

Introduction

The logic of the part-whole relation was first given the name ‘Mereology’ by Leśniewski, which he considered to be part of a larger, nominalist system that he dubbed ‘Ontology’. Leśniewski’s Mereology, which is essentially the same as the ‘Calculus of Individuals’ developed by Leonard and Goodman, is now considered to be only one of a family of formal systems that attempt to pinpoint the precise logical nature of the part-whole relation (as well as related notions, such as ‘overlap’, ‘underlap’, ‘disjointness’, and so forth)¹. These formal systems are themselves contained under a larger family of systems that characterize what are called ‘partial ordering’ relations.

It has been observed by Cotnoir and Varzi that the first, complete formal systems of the part-whole relation did not occur until the twentieth century and that, before this, few (if any) philosophers systematically studied the part-whole relation formally and in isolation². Based on what we currently know, there is no evidence to contradict their claim. However, this does not mean that there were no periods of intensive interest in the part-whole relation as it applied to this or that issue. Medieval philosophers, in particular, generated an enormous body of literature on parts and wholes as these concepts applied to various issues in logic, physics, psychology, and metaphysics³. Thus, if

¹ For a history and systematic presentation of Classical Extensional Mereology (viz. the system developed by Leśniewski/Leonard and Goodman) and alternative formal systems, see SIMONS 1987, especially part I, chapter 2; VARZI 2016; and soon, COTNOIR, VARZI forthcoming.

² COTNOIR, VARZI forthcoming, ch. 1, sects. 1.1-2; see also *Introduction* to VARZI 2016.

³ This list is not intended to be exhaustive. Reflections on parts and wholes probably appear in other domains as well, for instance, politics. As Laurent Cesalli notes at the end of his contribution, some of Wyclif’s fascinating theses about collections might have been motivated by political concerns, and it is well known that Aristotle casts the structure of the state in terms of wholes and parts (see *Pol.* 1.2).

we are allowed to appropriate the term ‘mereology’ and apply it more broadly to any philosophical study of parts and wholes, we can safely say that medieval philosophers had much of interest to say about mereology.

For a long time, interest in mereology among contemporary scholars of medieval philosophy was sporadic. There were, of course, the foundational studies by Desmond Paul Henry, to which any serious student of the subject still ought to pay close heed, but not much else on mereology as a proper subject of inquiry⁴. However, in recent years, there has been an explosion of interest in medieval mereology. This volume, which is based on a conference devoted to medieval perspectives on the logic and metaphysics of parts and wholes (held in Pisa, July 2016), is one of many exciting contributions now in print or shortly forthcoming.

In what follows, I aim to provide some context for the more detailed and specialized studies included in this volume.

1. *Types of parts*

In medieval mereological discussions, the typical division of wholes and parts is fourfold:

- 1) The universal into its *subjective* parts
- 2) The integral whole into its *quantitative* parts
- 3) The essential whole (typically, a substance) into its *essential* parts (typically, its substantial form and prime matter)
- 4) The power whole (*totum potestativum/virtuale*) into its *power* parts (*potentiae/virtus*)⁵.

Of course, variations to this list can be found throughout the medi-

⁴ I don’t mean to suggest that there were not important studies of subjects that bear upon the part-whole relation. Of those, there are too many to mention. I only mean to say that the study of medieval mereology *as such* has until rather recently been neglected.

⁵ Here I follow the preferred English rendering of this technical notion in PERLER 2015. ‘Virtual whole’ or ‘potential whole’ and especially ‘virtual part’/‘potential part’ suggest another notion, namely, that the parts exist virtually, or *in potentia*, in the whole, that is, in a manner that is less than fully actual. In the medieval tradition, the elements are often said to exist in a material particular neither actually and nor in pure potency, but rather in some intermediate sense, namely, virtually.

