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**The Unity of Composite Substance:
Some Scholastic Background to the *Vinculum Substantiale*
in Leibniz's Correspondence with Des Bosses**

Abstract:

This paper explores the scholastic context of the discussion about the unity of the composite or corporeal substance and the nature of the *vinculum substantiale* or substantial bond in Leibniz's correspondence with Des Bosses. Three prominent scholastic views are examined: Duns Scotus's antireductionist account of the composite substance as an entity irreducible to its essential parts (i.e. matter and substantial form); Ockham's parts-whole identity thesis, which entails a reductionist view of the composite substance; and Suárez's explanation of the unity of composite substance through the presence of a substantial mode of union. It is then shown that Leibniz initially combines a reductionist account of the composite substance, with the *vinculum* playing the role of tie among the component monads. In his last letters, he moves away from this to an antireductionist account of the composite substance, with which he now identifies the *vinculum*.

Key Words: composite substance – hylomorphism – Leibniz – matter – mode of union – substantial bond – substantial form

Length of the text (including footnotes): 13,101

**The Unity of Composite Substance:
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1. Introduction

In the course of his correspondence with Des Bosses, Leibniz introduces the infamous *vinculum substantiale*, which has puzzled generations of Leibnizian commentators. The difficulties raised by its interpretation are many, but they stem from a thread of tangled issues to which this vinculum or bond is devised as a solution. One of them is purely theological, namely the explanation of the Eucharist according to the Catholic dogma of transubstantiation. This has led Russell to dismiss the whole discussion about the vinculum as “rather the creed of a diplomatist than the creed of a philosopher.”¹ But Russell’s dismissive verdict occludes the fact that the vinculum doctrine is not motivated by purely theological concerns but also serves to explain the unity of corporeal substance and to “realize” extension and account for the reality of phenomena. To be sure, Leibniz does not unqualifiedly endorse the reality of a *vinculum substantiale*. Until his ultimate letter, he elaborates his theory as an explanatory hypothesis, under the assumption that at least some bodies are substances and not mere phenomena. Moreover, the vinculum conceived as a tool for coping with difficulties within the monadology actually generates more problems than it solves.

¹ Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, 2nd edition (London, 1937), 152.

My focus here is not on the consistency of the substantial bond with the metaphysics of monads. This has been the object of many studies and the verdict is generally a negative one.² Rather I think that the discussion of the vinculum in the correspondence with Des Bosses is best approached from a historical perspective. As I have said, Leibniz elaborates the vinculum hypothesis to solve a cluster of issues, among which the topic of transubstantiation tends to become peripheral. During the last years of the correspondence, the discussion indeed turns

² Here are some important contributions to the interpretation of the *vinculum substantiale* in the Leibniz literature: Emile Blondel, *Une énigme historique: Le "Vinculum substantiale", d'après Leibniz et l'ébauche d'un réalisme supérieur* (Paris, 1930); Alexandre Boehm, *Le "Vinculum Substantiale" chez Leibniz. Ses origines historiques*, 2nd edition (Paris, 1962); Christiane Frémont, *L'être et la relation*, 2nd edition (Paris, 1999); André Robinet, *Architectonique disjonctive, automates systémiques et idéalité transcendantale dans l'œuvre de Leibniz* (Paris, 1986); Robert M. Adams, *Leibniz, Determinist, Theist, Idealist* (Oxford-New York, 1994), 299-303; Daniel Garber, *Leibniz: Body, Monad, Substance* (Oxford, 2009), 356-82; Richard Arthur, *Ariadnean Threads: Leibniz on Substance and the Composition of Matter* (forthcoming). The French commentators are in general more sympathetic to the doctrine. Brandon Look has provided the most detailed and balanced reading. See Brandon Look, *Leibniz and the "Vinculum Substantiale"*, *Studia Leibnitiana-Sonderheft* 30 (Stuttgart, 1999); 'Leibniz and the substance of the "Vinculum substantiale"', *Journal of the History of Philosophy* 38 (2000), 203-20; 'On Substance and Relations in Leibniz's Correspondence with Des Bosses', in *Leibniz and his Correspondents*, ed. Paul Lodge (Cambridge, 2004), 238-61; 'Preface', in *The Leibniz-Des Bosses Correspondence*, ed. and trans. Brandon C. Look and Donald Rutherford (New Haven and London, 2007) (= LDB), i-lxxix. This paper owes much to these works.

on two intertwined problems.³ The first is about the reality and unity of composite substance: how can a plurality of monads compose a *per se* unity? The second problem concerns the reality of extension: how can bodily extension arise out of non-extended monads? According to Des Bosses, this requires a *realizans phaenomena*, which he conceives as a real accident of the monads and distinct from the *vinculum*. For Leibniz however, the substantial bond achieves these two results. It “formally constitutes the composite substance and realizes the phenomena” (LDB 297) at the same time. An exhaustive study of the *vinculum* should tackle with these two issues.

Here however I will confine myself to the first problem: the unity of composite substance. About the latter issue, Leibniz strikingly emphasizes his agreement with the “Scholastics” in his 13 January letter to Des Bosses:

And in this I think that I am absolutely of the same opinion as the Scholastics; and, in fact, I think that their primary matter and substantial form, namely the primitive active and passive powers of the composite, and the complete thing resulting from these, are really that substantial bond that I am urging.

A few lines later, he concludes his letter by restating the same view:

³ Commentators do not always clearly identify these two issues. See however Boehm, *Le “vinculum substantiale” chez Leibniz*, 24-5 and Lucian Petrescu, ‘*Philosophia peripatetica emendata*. Leibniz and Des Bosses on the Aristotelian Corporeal Substance’, *Journal of the History of Philosophy*, 54 (2016), 421-40, 424. Richard Arthur’s interpretation also separates the issues. But he claims that the first issue is indeed irrelevant, since according to him Leibniz’s metaphysics never abandons corporeal substances. Thus the only role of the substantial bonds is to provide a real continuity, a view Leibniz never holds outside his correspondence with Des Bosses. See Arthur, *Ariadnean Threads*, ch.6.iii.

Therefore, my doctrine of composite substance seems to be the very doctrine of the Peripatetic school, except that their doctrine does not recognize monads. But I add them, with no detriment to the doctrine itself. You will hardly find another difference, even if you are bent on doing so. (Leibniz to De Volder, 13 January 1716, in LDB 365)

Thus Leibniz unambiguously connects his views on the composite substance and the *vinculum* to the “Scholastics”. But this identification is vague and underdetermined as it stands, for the scholastics held a variety of views. Assuming Leibniz’s sincerity, I think that a investigation of these various views will contribute to a better understanding of Leibniz’s own position on the nature of composite or corporeal substance in his letters to Des Bosses. For the medieval and early modern scholastic debates provide the adequate framework to identify the ontological status of the substantial bond and eventually assess its originality.⁴

By the end of the seventeenth century, the problem of the *per se* unity of composite substance was seen as involving two distinct questions. The first concerns the conditions matter and form, which are the essential parts of a composite substance, must satisfy for a composite substance to exist. In other words: when and how do a plurality of essential parts

⁴ In the secondary literature on the *vinculum substantiale*, Boehm’s book (*Le vinculum substantiale chez Leibniz*) is still the only detailed study of the scholastic sources, although Petrescu, ‘*Philosophia peripatetica emendata*’, also deals with this context, but with a focus on Des Bosses’s views. Boehm mainly discusses seventeenth-century scholastic sources and scarcely connects them with the earlier fourteenth-century debate between Scotus and Ockham. But the scope of my study is narrower, for I will not deal with integral wholes and the problem of real continuity.

compose a corporeal substance?⁵ An answer to this question consists in identifying a principle of unity for the composite substance. The second question is about the relation between the composite substance considered as a whole and its essential parts. Scholastics usually phrased it as the question of whether a whole is really identical with its parts taken together. A negative answer to this question entails an antireductionist view of the composite substance, as some distinct thing over and above its essential parts. On the other hand, a reductionist will endorse the parts-whole identity thesis. Reductionists are thus faced with the dilemma of specifying conditions under which a collection of essential parts makes up a *per se* unity, distinct from a mere aggregate, without thereby sacrificing the parts-whole identity thesis.

I will start this survey with the views of Scotus and Ockham, who set the framework for this discussion and put forth two extreme views, antireductionism and reductionism. Then I turn to the discussion of these questions within Jesuit scholasticism, which introduces the terminology of the *vincula* conceived as modes of union. In the final part I show how the various positions within scholasticism contribute to a better understanding of the ontological status of the vinculum and of why Leibniz seems to modify his own account between 1712 and 1716.

