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Reflective mereology. (English. English summary)

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Classical mereology is the study, initiated by Stanisław Leśniewski around 1927 and pursued by logicians like Alfred Tarski, of parts and the wholes they form.

G. Uzquiano [Philos. Stud. **129** (2006), no. 1, 137–169; MR2234999; in *Absolute generality*, 305–332, Oxford Univ. Press, Oxford, 2006; MR3618547] observed that atomistic classical mereology is in tension with set theory when both theories quantify over absolutely everything. In the aforementioned papers, Uzquiano considered different attempts to resolve this unwelcome situation, none of them, admittedly, completely satisfactory. The question of whether there can be a well-motivated mereology that sits well with set theory thus remains relevant.

In the paper under review, the author aims at solving Uzquiano's cardinality problem by proposing a new mereology based on a mereological reflection principle. This new mereology has natural fusion principles, but refutes two core principles in classical mereology: unrestricted fusion and fusion uniqueness. Significantly, it is shown that this new mereology can coexist with set theory in harmony.

In the final section, the author briefly discusses several philosophical issues related to the formal results proved therein. In particular, it is argued that reflective mereology is a theory of parthood well-motivated by independent philosophical considerations. The first novel axiom of reflective mereology can be seen as a way of articulating the metaphysical thesis that the universe of everything is indescribable, which is a natural generalization of the Cantorian conception of set. As for the second axiom, the context in which it is put forward is reminiscent of the way in which $\in$-separation has come to be used as a replacement of the naive comprehension principle in set theory in response to Russell's paradox. *Frédéric Morneau-Guérin*