Kathrin Koslicki, *The Structure of Objects*, Oxford University Press, 2008, 288 + xix pages. Hardback $90.00.

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In her book *The Structure of Objects* Kathrin Koslicki develops and defends a neo-Aristotelian theory of objects, according to which objects are structured wholes that exist only if their parts are adequately unified and exhibit the right kind of structure.

In chapters 1-3 Koslicki outlines classical extensional mereology and criticises the widely held view that objects are to be understood as mereological sums that obey the unrestricted fusion axiom. She also puts forward a Leibniz's Law-style argument against the view that composition counts as a form of identity, showing that various ways of restricting the applicability of Leibniz's Law are suspect. Chapter 4 contains a description and critique of Kit Fine's theory of rigid and variable embodiments, the most detailed contemporary statement of a neo-Aristotelian view of composition. While Koslicki agrees with Fine's arguments against standard mereology, she criticises Fine's positive account on the basis that it leads to a proliferation of different parthood relations and commits us to an overabundance of objects. Chapters 5 and 6 are historical investigations of Plato's and Aristotle's views about parts and wholes, which have inspired Koslicki's own approach. In chapters 7-9 Koslicki sets out her positive proposal for a structure-based mereology and provides detailed discussions of natural kinds and of the notion of structure.

The key features of Koslicki's view are that (i) composition is restricted, that (ii) there is a form/matter dichotomy, that (iii) composition fails to be ontologically innocent, and that (iv) wholes are unified.

(i) RESTRICTED COMPOSITION. Koslicki holds that not every collection of objects composes a further object, but only those collections that are adequately unified and exhibit the right kind of structure. Composition only takes place when parts are related in such a way as to satisfy the conditions for composing an object of a particular kind. Which composite objects exist is accordingly fixed by what kinds there are and is consequently to be settled by considerations extraneous to mereology. Put differently, mereology does not tell us what exists, but captures commitments that have been independently established, in particular commitments that derive from scientifically informed common sense.

(ii) FORM/MATTER DICHOTOMY. Koslicki takes on board the Aristotelian idea that objects consist of form and matter, that they have both formal and material components. According to her account, an object is understood as a structured whole that exemplifies a principle of unity. For the whole to exist, it is not only required

that the parts exist but also that they be related in the right way. The parts must exhibit a certain structure, whereby this structure is taken to be literally a part of the composite object. That is, form and matter are both proper parts of an object. Koslicki argues for this view by appealing to the weak supplementation principle (a principle she takes to be constitutive of the notion of parthood), which states that if x is a proper part of y then there exists a z that is a part of y and that is disjoint from x. If the weak supplementation principle is accepted and if one also accepts the claim that an object y can be made from a single material component x, then it follows from the fact that x and y are distinct that they must differ in parts. Given that they share all the same material parts since y is made up only of x, it follows that they must differ in formal parts and that formal parts consequently classify as proper parts of an object. This view allows Koslicki to accept the uniqueness of composition and adopt an extensional mereology, according to which objects that are composed of the same parts are identical, whilst at the same time making room for coinciding objects. This is possible on her view since coinciding objects that share the same material parts and that consequently coincide, nonetheless differ in formal parts and are consequently distinct. (Koslicki assumes that it is not possible for objects of the same kind to coincide.) The distinction between formal and material parts also allows her to give an account of the constitution relation. Koslicki claims that constitution can be understood in terms of material parthood: the xx's constitute y iff the xx's are all and only all the material parts of y.

(iii) composition fails to be ontologically innocent. Koslicki rejects the composition-as-identity view, according to which wholes are nothing over and above their parts. Instead, she argues that composition is ontologically loaded, that it produces genuinely new objects and adds to our ontology. Wholes are numerically distinct from their parts and are not to be identified with them.

(iv) wholes are unified. Composite object possess unity despite being composed of a plurality of parts. Their parts are many but they are one. Koslicki argues that their unity derives from the fact that they are specimens of a kind.

While the key components of Koslicki's view are clear, many details still need to be worked out. I will briefly mention three issues concerning kind-membership where problems may arise.

First, worrisome consequences would arise if kind-membership could turn out to be a vague matter, either insofar as the conditions of belonging to kind K could be vague or insofar as it could be vague whether the conditions of belonging to kind K would be satisfied in a particular case. Such vagueness in kind-membership would imply that composition could be a vague matter, thereby leading to ontic vagueness. This potential problem is connected to the general

worry that any non-arbitrary restriction on composition will be vague. Koslicki tries to address this problem by criticising the Lewis/Sider argument from vagueness in chapter 2. It would be good if she could, in addition, provide a positive account of kinds that would preclude the possibility of these two types of vagueness in kind-membership.

Second, Koslicki appeals to kinds to impose restrictions on composition and explain the formal components of objects. Such an account is problematic unless one can motivate the view that there are principled restrictions on which structures classify as kinds. Otherwise, there is a risk of ending up with Fine's extremely liberal account that counts every possible structure as giving rise to a principle of unity, thereby leading to an over-abundance of objects. Whilst Koslicki's suggestion that structures must play a prominent role in induction, laws of nature and causal explanation in order to classify as kinds is plausible, more work needs to be done in developing a positive theory of kinds.

Third, Koslicki argues against what she calls '*relativism* concerning divisions of objects into parts', a view according to which there is no correct way of dividing an object into parts and which considers division to be simply a matter of choice. In addition to rejecting this form of relativism, Koslicki also has to argue against the possibility that, even though there are correct ways of dividing objects, there may be cases where there are multiple correct ways of dividing an object. In other words, she has to provide an account of kinds that precludes the possibility of certain forms of disjunctive kind-membership. Otherwise, there will be room for same-kind coincidence. More precisely, if an object of kind K can be composed by either satisfying condition C_1 or by satisfying condition C_2, and if both of these conditions can be satisfied at the same time, then there will be cases in which two objects of kind K will coincide. If x constitutes an object y of kind K and if parts $p_1 \ldots p_n$ of x constitute objects $w_1 \ldots w_n$, which in turn jointly constitute an object z of kind K, then y and z will be coinciding objects that fall under the same kind. For instance, if one can make a crown by taking some gold and forming it into a particular shape or by taking some crowns and putting them together in a certain way, then the pope will have two crowns that will coincide. He will have a crown (y) that is made out of the gold (x), and he will have a crown (z) that is made out of the three smaller crowns ($w_1 \ldots w_3$) that make up the tiara, which in turn are constituted by sub-portions of the gold (x), namely ($p_1 \ldots p_3$). These seem to be equally eligible ways of dividing 'the' pope's crown, whereby each of these divisions satisfies the constraint that "the parts we attribute to a particular object must themselves deserve the status of objects within our ontology" (p. 263).

The Structure of Objects is well written and does not presuppose much background knowledge, making it accessible to a broad audience and suitable for teaching undergraduates. It is an important contribution to the literature on composition that presents an interesting alternative to the standard account of objects.