In the end, it will appear that the conception of the vinculum that Leibniz reaches in his last letters to Des Bosses is close to some scholastic antireductionist views of the composite substance, in particular to Scotus's own view. This contributes to the correction of what I think is a misinterpretation of Leibniz's view of corporeal substance in his final years. But

⁵ When formulated this way, this corresponds to a restricted version of van Inwagen's "Special Composition Question", which can be phrase like this: what necessary and jointly sufficient conditions must any *xs* satisfy in order for it to be the case that there is an object composed of those *xs*? See Peter Peter Van Inwagen, *Material beings* (Ithaca, NY, 1990).

more generally, this paper indicates how far the discussion between Leibniz and Des Bosses contributes a debate that ran over three centuries.

2. The Problem of the Unity of Composite Substances: Reductionism and Antireductionism in Medieval Debates

There is a general consensus among the medieval and early modern Aristotelian scholastics on the idea that there are various kinds of unities and that *per se* unity represents a higher degree of unity than the unity of an aggregate like a heap of sand, the unity of an army or an accidental unity like a bronze statue or white-Socrates. There was a further consensus on the fact that *per se* unity is not restricted to simple, indivisible beings, since some complex objects *entia per se* and thus also *per se* unities, including corporeal substances, matter-form compounds, which are paradigmatically *per se* beings.⁶ Beyond this minimal consensus however, the scholastics disagreed on the conditions for *per se* being.⁷

According to the traditional Aristotelian hylomorphism defended by Aquinas, what exists basically is the primary substance, identified with the hylomorphic compound, which is

⁶ On the distinction between *per se* unity and lesser degrees of unity – i.e. unity of aggregate, unity of order and accidental unity – see Richard Cross, *The Physics of Duns Scotus. The Scientific Context of a Theological Vision* (Oxford, 1998), 7-8; Robert Pasnau, *Metaphysical Themes: 1274-1671* (New York, 2011), 556-57; Jeffrey Brower, *Aquinas's Ontology of the Material World. Change, Hylomorphism & Material Objects* (Oxford, 2014), ch.1.

⁷ For an overview of the various positions about the requirements of *per se* unity, see Suárez, *Disputationes Metaphysicæ* (= *DM*) (Hildesheim, 2009), IV.3 *passim* (= disputation, section, paragraph).

a genuine *per se* being. Matter and form are not independently existing entities. Rather, the corporeal substance is a primary *per se* unity, resulting from the actualization of matter by a substantial form. This corresponds to Aristotle's own view and there are many places where Aquinas subscribes to it.⁸ However, crucial to the position in Aquinas is the additional claim that primary matter is merely a being in potency, which does not have an independent actual existence. A corollary of this view is that whatever is added to a hylomorphic compound results in an accidental being. From this, Aquinas inferred the Unitarian thesis that no *per se* being can have more than one substantial form.⁹

By contrast, the majority of thinkers after Aquinas endorsed a version of hylomorphism in which primary matter is endowed with its own actuality. Both Scotus and Ockham reject the view that matter is a purely potential being. According to Scotus, matter is endowed with what he calls subjective potentiality, i.e., it is the indeterminate subject of various forms. But once created, matter does not have what he calls objective potentiality, i.e., it is not merely possible, but actually exists. From this, Scotus concludes that formless matter is possible.¹⁰

The kind of hylomorphism defended by Aquinas provides a straightforward solution to the problem of the *per se* unity of corporeal substance: it just results from matter's potentiality

⁸ Aristotle, *Metaphysics*, VII.11, 1037a29-30; VIII.6, 1045b16-24; Aquinas, *De ente et essentia*, cap. 6, in *Opera Omnia*, ed. Leonina (Rome, 1976), XLIII.380a; *Sententia Libri de Anima*, in Lib. II, lect.1 (Rome, 1984), XLV/1.69a.

⁹ Thomas Aquinas, *Sententia Libri de Anima*, in Lib. II, lect.1, XLV/1.71a; *ST I*, q.76, a.3. See Aristotle, *Metaphysics* VII.13, 1039a3-11, where he defends the view that a composite substance cannot be composed out of a plurality of actual substances.

¹⁰ John Duns Scotus, *Lectura II*, 12, q.un., n.37 (Rome, 1950-) (=Vat.) XIX.82; *Reportatio II*, d.12, q.2, n.6 (Lyon, 1631 = Wadding), XI.322.

and form's actuality. By contrast, those who accept the actuality of matter need to account for the unity of a composite substance.

According to Scotus, a composite substance enjoys a special *per se* unity that sets it against lesser degrees of unity. This requires its distinction from its essential parts. One of Scotus's arguments is based on the idea that a *per se* unity has its own essence, which grounds some properties that are irreducible to the essences of the parts.¹¹ Borrowing a somewhat ambiguous term from earlier discussions, he calls this irreducible essence of a composite substance the *forma totius*, which contrasts with the substantial form or *forma partis*. This *forma totius* is not on a par with matter and substantial form: it is not some further essential part, but it denotes the composite's essence.¹²

Scotus adds that the "entity of the whole" (*entitas totius*) is absolute, i.e., not relative. One reason for this claim advanced is that a relative entity cannot possess a *per se* unity. Nonetheless this absolute entity supervenes on the existence of the essential parts and their union. Scotus thus concedes that the union of the essential parts is a kind of relation (*respectus*) required for the existence of the composite substance. But he maintains that the whole must be distinguished from this union. Thus the entity of the whole is both absolute and ontologically dependent. Scotus justifies this by comparing the ontological dependence of the whole on the union of the parts with the (unproblematic) causal dependence of an effect (which is an absolute thing) on the joint action of its causes.¹³ Against the opposite view that a

¹¹ *Ordinatio* III, d.2, q.2, n.77, Vat. IX.150. See Richard Cross 'Ockham on Part and Whole', *Vivarium* 37 (1999): 143-67, at 146-47.

¹² *Ord.* III, d.2, q.2, n.82-3, Vat. IX.152-3.

¹³ *Ord.* III, d.2, q.2, n.86, Vat. IX.155.

composite substance is really identical with its essential parts Scotus's main argument is that it entails that such a composite has no more unity than an aggregate.¹⁴

The view here rejected by Scotus was precisely endorsed by Ockham and, after him, by the *Nominales*. Ockham rejects Scotus's inference on the ground that what distinguishes a hylomorphic whole from an aggregate is the essential complementarity of matter and form. Matter by itself somehow strives to be informed by any substantial form, while substantial forms are perfected by the fact that they inform matter.¹⁵ But for Ockham, this essential complementarity is at most a necessary and not a sufficient condition for the existence of the whole composite substance. Some further conditions must be met. At first, co-location seems to provide such a condition. In the normal course of things, a composite substance exists any time a form is co-located with matter by informing it.¹⁶ However, there are exceptional cases where this does not work. One such case is provided by the *triduum*, during which Christ's rational soul and his body both continue to exist in the same place, while the composite substance corresponding to the human part of the hypostatic union ceases to exist.

Ockham devises various attempts to deal with this problem. His definitive solution consists in claiming that the existence of the composite substance is due to the lack of a distinctness relation between its essential parts. There are two kinds of distinctness according

¹⁴ *Ord.* III, d.2, q.2, n.73, Vat. IX.148-9. See Cross, *The Physics of Duns Scotus*, 81, 85-86; Thomas Ward *John Duns Scotus on Parts, Wholes, and Hylomorphism* (Leiden, 2014), 50-51.

¹⁵ Ockham, *Summa Philosophiae Naturalis*, ed. S. Brown, *Opera philosophica* (St. Bonaventure, NY, 1984), OP VI.138-9; *Quaestiones variae* VI, a.2, eds. G. Etzkorn, F. Kelley, J. Wey, *Opera theologica (= OT)* (St. Bonaventure, NY, 1967-89), VIII.213-4. For commentary, see Cross 'Ockham on Part and Whole', 156-57.

¹⁶ Ockham, *Summa Philosophiae Naturalis*, I, 19, OP VI.208.

to Ockham: according to the first, two things are distinct by being numerically distinct. The second kind of distinctness occurs when two things naturally disposed to unite are blocked by some external factor, as here through God's direct intervention. What leads Ockham to this rather unintuitive position is that on the one hand he wants to maintain that the existence of a composite substance does not require any positive entity in addition to the essential parts, while trying on the other hand to escape Scotus's argument that there is no difference between a composite substance and an aggregate.

Furthermore, Ockham rejects Scotus's argument for the irreducibility of corporeal substance that is based on the principle that any substance or *per se* being has its own essence. He concedes that a composite substance possesses proper passions, as for instance the capacity to laugh in man. However he claims that the essence of a composite substance must itself be composite. As a result, its properties are themselves complex and supervene on the properties of its simple, essential parts, and the subject of complex accidents of the whole is just the sum of its essential parts.¹⁷

Finally, Ockham argues that denying parts-whole identity entails an infinite regress. Suppose the whole is some entity distinct from matter and form. Ockham asks: what about the whole whose parts are this distinct entity, and its matter and form? If it is some further distinct entity, this opens an infinite regress. If on the other hand this whole is identical with its parts

¹⁷ *Quaestiones variae* VI, a.2, OT VIII.216-17; *Reportatio* IV, q.9, ed. R. Wood, G. Gál, OT VII.163-64. For commentary, see Cross 'Ockham on Part and Whole', 163-66. The capacity to laugh is just a combination of properties of the essential parts of man: the movements of its mouth, representations and emotions of his intellectual and sensitive soul.

then it is not a distinct entity after all.¹⁸ Scotus had already devised an infinite regress argument for the conclusion that the *forma totius* is not a further component of the composite substance, alongside its matter and substantial form or *forma partis*.¹⁹ But whereas Ockham's infinite regress argument excludes the claim that the whole is itself a *thing* distinct from the collection of its parts, Scotus's regress argument establishes that the difference between a *per se* unity and a mere aggregate cannot consist in the addition of a further metaphysical component on a par with the other essential parts.

