualitative properties. And we developed a system of haecceity mereology. Three rules of haecceities are proposed and explained: firstly, a haecceity is the hallmark of a substance. Two substances do not mereologically compose a third substance; secondly, no two substances can share the same haecceity. Not every mereological fusion that has a haecceity as a part is qualified to be a real substance; thirdly, there cannot be nonhaecceitified properties when haecceities are abundant enough and there cannot be haecceities doing no work of substance-making when the required properties are abundant enough.

Chapter 8: We should accept epistemic humility about haecceitification because our knowledge about which haecceity haecceitifies which properties is fallible, but under certain contexts and practical rules, we still have a lot of knowledge about substances.

Chapter 9: The relation between a haecceity and the properties it requires to mereologically form a substance, is metaphysically necessary. This explains why haecceities can be the origin of the unity of substances and why the theory avoids various kinds of vicious regress. It is also argued that our intuition about contingency of a substance's properties can be explained away if we adopt a counterpart theory about modal illusions.

Here we come to the end of our journey. Debates around haecceities and the Problem of Distinction/Individuation will no doubt continue, and a lot of future work awaits us. There is no royal road to philosophy, but if what we have argued in this thesis has some plausibility, then the road with haecceities and their ontology should be seriously considered.

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