eval literature on parts and wholes. In eleventh- and twelfth-century discussions, the division is often threefold, consisting of (1), (2), and (4)⁶. This not only invites the conclusion that the substantial form and the prime matter of a material particular are integral parts, it also might lead one to even more radical claims, such as that there is no distinction between a change in quantity and a change in substance⁷. More remarkably, perhaps, a few medieval thinkers even entertained the notion that the universal whole is merely a kind of integral whole⁸. Others in the tradition, such as Radulphus Brito (see Sten Ebbesen and Costantino Marmo's contribution, section 3), did not *reduce* wholes of type (1) to another type; rather they *excluded* universals altogether from their typology of wholes and parts, either (as perhaps Radulphus himself does) because universals were not relevant to the discussion in which a typology is introduced⁹, or because they denied that universals were strictly speaking wholes. On this stronger reason for omitting the universal whole, see section 2 below. In the main, however, medieval thinkers insisted that these divisions were not only exhaustive, but that they divided wholes into discrete – that is, irreducibly distinct – kinds of wholes¹⁰.

We will follow this fourfold division in the introductory remarks that follow, but before we do, it is worth mentioning in passing two other common distinctions that pertain to the whole. The first is found in the literature on the topics (*loci*)¹¹.

⁶ See, e.g., *Compendium Logicae Porretanum* III.12, edd. Ebbesen, Fredbor, Nielsen, p. 38.

⁷ See Wojciech Wciórka's contribution to this volume. This collapse of the integral and the essential also is at least mooted in later discussions among so-called Nominalist philosophers. See Alfred van der Helm's contribution. Buridan, for instance, seems to think that a change in matter not only entails a change of quantity, it also entails (strictly speaking) a change in substance, at least for plants and animals. On this point, see below, section 4.

⁸ See the contribution by Caterina Tarlazzi, also well as that by Roberto Pinzani, although universals are not the primary focus of his notes on the remarkable twelfth-century treatise(s) that have come down to us as *De generibus et speciebus*.

⁹ This is what Sten Ebbesen and Costantino Marmo suggest in their contribution.

¹⁰ See ARLIG 2011b.

¹¹ See, e.g., RADULPHUS BRITO, *Quaestiones super De differentiis topicis Boethii* II, qq. 9-12, ed. in GREEN-PEDERSEN, PINBORG 1978, pp. 44-53; PETER OF SPAIN, *Tractatus (Summulae logicales)* V, 11-18, Engl. trans., pp. 210-9; LAMBERT OF AUXERRE,

- (1) The universal whole
- (2) The integral whole
- (3) The whole in quantity
- (4) The whole *in modo*
- (5) The whole in place
- (6) The whole in time.

Divided this way, logicians then proceed to discuss the topical maxims that apply to these wholes and their corresponding parts. None of the authors in this volume attempt to discern what the precise relationships might be between this division of the whole and the former division, although many of the philosophers studied (including Albert of Saxony and Radulphus Brito) present both lists in their surviving works¹². This is one of many possible future areas of study in the field of medieval mereology.

The second distinction worth mentioning in passing is that between the syncategorematic and the categorematic senses of ‘whole’. This distinction is starting to appear as early as the twelfth century¹³, but it becomes commonplace in thirteenth- and fourteenth-century logical texts, especially, in the *sophismata* literature, where it is marshalled in order to disambiguate such sentences as ‘Whole Socrates is part of Socrates’ (*Totum Sortes est pars Sortis*).

2. *Universals as wholes*

Medieval philosophers inherit from antiquity the idea that universals either have mereological structure or at least something akin to mereological structure¹⁴. Here, for instance, is Porphyry:

Logica, ed. Alessio, pp. 126-7, and JOHN BURIDAN, *Summulae de dialectica* VI, 4, 2-8, Engl. trans., pp. 421-39, to list only a few.

¹² See the contribution by Harald Berger to this volume, and that by Sten Ebbesen and Costantino Marmo.

¹³ In particular, see Desmond Henry’s remarks on Abelard’s appreciation of the ‘quantificational’ or syncategorematic nature of the term *totum*. See HENRY 1991, pp. 67-70.

¹⁴ Indeed, the most widely used Greek term for ‘universal’ is *katholou*, which is a composite of *kata* (with respect to) and *holon* (whole). This etymological connection is preserved in the Arabic tradition: *kull* (whole)/*kulli* (universal). See, e.g., AVICENNA, *Kitab al-Shifa* V, 2, 10, Engl. trans., pp. 161-2.