Scotus and Ockham decisively shaped the discussion about the unity of material substance for the next three centuries. They represented extreme positions between which most scholastics, and the Jesuits in particular, tried to steer a middle path.

3. Composite Substances as Requiring Substantial Modes of Union: Some Jesuit Views

Although there are important debates among the Jesuits about the unity of corporeal substance, these disagreements rest on a set of shared assumptions, which are clearly articulated by Francisco Suárez. Against Scotus and Ockham, Suárez rejected the plurality of substantial forms.²⁰ Yet, he sided with the former by maintaining that prime matter possesses its own

¹⁸ *Summa Philosophiae Naturalis* I, 19, OP VI.206; see Cross 'Ockham on Part and Whole', 149-50.

¹⁹ *Ord.* III, d.2, q.2, Vat. IX.152.

²⁰ *DM XV.10 passim*. Suárez claims that his strongest argument for the unity of substantial form is that substantial forms are required to account for the unity of the various causal powers of a thing. The pluralist undermines the most important reason for endorsing substantial forms. See *DM XV.10.64*. For more on Suárez's Unitarianism, see Dennis Des

actuality. Thus Suárez argues that because corporeal substance is a composite and a composite substance cannot be composed out of non-substances, matter must possess its own actuality (*DM XXXIII.1.5*). Therefore even if Suárez and the Jesuits more generally did not have to account for the unity of a composite including a plurality of substantial forms, they were confronted with the more localized but no less fundamental problem of obtaining a *per se* unity out of two actual components.

On the one hand, Suárez rejects Scotus's antireductionist view and claims instead that a composite substance is not distinct thing (*res*) in addition to its parts taken together. Ockham's regress argument is widely used in this context.²¹ Another argument is based on the redundancy of the whole with respect to the parts: to conceive the whole, it suffices to conceive all of its parts. Therefore the entity of the whole is redundant.²² To borrow a commonly used example from contemporary debates, when you buy a pack of six bottles of milk, you do not buy seven objects, i.e., the six bottles plus the putative entity of the pack. Rather the pack is just the six bottles taken together.²³

Chene *Physiologia. Natural Philosophy in Late Aristotelian and Cartesian Thought* (Ithaca and London, 1996), 90f; Pasnau *Metaphysical Themes*, 576-87; Christopher Shields, 'The Reality of Substantial Form : Suárez, *Metaphysical Disputations XV*', in *Interpreting Suárez. Critical Essays*, ed. Daniel Schwartz (Cambridge, 2012), p.39-61; Dominik Perler, 'Suárez on the Unity of Material Substance' (forthcoming).

²¹ See *DM XXXVI.3.10*. See also Pasnau *Metaphysical Themes*, 683.

²² *DM XXXVI.3.10*.

²³ This example is generally used by those who endorse the view known as "Composition As Identity, namely that a whole is "nothing over and above" its parts or is identical to its parts. See Aaron J. Cotnoir and Donald Baxter (eds), *Composition as Identity* (Oxford, 2014).

On the other hand, Suárez does not straightforwardly embrace the parts-whole identity thesis. The mere existence of the essential parts is not sufficient to guarantee the existence of the whole, since some conditions have to be satisfied. Co-location is indeed a necessary but nonetheless insufficient condition (*DM XV.6.4*). This is shown by the case of Christ's rational soul and body during the *triduum*. Against Ockham and the nominalists, Suárez maintains the necessity of positing a ground or something in virtue of which a composite substance exists. This ground is not full-blown thing, but it is nevertheless a positive entity, which he calls a substantial mode of union:

But that what this composite adds to both parts is nothing else than a substantial union is proven from the fact that without this union, it is impossible that the whole substance arises [...]. Conversely, once this union is posited, the whole results immediately from both parts, even if everything else is suppressed. Therefore the whole substance adds this union to the aggregate of its parts. Finally [...] this union is not a distinct thing, but only a real mode. (*DM XXXVI.3.8*)

Modes are contrasted with things, which are characterized as independent entities.²⁴ In general, any two things are mutually separable, i.e. each can exist independently of the other.²⁵ Mutual separability is the “sign” of a real distinction. The category of things is

²⁴ The idea that the systematic use of modes represents Suárez's original contribution to ontology is now well entrenched. See Pasnau *Metaphysical Themes*, 244-75, and Stephen Menn's pioneering paper, 'Suárez, Nominalism, and Modes', in *Hispanic Philosophy in the Age of Discovery*, ed. Kevin White (Washington, DC, 1997), 226-56.

²⁵ See *DM VII.2.10*. This claim has to be qualified however, because Suárez admits some exceptions (*DM VII.2.24*). Thus God and creatures are really distinct although no creature could exist without God. Suárez admits another exception in Trinitarian theology: each

broader than that of substances, as it includes also the real accidents of quantity and quality. By contrast, modes are dependent entities: they exist only insofar as they modify a thing. In addition, any mode is essentially a mode of one thing. This means not only that modes are ontologically dependent on things, but also that they are non-transferable items. I will use the label “rigidly dependent” to characterize an entity satisfying these two conditions.

The ontological load of these modes is a debated interpretive issue. On a deflationary reading, modes of union are ways of being of matter and form, when such ways of being are interpreted as consisting merely in certain relations. According to this interpretation, Suárez’s account of the unity of “composite substances” would differ only slightly from the

Person is really distinct from the two others, although they cannot exist separately (*DM* VII.2.27). Real relations are another exception, for a relation is inseparable from its terminus, but it is nevertheless really distinct from it (*DM* VII.2.26).

nominalists' view.²⁶ But the deflationary reading conflicts with other passages where Suárez claims that modes are real entities, even though not full-fledged things.²⁷ In his view, modes have their own positive existence. Furthermore, Suárez contrasts the mode account with the nominalist identity thesis because the latter does not have the resources to distinguish a composite substance from an aggregate:

A composite substance is really distinct from matter and form taken together or as an aggregate (*aggregatim sumptis*), insofar as it includes both and adds a real substantial

²⁶ Thus in his initial account of the unity of composite substance, Ockham seems to ground the existence of the composite on what he calls a *respectus unionis*, which can be understood as a relational mode. See *Ordinatio* I, d.30, q.4, OT IV, III, 369-70. This reading is defended against the dominant view that Ockham rejects modes by Magali Roques, *L'essentialisme de Guillaume d'Ockham* (Paris, 2016), ch. 4. Some later nominalists, such as Gregory of Rimini, argue the composite substance results from matter and form being suitably related. See Gregory of Rimini, *Lectura super Primum et Secundum Sententiarum*, I, d.24, q.1, a.1, ed. D. Trapp and V. Marcolino, III, *Super Primum dist. 19-48* (Berlin, 1984), 25-26. The fact or state of affairs consisting in the parts being united is a necessary condition for the existence of a *per se* unity. What differentiates the situation in which only matter and form exist from the situation in which a composite substance exists is the state of affairs consisting in this form informing this particular matter.

²⁷ *DM XLVII.2.8*: "...[J]ust as the mode is distinct in reality from the thing itself of which it is a mode, so it has some proper existence (*aliquod esse proprium*) and proportionally distinct from the existence of the thing itself [...]. Again, just as the mode is something existing in reality, so it can be said to have some entity, insofar as this word signifies anything that is not nothing".

union between them, which is something distinct in reality from them and their aggregate, not as some really distinct thing, but as a real mode. (*DM XXXVI.3.8*)

Suárez thus wants the distinction between an aggregate and a composite substance to be grounded in reality without falling prey to the infinite regress argument. Only a mode, conceived as a positive entity, can achieve this. Modes of union are not further ingredients on a par with the composite's essential parts. This allows the Jesuits to escape the charge of infinite regress.

While there is a general agreement among the Jesuits on the need for substantial modes of union, there are diverging accounts of the nature of such modes. The main debate is about the number of modes required for the existence of the composite substance. Francisco Suárez and Pedro Hurtado de Mendoza represent the two main views among the Jesuits: Suárez admits a single mode of union, while Hurtado contends that there are two modes. This *prima facie* purely formal debate actually reflects some deep problems raised by the very idea of a substantial mode of union within an Aristotelian framework.

With Suárez, the human being becomes the paradigmatic case for conceiving of the union of the parts in a hylomorphic compound.²⁸ By contrast with material forms, the rational soul subsists by itself, hence its production is distinct from its union with matter. Suárez calls it a “pure union”, that is a union of form with matter without inherence.²⁹ This union is a

²⁸ The existence of natural composites coincides with the production of the material form and its inherence in matter. In this case, the mode of union consists in the inherence of form in matter. See *DM XIII.9.13*; *XV.2.15*, 3.10, 4.5.

²⁹ *DM XV.2.10* and *XV.6.8*. On the rational soul's union without inherence in matter, see *DM XXXIV.5.30-34*.

mode, a kind of tie or bond, a *vinculum*, which is common to matter and form and somehow shares their opposite natures:

[O]ne should say that this mode of union is a sort of medium or chain between the form and the matter, and it, therefore, touches and affects both in some way and, hence, depends on both in its coming to be and in its being. As a result this mode of the rational soul, although it is in its own entity something spiritual, nevertheless participates in the conditions of a material thing because it both completely depends upon matter and is in its own way extended along with matter, although it does not have extension on the side of the soul. (*DM XV.3.11*)

Suárez thus thinks that a single mode of union guarantees that matter and form compose a *per se* unity. This mode is mysterious: it is both spiritual and material since it participates the natures of both matter and the rational soul. But it seems to be a startling consequence of Suárez's view that union is a polyadic property, i.e. a property that belongs to more than one subject. Such a consequence appears to follow from two further assumptions, namely (i) that modes essentially depend on the things they modify; (ii) that there is no reason that the single mode of union should belong to matter rather than to the rational soul.

Pedro Hurtado de Mendoza strictly sticks to these two requirements. This leads him to claim that in corporeal substances there are two distinct modes of union, associated with the causality of the material and formal causes, "information" and "materialization", respectively.³⁰ These two modes are really distinct from one another and are only partial unions.³¹ Their joint existence generates the existence of the whole composite substance.

³⁰ P. Hurtado de Mendoza, *Universa Philosophia* (Lyon: 1617), *Physica*, disp.V, sec.7, §62, 290: *Dico igitur informationem et materializationem esse duos modos realiter distinctos [...]*

While this dualist view is perfectly consistent with the basic constraints of the inherence of modes and the rejection of polyadic properties, it also renders the *per se* unity of the composite deeply problematic. The partisans of Suárez would raise the following objection: in virtue of what do this particular mode of matter and that particular mode of form combine to constitute such a unity? Given the real distinction between matter and form, each could exist with its own partial mode of union without the other, so that the existence of these partial modes does not guarantee the existence of the composite.³²

By contrast, the idea of a common bond or *vinculum* is in a better position to achieve this, but it seems incompatible with the two requirements on modes imposed by the Aristotelian framework. Suárez tries to maintain the inseparability of modes from their subject and the rejection of polyadic properties by saying that the single mode of union modifies a single subject, namely, the substantial form.³³ An alternative answer would deny the mode's existing in either form or matter, which would conflict with the principle that

in homine materializatio et informatio distinguuntur realiter, patet consequentia; quia idem modus non potest esse spiritualis et materialis, nisi ratione distinctarum partium.

³¹ P. Hurtado de Mendoza, *Univ. Phil.*, Phys., disp.V, sec.4, §27-29, 280-81.

³² Hurtado formulates the objection and tries to answer it by distinguishing a perfect union (including two partial unions) and a composite based on an imperfect union (with only a single mode, e.g. *formalizatio* without *materialization*). See P. Hurtado de Mendoza, *Univ. Phil.*, Phys., disp.V, sec.7, §52, 287.

³³ As an alternative reading, one could say that the composite substance is the subject of the single mode of union. But Suárez could not accept this since the mode of union partly grounds the composite substance's existence and it seems strange to say that a mode can inhere in that to which existence it contributes.

modes essentially modify their subjects. This is suggested by Antonio Rubio, who compares the mode of union of essential parts with points as the entities that join integral parts. A point joining two lines does not modify either, but adheres to both. By analogy, one could say that a single substantial mode of union adheres to both matter and form. The common mode of union would then “adhere” to two subjects (matter and form) but would not modify either.³⁴ Another option is to relax the ban on polyadic properties. Rodrigo de Arriaga goes in this direction by accepting that the mode of union might modify two subjects, matter and form because there is no reason why it should be received in one subject rather than in another³⁵. To justify this exception to the general ban on polyadic properties, he adds that the reason why the same relational accident cannot inhere in two subjects is because of the spatial distance between the subjects of reciprocal categorical relations. Since the mode of union requires the co-location of matter and form, it can actually inhere in both matter and form.³⁶

4. Setting the Stage for the Substantial Bond

³⁴ See Antonio Rubio, *Commentarii*, lib. I, tract.2, q.6, §68, 176; for commentary, see Boehm, *Le “Vinculum Substantiale” chez Leibniz*, 76-80

³⁵ Rodrigo Arriaga, *Cursus philosophicus*, Phys. disp. IV, sec.2, subs.1, §47, 299a: *licet quaelibet unio partialis respiciat aliquid ut terminum, et aliquid ut subiectum, unio tamen totalis ut totalis formaliter utrumque extremum respicit ut subiectum et utrumque ut terminum*. For the argument, see *ibid.* subs.4, §118, 308a. On Arriaga’s theory of relations, see Sydney Penner, ‘Rodrigo de Arriaga on Relations’, *The Modern Schoolman*, 89 (2012): 25-46.

³⁶ Arriaga, *Cursus philosophicus*, Phys., disp.IV, sec.2, subsec.2, §§56-57, 300a.

The overview of the scholastic debates about composite substance and modes of union helps us to understand the nature of the *vinculum substantiale* in Leibniz. As I said in the introduction, although the vinculum is first discussed in the context of transubstantiation, as the correspondence develops, this issue fades away and Leibniz is preoccupied with its role in connection with the unity and reality of the composite substance.

To appreciate Leibniz's views in connection with the scholastic debates, it is enlightening to start with Des Bosses own way of approaching the matter. Somewhat surprisingly, although himself a Jesuit, Des Bosses does not defend the substantial mode of union account of the *per se* unity of corporeal substance. Rather his view is *prima facie* closer to Aquinas. Thus he maintains that a composite substance is unified by a single act of existence. What constitutes a corporeal substance is the absolute existence of the whole composite (LDB 18-9; 246-47; 258-59). This endorsement of what Pasnau calls the "singular existence thesis" is reminiscent of Aquinas.³⁷ However Des Bosses is not an orthodox Thomist either, for he also allows that a single substance contains a plurality of substantial forms, provided a single form endows the whole with actual existence, while the other forms are merely potential (LDB 246-47).

This position is a non-starter according to Leibniz, for monads always have a "full existence". Against the potential parts view associated with Des Bosses's suggestion, he maintains that the monads in a composite are unqualifiedly actual. Moreover, the monads that make up the composite substance are all endowed with their own substantial forms, or primitive active force. Thus the framework in which Leibniz elaborates the problem of the unity of the composite substance is undoubtedly pluralist, with respect to both the actuality of the essential parts and the plurality of substantial forms. The unity of the composite is not

³⁷ See Pasnau, *Metaphysical Themes*, 623-29.

explained by the singular existence of one monad; instead Leibniz claims that it requires a “superadded substantial bond” (*a vinculo substantiali superaddito*; LDB 256-57).

To get a better grasp what Leibniz is proposing here, it is necessary to note that his account in the letters to Des Bosses differs markedly from the account of corporeal substance developed elsewhere in writings from the same time period.³⁸ First, there are many passages that express a commitment to idealism, with mind-like monads as the only substances and everything else being phenomena reducible to monads and their internal states.³⁹ As is well

³⁸ Here I analyze the notion of corporeal substance, without delving into the interpretive debate whether Leibniz is basically a realist or an idealist, whether he turns from realism to idealism, or how whether he could consistently combine both views. For “standard”, idealist interpretation, see Adams, *Leibniz, Determinist, Theist, Idealist*, and Donald Rutherford, ‘Leibniz as idealist’, *Oxford Studies in Early Modern Philosophy* 4 (2008): 141-90. Some commentators claim that Leibniz shifted from a realist metaphysics of corporeal substance endorsed during the “middle years” to idealism in the later years. See Garber, *Leibniz: Body, Substance, Monad*. According to some, Leibniz has inconsistent two views on the reality of corporeal substance; see Glenn Hartz, *Leibniz’s Final System* (London and New York, 2007). Finally, some commentators hold that Leibniz maintained the reality of corporeal substances throughout his mature writings, from the 1680s to the time of his death. See Pauline Phemister, *Leibniz and the Natural World* (Dordrecht, 2005); Justin H. Smith, *Divine Machines. Leibniz and the Sciences of Life* (Princeton-Oxford, 2011); and Richard Arthur, *Ariadnean Threads*.