Thus, the individual is contained under the species, and the species under the genus. For the genus is a sort of whole (*holon ti*), and the individual a part. But the species is both a whole and a part; it is part of the former [viz. the genus], and a whole, not of the latter [viz. the individual], but in latter ones [viz. individuals]. For it is a whole in parts¹⁵.

Boethius not only reinforces this suggestion in his commentaries on the *Isagoge*, he goes one step further by explicitly stating in his *On Division* that the universal, considered in relation to its particulars, is one of the true wholes:

We call that which is not continuous a whole, as for example, a whole flock, a whole populace, or a whole army. We also call what is universal, such as human or horse, a whole. For they are wholes of their parts, that is, of humans and horses. And for this reason, we call each and every human a particular¹⁶.

Indeed, as the text from Porphyry indicates, universals exhibit not one, but *two* mereological (or quasi-mereological) structures. The first is a partial ordering relation that obtains between a universal and the items that it contains or encompasses. This is the partial ordering relation that Boethius is alluding to when he claims that that universal is a whole whose parts are the individuals that are contained by it. But there is a second mereological structure that universals other than the highest genera possess. This is the internal structure that is indicated by the *definition* that belongs to or characterizes a certain species (e.g. human is *a rational, mortal animal*).

Strictly speaking, genera and species, along with *differentiae*, *propria*, and accidents, are ‘predicables’, that is, items that are predicable of many¹⁷. It is an open and hotly disputed question in the Middle

¹⁵ PORPHYRY, *Isagoge* 3, §16, trad. par de Libera, Segonds, p. 9 (= ed. Busse, pp. 7,27-8,3).

¹⁶ BOETHIUS, *De divisione liber* 887d, ed. Magee, p. 38,20-4. On this passage, see Roberto Pinzani’s contribution to this volume. By ‘true whole’, I mean one of the many things divided *secundum se* that are not covered under the other two *secundum se* divisions, namely, the division of a genus into its species and the division of a word into its significations.

¹⁷ This definition of a predicable is essential for understanding why, for instance, Thomas Manlevelt queries whether ‘this human’ is a predicable. See Alfred van der Helm’s contribution for details.

Ages as to what precisely it is that is predicated of anything else. For instance, as Paul Thom notes in his contribution, Avicenna's view is that predicables are intensions, which is a view that a number of philosophers accept. These intensional objects need not correspond isomorphically to concrete things in the actual world. Nonetheless, as Thom goes on to show, Avicenna thinks that some of these intensions, namely, *quiddities* exhibit mereological structure.

Avicenna's view would be at home with a number of contemporary proponents of mereology. Indeed, it is often claimed that a formal mereological system is ontologically neutral, or 'innocent':

Not just any controversial thesis that uses mereological notions and wins the adherence of some mereologists is a thesis of mereology *per se*. (1) Mereology is silent about whether all things are spatiotemporal. (2) It is silent about whether spatiotemporal things may have parts that occupy no less of a region than the whole does [...] (3) Mereology is silent about whether something wholly present in one region may also be wholly present in another. For better or worse it does not forbid recurrent universals, or enduring things wholly present at different times, or a singleton atom that is where its extended member is by being a every point of an extended region, or the undivided omnipresence of God. (4) Finally, if something occupies a region, mereology *per se* does not demand that each part of the occupied region must be occupied by some part – proper or improper – of the occupying thing¹⁸.

Unlike Lewis and many other contemporary mereologists, medieval thinkers never seemed to think that a logic of parts and wholes could be completely abstracted from the kinds of things under consideration and, therefore, 'neutral' with respect to ontology. Perhaps it was the fact that genera and species were intensions and not concrete things that prompted Avicenna's commentator to claim that predicables had mereological structure only in a figurative sense¹⁹. Tusi's suspicion is echoed by many in the Latin tradition. Here, for instance, is Ockham, commenting on that passage from Porphyry quoted above:

Here it should be understood that the individual is not properly a part of the species, nor is a species properly a part of a genus. Nor is the converse true²⁰.

¹⁸ LEWIS 1991, p. 76.

¹⁹ See Paul Thom's contribution, Text 12a.

²⁰ That is, nor is it the case that the genus is a part of the species or that the species is