³⁹ The best-known statement appears in a letter to De Volder: “Indeed considering the matter exactly, it should be said that there is nothing in things except simple substances, and in them perception and appetite” (Leibniz to De Volder, 30 June 1704, G II.270).

known, even within the correspondence with Des Bosses, Leibniz does not entirely give up this idealist option.

Leibniz affirms the reality of corporeal substances in other passages. There are however various conceptions of corporeal substances. According to a first conception devised during the 1680s, Leibniz thinks that substances are primarily living beings or animals, and neither form nor matter are independently existing things. Following D. Rutherford and B. Look, we may label this the “Unity View”.⁴⁰ On another conception, a corporeal substance comprises a matter, which is itself an aggregate of smaller corporeal substances, and a substantial form, which endows this (secondary) matter with a *per se* unity.⁴¹ This corresponds to the “Composite View” of corporeal substance.

When he develops his theory of monads in the early eighteenth century, Leibniz identifies the soul with a dominant monad, and offers a reductive analysis of the secondary matter as being ultimately constituted by other monads, which are subordinated to the dominant monad. This view figures prominently in a passage from the letter to De Volder of 20 June 1703, where Leibniz articulates a five-part ontological scheme:

I therefore distinguish: (1) the primitive entelechy, i.e. the soul; (2) matter, namely primary matter, i.e. primitive passive power; (3) the monad completed by these two things; (4) the mass, i.e., the secondary matter, i.e., the organic machine, for which innumerable subordinate monads come together; and (5) the animal, i.e., the corporeal substance, which the monad dominating in the machine makes one. (Letter to De Volder, 20 June 1703, GP II 252/LDV 265)

⁴⁰ Look and Rutherford ‘Preface’, LDB xlii. For textual reference see in particular, A VI.4B.1507-8/LOC 285-87.

⁴¹ See Letter to Arnauld, 9 October 1687, G II.119-20.

This passage calls for three comments. First, although indivisible, a monad is somehow a hylomorphic compound, as it comprises a form, which is its primitive entelechy or force and corresponds to a soul, and matter, what Leibniz calls primary matter, also equated with primary passive power. As on the Unity View, neither entelechy nor primary matter can subsist separately from the monad. Commentators call the view that corporeal substance is such a composite the M-Composite View.⁴²

Second, Leibniz claims that the secondary matter is an extended “mass” resulting from a plurality of monads. This mass is not by itself a *per se* unity. But when it is joined to a “dominant monad”, the resulting entity is an animal or a corporeal substance, presumably endowed with *per se* unity. This aggregate of monads is the body, with which the dominant monad is associated. Leibniz adds that each monad has such a body.⁴³

Third, and most importantly for our purposes, one may wonder in virtue of what does an aggregate of monads plus a single monad make up a composite substance. In the letter to De Volder and other texts from the same period, Leibniz claims that this is achieved by the presence of relations of monadic domination. This is a technical notion, which Leibniz quickly defines in a letter to Des Bosses: “domination and subordination consist only in degrees of perception” (LDB 256-57). What Leibniz has in mind is a relation that is more

⁴² Letter to Bierling 1711, G VII.501: “I call a corporeal substance that which consists in a simple substance or monad (that is a soul, or soul-analogue) and a united organic body”. For the label “M-Composite View” see Look and Rutherford, ‘Preface’, li-liii. For discussion, see Paul Lodge, ‘Corporeal Substances as Monadic Composites in Leibniz’s Later Philosophy’, in Adrian Nita (ed.), *Leibniz’s Metaphysics and Adoption of Substantial Forms* (Dordrecht, 2015), 107-24.

⁴³ See in particular *Principles of Nature and Grace* §3, G VI.598-99/AG 207.

restrictive than the relations of expression of one monad by many others. The degree of perception is not sufficient though, and a more adequate account of monadic domination consists in saying that monad *a* is dominant over monad *b* when the reason for the state of *b* is contained in *a*. It can be understood as a kind of functional dependence of lower monads on higher ones. In the letter to De Volder, Leibniz presupposes that for each animal there exists a unique closed chain of functional dependence descending infinitely downwards. The monad occupying the top-level plays a distinctive role, as it is the soul of the animal, whereas all monads that are both subordinated to some monad and dominant with respect to others constitute the organic body.⁴⁴

With these preliminary remarks, we may turn to Leibniz's own account of the ontological status of the substantial bond. As Brandon Look has established, one may extract four distinct accounts of the ontological status of the vinculum from the correspondence: (1) as a relation; (2) as a substantial form; (3) as the whole composite substance or a "bond of substances"; finally (4) as a substantial thing superadded to the monads in a composite substance.⁴⁵ The first two readings receive prima facie textual support from the correspondence. Indeed, Leibniz seems to identify the vinculum with a substantial form in the 19 August 1715 letter (LDB 351). However this cannot represent his considered view. Indeed

⁴⁴ For various interpretations of monadic domination and its role in an account of corporeal substance, see Brandon Look, 'On Monadic Domination in Leibniz's Metaphysics', *British Journal for the History of Philosophy*, 10 (2002), 379-99; Ohad Nachthomy *Possibility, Agency and Individuality in Leibniz's Metaphysics* (Dordrecht, 2007), 215-35; Shane Duarte, 'Leibniz and Monadic Domination', *Oxford Studies in Early Modern Philosophy*, 5 (2011), 209-48.

⁴⁵ Look 'Leibniz and the Substance of the "Vinculum Substantiale"', 210f.

a substantial form or entelechy corresponds only to the primitive active force of a substance. But then it is difficult to see how the passive force of the composite substance could arise from a purely active vinculum.⁴⁶ The relation view receives stronger support, for the appendix to the 15 February 1712 letter in which he first develops his account of the vinculum contains a description of it as a kind of relation, a “more perfect” relation compared with spatiotemporal relations (LDB 232-33). Yet this interpretation is inconsistent with the thesis of the ideality of relations, a thesis to which Leibniz unambiguously subscribes in the correspondence.⁴⁷

Thus it seems that (3) and (4) are the only two serious candidates. It is difficult to adjudicate between the two by means of a purely systematic approach.⁴⁸ However, the historical investigation in the preceding section provides interesting results here. For it appears that the model of the vinculum as consisting in the composite substance itself identified with a complete bond of substance, as in (3), is similar to the reductionist account of composite substance. By contrast, the vinculum as a substantial thing added to the monads, as in (4), can be read along the lines of the antireductionist account defended by Scotus. Moreover, as the correspondence evolves, Leibniz moves from an initial account that is broadly reductionist to a later account that is antireductionist. One of the reasons for this

⁴⁶ See also Look ‘Leibniz and the Substance of the “Vinculum Substantiale”’, 212.

⁴⁷ This is further discussed in the next section. Among the commentators, Frémont defends the *vinculum*-as-relation interpretation (*L’être et la relation*, 41, 69).

⁴⁸ André Robinet (*Architectonique disjunctive*, 88) supports (3), i.e. the identification of the substantial bond with the whole bonded set of monads. Brandon Look provides strong reason to see (4) as corresponding to Leibniz’s final position at the end of the correspondence; see ‘The Substance of the “Vinculum Substantiale”’.

change of view is that, confronted with Des Bosses's questions, Leibniz realized the inconsistency of his first account.

5. First Stage of the Vinculum Theory

The first detailed statement of the vinculum theory appears in this passage, which is worth quoting at length:

If corporeal substance is something real over and above monads, as a line is taken to be something over and above the points, we shall have to say that corporeal substance consists in a certain union, or rather in a real unifier superadded to monads by God, and that from the union of the passive powers of monads there in fact arises primary matter, which is to say, that which is required for extension andantitypy, or for diffusion and resistance. From the union of monadic entelechies, on the other hand, there arises substantial form; but that which can be generated in this way, can be destroyed and will be destroyed with the cessation of the union, unless it is miraculously preserved by God. But such a form then will not be a soul, which is a simple and indivisible substance. And this form, just like matter, is in perpetual flux, since in fact no point can be designated in matter that preserves the same place for more than a moment and does not move away from neighboring points, however close. But a soul in its changes persists as the same thing, with the same subject remaining, which is not the case in a corporeal substance. Thus, one of two things must be said: either bodies are mere phenomena, and so extension also will be only a phenomenon, and monads alone will be real, but with a union supplied by the operation of the perceiving soul on the phenomenon; or, if faith drives us to corporeal substances, this substance consists in that unifying reality, which adds *something absolute* (and

therefore substantial), albeit impermanent, to the things to be unified. (Leibniz to Des Bosses, 15 February 1712, LDB 224-26)

Here the vinculum is meant to achieve the unity of the corporeal substance. The problem is to interpret the status of the latter as “something real over and above monads” (*aliquid reale praeter monades*) This can mean either (i) that the corporeal substance is a real entity, by contrast with a mere aggregate, or (ii) that the corporeal substance is a distinct entity from the set of monads composing it. The first option does not entail but is compatible with the reductionist view, whereas the second reading entails antireductionism. A second problem concerns the meaning of the last sentence of the passage, where Leibniz claims that “this substance consists in that unifying reality” (*substantiam illam consistere in illa realitate unionali*). This might mean either (iii) that the vinculum is identical with the corporeal substance, or (iv) that the existence of the corporeal substance presupposes this vinculum. Comparing these two pairs of interpretive options with the scholastic views, we can see that their combinations correspond to the three scholastic views that were examined:

A. (i) and (iii) = reductionism without modes of union (Ockham)

B. (i) and (iv) = reductionism with modes of union (Suárez)

C. (ii) and (iv) = antireductionism with a relation of union (Scotus).⁴⁹

Does any of these positions match Leibniz’s own initial account of the substantial bond? According to this account, the corporeal substance has both a primary matter and a substantial form or entelechy. Its primary matter results from the passive powers of the monads that enter into it. From the union of the monads’ entelechies, there arises the form or primitive active power of the corporeal substance. The Leibnizian corporeal substance thus satisfies the scholastic criterion for having being *per se* entity, i.e. having an essence. The composite’s

⁴⁹ The combination of (ii) and (iii) is not a live option.

essence consists in its primitive active and passive forces. Leibniz describes the relation of the composite substance's primitive force, either active or passive, to the primitive forces of the monads in the same terms: "from the union of the passive powers of monads there in fact arises primary matter" and "From the union of monadic entelechies, on the other hand, there arises substantial form". This suggests a purely additive model: the composite's active force is the sum of the active forces of its component monads and its primitive passive force is the sum of the passive forces of those monads. The composite substance does not have distinct irreducible primitive active and passive forces. This is quite similar to the reductionist approach defended by the nominalists.

Leibniz adds that the form of the composite is not a "simple and indivisible substance". In addition, the matter of the composite is subject to constant change. The monads that enter into a composite substance are not fixed. At various times, the corporeal substance results from different sets of monads. Leibniz concludes that the corporeal substance does not strictly persist over time, but is in a "perpetual flux", by contrast with indivisible substances or souls, which truly persist. This consequence, namely, that composite substances do not survive the change of their essential parts, was endorsed by the defenders of the reductionist account. Thus Ockham had claimed that only that which does not change with respect to its parts remains truly identical over time; hence the human intellectual soul persists in virtue of its indivisibility. But since the parts of a living body undergo a constant change, natural substances do not strictly persist. But Ockham is prepared to loosen this strict consequence and claims that if a "principal" part remains, the whole can somehow be said to persist. Thus a human being can be said to remain numerically the same in virtue of the persistence of its intellectual soul, whereas animals, plants or quantities of water, which lack an indivisible

form, cannot be said to remain identical even in this looser sense.⁵⁰ In the passage I am commenting, Leibniz does not subscribe to the relaxed thesis on persistence. Nevertheless, his endorsement of the more radical thesis that composite substances do not survive the change of their parts is evidence that Leibniz's initial account of the *vinculum* is reductionist.

Leibniz's initial remarks concerning the *vinculum* also look compatible with the substantial mode of union account defended by the Jesuits. For Leibniz seems to claim that the mere existence of the monads is insufficient for the existence of the composite substance and that a substantial bond should be added precisely for this reason. Moreover, just as a mode of union is rigidly dependent on the things it unites, Leibniz claims here that the substantial union cannot survive the change of the monads, which amounts to saying that it is rigidly dependent on the monads it unites.

For these reasons, Des Bosses was naturally led to suggest to Leibniz that he endorse the substantial mode of union view. In his letter dated 12 December 1712, he remarks that the unity of the composite substance is explained by the relation of domination and subordination among monads and interprets this in terms of the existence of correlated intrinsic modes within the dominating monad and the set of subordinated monads (LDB 285). To a Jesuit like Des Bosses, this could be seen as similar to the two-mode view of Hurtado. He adds that once substantial modes are accepted, "it is not at all necessary that that absolute bond enter into the constitution of a substantiated thing" (LDB 289). Thus he sees the mode of union account as ontologically economical.

⁵⁰ Ockham, *Reportatio* IV, q.13, OT VII.257-77. Ockham envisages that in animals, some material part (for instance the heart) could remain unchanged over time, securing the diachronic identity of the animal. See OT VII.268-9. For commentary, see Calvin Normore, 'Ockham's Metaphysics of Parts', *Journal of Philosophy* 103 (2006), 737-54.

However, Leibniz rejects both Des Bosses's specific suggestion and, more broadly, the mode of union account. A general argument against modes of union is that they do not intrinsically modify the monads (LDB 371-73). For the only modifications of monads are their perceptions and appetites. However both Leibniz and Des Bosses accept the view that phenomena are not changed by the reality of corporeal substances. This premise remains undisputed and is crucial if the vinculum is to work into an account of transubstantiation.⁵¹ For the substantial change in the Eucharist must preserve the phenomena of bread and wine.

Moreover, Leibniz cannot accept the substantial mode account of the vinculum precisely because modes are rigidly dependent on the things of which they are modes. This entails that modes are non-transferable items. But this is incompatible with the role of the vinculum in an account of transubstantiation, which is one of its functions.⁵² Against Des Bosses, Leibniz thinks that transubstantiation requires a change of vinculum while the same monads that once entered into the composition of wine and bread remain while entering into the body of Christ (LDB 171).

Leibniz also offers specific arguments against various versions of the modes of union. First, he finds the two-mode view is unintelligible (LDB 304-5). More importantly, Des Bosses assimilates the dual modes of union to monadic domination and subordination. But now, Leibniz judges that these relations are insufficient to account for the reality of the composite substance: "Composite substance does not consist formally in monads and their

⁵¹ Des Bosses rejects this however and for this reason he tries to explain transubstantiation through a change of monads. See LDB 259 and 283.

⁵² LDB 321: "if there is something that constitutes corporeal substance, you should seek the possibility of transubstantiation in it". See Look, 'Leibniz and the Substance of the "Vinculum Substantiale"', 213 and 218.

subordination, for then it would be a mere aggregate, that is, an accidental being” (LDB 371). The argument stresses the insufficiency of monadic domination as an account of the unity of composite substances and motivates the need for a substantial bond over and above the monads.

Leibniz also argues against the single-mode account of modes. His argument is based on his ontology of relations:

If the substantial bond were an accident or a mode, it could not be in several subjects at the same time. And hence there will in fact be no substantial bond of many monads, but in any particular monad there will be an appropriate modality relative to another monad; and so, again, bodies will be mere phenomena. (LDB 319)

Here Leibniz argues that if the substantial bond were a mode, it would inhere in a single subject. As a real unifier, however, it would have to inhere in a plurality of subjects. But since each monad has its own inherent modes of union, this would amount to the two-mode view and bodies would be reduced to phenomenal aggregates, because there would be nothing more than a harmonious correspondence among the states of different monads (LDB 327). If one were to accept (as on Arriaga’s account) that substantial modes of union inhere in two subjects, they would indeed unify the monads, but a central assumption of Leibniz’s ontology of relations is that polyadic properties are not real, as he reminds Des Bosses:

For I believe you will not admit an accident that is in two subjects at the same time. Thus I think the following about relations: paternity in David is one thing, filiation in Solomon another, but the relation common to both is a merely mental thing, whose foundation is the modifications of the individuals. (LDB 327)

Leibniz alludes here to a distinction between a relation as a relational accident inhering in one subject and a relation understood as a polyadic property, that is the relation considered out of their subjects (*hors des sujets*; cf. GP VII, 401). As we saw above the rejection of polyadic

properties was an almost undisputed assumption among the scholastics, with Arriaga being a notable exception.⁵³ As a result, relations insofar as they are conceived as existing in two subjects are only ideal things (LDB 371). But the vinculum is supposed to be real and substantial. Therefore the substantial mode cannot be a mode common to a plurality of monads. This is important because, as we saw above, in the supplementary study to the 15 February 1712 letter, Leibniz seems to describe the vinculum as a relation among the monads:

Through these [relations of space, time and intercourse], things seem to us to form a unity, and truths in fact can be expressed concerning the whole that are also valid according to God. But over and above these real relations, a more perfect relation can be conceived through which a single new substance arises from many substances. And this will not be a simple result, that is, it will not consist in true or real relations alone; but, moreover, it will add some new substantiality, or substantial bond, and this will be an effect not only of the divine intellect but also of the divine will. (Leibniz to Des Bosses, 15 February 1712, Supplementary Study, LDB 233)

Appearances notwithstanding, there is no inconsistency in Leibniz's rejection of the common mode of union. Contrary to ordinary relations, this "more perfect" relation does not supervene on the intrinsic modifications of the related monads. Leibniz expresses this point in terms of the different divine faculties involved: since relations of order supervene on the intrinsic properties of their terms, they merely require God's conceiving those terms. This agrees with

⁵³ For Leibniz on relations in general, see Massimo Mugnai, *Leibniz' Theory of Relations* (Stuttgart, 1992), and 'Leibniz's Ontology of Relations: A Last Word?', in *Oxford Studies in Early Modern Philosophy* 4 (2012), 171-202. For the discussion of relations in the letters to Des Bosses, see Look, 'On Substance and Relations'.

Leibniz's claim elsewhere that God's understanding is the ground of the reality of relations.⁵⁴ In the letter to Des Bosses, he relates it to God's knowledge of vision (*scientia visionis*). God's *scientia visionis* might play a role in a rival account of the reality of bodies or phenomenal aggregates, but this need not concern us.⁵⁵ What matters here is the intended contrast with the "more perfect relation", which requires from God an additional act of will. The reason is that this new relation of union is itself based on the creation of the vinculum as an entity distinct from the monads and their modifications. Thus the substantial bond is not itself a relation, but the *foundation* of a new relation. To emphasize the fact that this foundation is not a mode, Leibniz calls it an absolute thing.

To recapitulate, Leibniz's first account of the vinculum does not correspond exactly to any historical precedent, since he combines a reductionist account with an account of the vinculum as an absolute entity. But all parties within the scholastic debate thought such a position would entail an infinite regress, as has been shown above. The same concern is implicitly at work in an objection devised by Des Bosses:

There is another reason why I would prefer that the substantial bond of monads required for the constitution of a composite substance be a mode rather than an absolute entity, namely, that every substance affirms essentially the coexistence of all its parts, but every absolute entity seems able to exist without any other absolute

⁵⁴ See for instance *New Essays* II.xiii.17, A VI.6.227.

⁵⁵ Thus according to Donald Rutherford, God's *scientia visionis* is an alternative to the *vinculum substantiale*: aggregates are God's phenomena, i.e. objective phenomena, by contrast with the mere appearances of substances. God's perception of spatio-temporal relations provides the principle of monad aggregation. See Rutherford, 'Leibniz and the Problem of Monadic Aggregation', *Archiv für Geschichte der Philosophie* 76 (1994), 65-90.

created entity that is distinct from it. Therefore, no collection of absolute entities alone (think of the collection of a human soul monad and of an absolute substantial bond) can adequately constitute the complete substance that is called a human being. (Des Bosses to Leibniz, 8 August 1713, LDB 317)

The argument may be reconstructed as follows:

- (1) Every composite substance signifies essentially the coexistence of its parts.
- (2) Every absolute entity can exist separately from any other absolute entity.
- (3) Therefore no collection of absolute entities is sufficient by itself for the existence of a composite substance.

The first premise is a reformulation of the parts-whole identity thesis. The second is equivalent to an understanding of an absolute entity as a thing to which real distinction applies. In this respect, an absolute entity is contrasted with a mode and may denote either a substance or an accident. Admittedly, there is no explicit mention of an infinite regress. However it is clearly the impossibility of such a regress that makes Des Bosses's argument valid, given a missing premise, namely that a positive ground beyond the essential parts is required to distinguish a composite substance from an aggregate. Then if this additional ingredient is an absolute entity, (2) applies and a further ingredient is needed to ground the *per se* unity, and so on *ad infinitum*.⁵⁶ Des Bosses uses the argument as a justification for the view that a composite substance requires a substantial mode of union in addition to its matter and form.

⁵⁶ Brandon Look suggests a similar objection ('Leibniz and the Substance of the "Vinculum Substantiale"', 220, n.25), but connects it neither with Des Bosses nor with the scholastic background.

Leibniz's short reply to this argument is particularly interesting as it coincides with an important evolution of his conception of the vinculum: "I would not think of saying that a substance is a concurrence of its parts, for otherwise it would be an aggregate" (LDB 321). What Leibniz thus denies is premise (1) of our reconstruction, which was precisely a reformulation of the reductionist view of composite substance that he seemed to endorse in his earlier letters. Interestingly, Leibniz's reason for denying (1) is exactly the same as Scotus's, namely that only an antireductionist view can account for the distinction between a substance with a *per se* unity and a mere aggregate.

6. The Later Stage of the Vinculum Theory

This refutation of Des Bosses's argument for substantial modes of union coincides with a new formulation of the vinculum doctrine. A few lines earlier in the same letter, Leibniz claims that he retracts his first account of the vinculum by now denying that the composite substance is in a perpetual flux:

Having considered the matter, I change my opinion to this extent: I now think that nothing absurd arises, if indeed the substantial bond or the substance itself of the composite is said to be ingenerable and incorruptible, because I think that no corporeal substance should really be admitted, except where there is an organic body with a dominant monad, or a living thing, that is, an animal, or something analogous to an animal. Everything else is, in fact, a mere aggregate, or an accidental unity, not an intrinsic unity. Since, therefore, as you know, I deny that not only the soul but also the animal dies, I shall therefore say not that the substantial bond, or the substance of the animated body arises and passes away naturally, but that, since it is something absolute, it only varies according to the changes of the animal. Hence corporeal

substance, or (*seu*) the substantial bond of monads, although it requires monads naturally or physically, does not require them metaphysically, since it is nonetheless not in them as in a subject, and so it can be destroyed or changed, while the monads are preserved, and accommodated to monads that do not naturally belong to it. Nor is any monad besides the dominant monad even naturally attached to the substantial bond, since the other monads are in a perpetual flux. (Leibniz to Des Bosses, 23 August 1713, LDB 319-21)

Leibniz refers here to his claim in many contemporary texts that the organic body associated with each monad is as indestructible as the monad itself.⁵⁷ In the initial account of the vinculum, Leibniz saw its corruptibility as a consequence of its rigid dependence on the monads. The inference is now reversed: the persistence and incorruptibility of the vinculum entails its ontological independence. In turn, by stressing the independence of the vinculum Leibniz invites its identification with a substance-like thing, which is more clearly endorsed in the letters after 1712.⁵⁸

⁵⁷ See for instance G IV.395/AG 253; 480-81/AG 140-141 VI.545-46; GM III.565/AG 171; *Principles of Nature and Grace* §6 G VI.599/AG 209; *Monadology* §76-77, G VI.620/AG 223.

⁵⁸ See LDB 304: *substantiam compositam seu vinculum substantiale*"; LDB 371: "*vinculum reale, seu substantiale aliquid*". See also LDB 364: "*materiam primam et formam substantialem, potentias nempe passivam et activam primitivas compositi et completum ex iis resultans; revera arbitror esse illud vinculum substantiale quod urgeo*. Although less straightforward, this passage says that the *vinculum substantiale* is a complete thing (*completum*) comprising prime matter and a substantial form.

But contrary to monads, the substantial bond somehow depends on them. To define the appropriate dependence of the vinculum on the monads, Leibniz uses the notion of a requisite. In general, a requisite is defined as a necessary condition that is naturally prior (*natura prius*) to that which requires it. Leibniz recognizes two kinds of requisites: mediate and immediate.⁵⁹ The defining feature of a mediate requisite is that it must be investigated by reason and does not depend on purely logical relations of entailment. Causes are paradigm cases of mediate requisites. By contrast, immediate requisites rest on such purely logical relations. Parts are immediate requisites of wholes. A part is defined as an immediate requisite that is homogeneous with a whole (in this sense, line segments but not points, are parts of the line, smaller volumes are parts of volumes, but not surfaces, etc.).⁶⁰ Leibniz here distinguishes two kinds of requisites: metaphysical and natural. He maintains that the vinculum naturally requires monads but denies that the latter are metaphysically required by the former. This contrasts sharply with monadic aggregates, which metaphysically require a fixed set of monads, as he explains in this passage:

Thus as you say, when the complete substance realizing the phenomena is posited, the substance of the composite is had immediately; but it is not posited by God, acting in a regular manner, unless the ingredients exist, namely monads or other partial composite

⁵⁹ A VI.4A.627/LOC 271: “Some requisites of things are mediate and must be investigated by reason, such as causes; others are immediate, such as parts, extremes, and generally whatever is contained in things. If, when several things are posited, by that very fact some unity is immediately understood to be posited, then the former are called parts, the latter a whole”.

⁶⁰ A VI.4A.872: *Pars est componens homogeneum composito nempe toti*. Leibniz distinguishes the relation of inherence from the mereological parthood relation: the point is in the line, but neither as a part in a whole nor as an accident in a subject.

substances. Yet these ingredients are not formally in the substance; they are required, but they are not demanded by necessity. And so they can be absent as the result of a miracle, which is to say that these ingredients are not formally constituents. They are constituents in aggregates, not in true substances. (Leibniz to Des Bosses, 29 May 1716, LDB 373)

It is metaphysically impossible for an aggregate to exist without its constituent monads. Using our prior distinction, we can say that an aggregate rigidly depends on its constituents (LDB 369). Conversely, the simultaneous existence of the parts of an aggregate is a sufficient condition of the aggregate's existence (LDB 321).⁶¹ In this passage Leibniz talks of the concept of constituent. According to its usual definition, it coincides with the concept of an immediate requisite and of "existing in" (*inexistens*) or "being contained" (*contentum*).⁶² Correspondingly, Leibniz speaks in the letter to Des Bosses of the monads as ingredients (*ingredientia*) and of "being formally" in something. The main point is the contrast between an aggregate and a substance: monads are ingredients or constituents of an aggregate and they are thus formally in this aggregate, insofar as they jointly logically entail the existence of the aggregate, and conversely this aggregate rigidly depends on these constituting monads. By contrast, the substantial bond is logically or metaphysically independent of the monads.

⁶¹ See also A VI.4A.627. The simultaneous existence condition entails that an aggregate is more than a mereological sum.

⁶² See A VI.4A.1002: *Si pluribus positus, A, B, C, eo ipso positum sit unum, aliquod L sine ulla illatione, dicuntur illa constituenta, hoc constitutum; illa contenta, hoc continens, seu illa inexistencia isti. Et hoc est quod diximus A esse requisitum immediatum ipsius L. Quod si constituenta sint res inter se diversae A, B, etc., dicuntur partes et L totum.* See also A VI.4B.1673.

Metaphysical independence is indeed required by Leibniz's account of transubstantiation. However, he maintains that each vinculum naturally requires at least some monads. Animal bodies undergo a constant change of their constituting monads. Moreover, the vinculum naturally requires a determinate dominant monad.⁶³ Thus any vinculum naturally requires a determinate monad corresponding to the soul of the composite substance and the variable set of monads corresponding to the composite's body.

Leibniz's later account differs from his earlier by a second feature. The former view relied on an additive account of the matter and form of the composite substance: its entelechy is just the sum of its monads primitive active forces, and its primitive passive force is just the sum of its monads' primitive passive forces. In the later stage of the correspondence, by contrast, the composite substance possesses its own primitive (active and passive) forces:

Composite substance does not consist formally in monads and their subordination, for then it would be a mere aggregate, that is, an accidental being; rather, it consists in primitive active and passive force, from which arise the qualities and the actions and passions of the composite. (Leibniz to Des Bosses, 29 May 1716, LDB 371)

Earlier, Leibniz had told Des Bosses that the vinculum is a genuine principle of action (LDB 349). While this raises many questions, I will only consider how the vinculum relates to the composite substance, on the one hand, and to its forces, on the other hand.⁶⁴

⁶³ In one passage, Leibniz describes the relation as one where the vinculum "adheres" to the dominant monad in a composite substance (LDB 337; see also LDB 321 "naturally attached" and LDB 375 it "naturally accompanies its dominant monad"). Adherence is meant to describe a kind of dependence without inherence.

⁶⁴ There are two other important questions that I cannot deal with here: (1) What is the relation between the primitive forces of the composite substance and the primitive forces of

In the passage quoted above, Leibniz seems to identify the substantial bond with the primitive and active forces of the composite. However, the vinculum must be distinguished both from the whole composite substance and from its primitive active and passive forces, as appears more clearly in another passage from the same letter:

I do not say that there is a mediating bond between form and matter but, rather, that the substantial form itself of the composite and primary matter taken in the scholastics sense, that is, primitive active and passive power, belong (*inesse*) to the essence of the composite so to speak, in virtue of this bond. (Leibniz to Des Bosses, 29 May 1716, LDB 367; transl. modified)⁶⁵

This passage distinguishes clearly the essence of the composite, constituted by the matter and form, i.e. primitive active and passive forces, on the one hand, from the vinculum, on the other hand. It adds that the vinculum is not a relation between matter and form, but that in virtue of which this matter and this form constitute the composite substance's essence. A few lines earlier, Leibniz says "it will be the foundation for a composite substance" (LDB 367; *revera enim substantiae compositae basis erit*, LDB 366). The term "basis" (in French *base*) is rather uncommon in Leibniz. He uses it in the *Monadology* (§48). In a text from the same period, he distinguishes the notions of a complete substance from that of a *sujet précis et incomplet* (GP VI.582). The latter is synonymous with the notion of *basis* and designates

the monads in the new account? (2) How does the vinculum achieve the unification of the primitive active and passive forces? They are closely studied in Look, 'On Substance and Relations'.

⁶⁵ The translation in Look and Rutherford is misleading here, as it makes the text say that matter and form belong to the bond, thus equating this bond with the essence of the composite substance.

the metaphysical ingredient in virtue of which a composite substance is a metaphysical subject, considered in abstraction from its entelechy and primary matter, which are its essence. Leibniz also uses the notion of *suppositum* or *suppôt* in particular when he describes the metaphysical union of mind and body.⁶⁶ This use is close to the scholastic notion of a *suppositum* as an individually existing metaphysical subject, which, together with the matter and form, makes up one individual composite substance.⁶⁷ In the *Theodicy* the term *suppôt* merely denotes the composite substance, without explaining its real unity. By contrast, in the letters to Des Bosses, the vinculum understood as the basis of the composite substance is a real subject of the primitive forces. This departs from the scholastic views. For instance, Suárez holds that the unity of the composite substance as a *suppositum* presupposes the unity of its essence.⁶⁸ In other words, it is because matter and form are naturally disposed to constitute a complete essence that a composite substance is a *suppositum* capable of

⁶⁶ *Theodicy*, Preliminary Discourse §55-56, G VI, 81; part I, §59, G VI, 135; see Look, ‘Leibniz and the ‘Vinculum Substantiale’’, 60-63.

⁶⁷ Aquinas, *ST* I, q.3, a.3; III, q.16, a.5; Ockham, *Quodlibet* IV, q.7, OT IX, 328. See Suárez, *DM* XXXIV.1.9: *omnis prima substantia creata incommunicabilis est; omnis ergo prima substantia creata est suppositum. Et e contrario, etiam omne suppositum creatum est prima substantia; nam est substantia completa singularis ac per se subsistens*. For the theological, especially Christological, origins and medieval development of the notion of *suppositum*, see Adams, ‘Aristotelian Substance and Supposits’, *Proceedings of the Aristotelian Society*, Supplementary Volumes, 79 (2005), pp. 15-52, and Ward, *Parts and Wholes*, ch.7.

⁶⁸ *DM* XXXVI.2.7: *Sicut essentia prior est subsistentia, ita unio in entitatibus essentiae prior esse debet quam unio in partialibus subsistentiis [...]. Est ergo substantia materialis per se una non tantum ratione unius suppositi, sed etiam ratione unius essentiae*.

subsisting by itself, not the other way round. While this holds in the natural course of things, Suárez admits one exception in the case of Christ's hypostatic union, where a single *suppositum* comprises two essences, the human and divine natures.⁶⁹ Leibniz thus makes a rule of what was considered by the scholastics as an exception, namely, hypostatic union.

7. Conclusion

I have thus tried to establish that Leibniz shifts from an account with strongly reductionist aspects to a view that is similar to the antireductionism of Scotus. This final account of the *vinculum* is not free from internal difficulties. On the one hand, it is that which bundles together a plurality of monads, while on the other hand, it denotes the composite substance itself insofar as it is something over and above the monads. The final identification of the *vinculum* with a *suppositum* partially explains how Leibniz was led to confuse these two distinct roles. For the monad's individual forces are unified when there is a single subject of the composite's entelechy and prime matter. This tells us only when the unification occurs, but leaves how it occurs unexplained.

But now, one may ask whether the *vinculum substantiale* really denotes a composite substance. On Look and Rutherford's interpretation, Leibniz's last words about the *vinculum* "render his theory of corporeal substance a version of the Unity View, according to which a corporeal substance is properly conceived not as a composite, but as a unity of primitive active and passive powers, neither of which exists independently of the substance itself" (LDB lxx)⁷⁰. Prima facie this reading is supported by the fact that in the later stage of the

⁶⁹ *DM XXXIV.2.5*; 4.28.

⁷⁰ In a similar vein, D. Garber concludes that "the substantial bond now looks like the corporeal substance of the middle years resurrected, and beginning to shove the monads aside:

correspondence, the corporeal substance is an independent entity, endowed with its own essence, which may thus appear to be a basic particular.

However, I think that there is a complication and that this interpretation goes too far: in the later account of the vinculum, Leibniz is indeed a non-reductionist, that is, the composite substance is endowed with a proper essence and its own *per se* unity. But on the interpretation I have proposed, the composite substance is a certain structure defined by its entelechy and primary matter, and this structure is variously related to monads. On the one hand, it is non-rigidly dependent on a single monad, which embodies the formal component of the composite. On the other hand, it is generically dependent on the existence of a plurality of monads, i.e., it is related at various times to distinct groups of monads, which are at those times subordinated to the dominant monad and correspond to its primitive passive force.

one can legitimately wonder what work they are now really doing in the theory” (*Leibniz. Body, Substance, Monad*, 379).