

A Sketch of a Sirenia: Meros Theory

or: an elementary theory of the category of mereological sums
(including mereological wholes and parts)

(version: draft, 22. 08. 2013)

by DAN KURTH

e-mail: dankurth@web.de

Abstract. In this paper we will give a sketch of a categorically version of particular mereological structures. I.e. we will follow the example of F.W.Lawvere's "An elementary theory of the category of sets"¹ where he introduced a categorised version of set theory.

We refer to sirenians mainly for the reason that they are the closest living relatives of elephants.² But they are also rather underestimated creatures - at the first moment rather dull and clumsy, but moving gracefully and elegant in their natural habitat.

And some sailors already reckognized their bewitching attraction before we did.

Yet we still think this sirenia is a modest creature compared with the elephant in the room.³

Motivation

Categorising Mereology wouldn't seem so self suggesting as categorising set theory and that – besides the very different prominence of these two systems of logic – mainly for the reason of the very different nature of their objects.

¹ F.W.Lawvere, An elementary theory of the category of sets, Proceedings of the National Academy of Sciences, U.S.A., 52, 1506-11;

² Cf. <http://en.wikipedia.org/wiki/Sirenia>.

³ Cf. Johnstone, P. T., Sketches of an elephant : a topos theory compendium, Oxford University Press, 2002 -

Elements, i.e. members of sets and consequently sets themselves are good for everything (including the opposite of everything), i.e. they can stand for everything or any interpretation. That it is not the case for parts or mereological sums or mereological wholes. A part at least must be a part of something, some mereological sum, some mereological whole and will also consist of something, namely either other parts or mereological atoms.

Such an ontological – or better: objectological – constraint doesn't yield an unequivocal determination or interpretation of any given part or mereological sum etc. But it sets intrinsic correlations of any particular part – whole relation and it also translates the intrinsic nature of these correlations to all further extensions of the original part – whole relation.

Therefore a general categorising of mereology just seems to miss the point, namely catching the specific relations of mereological objects by bringing them into the categorical framework of objects and their respective morphisms. A general structure of the mereological objects and their respective interrelatedness is already implicated or presupposed by their mereological nature itself.

This would change immediately if the categorisation of mereology would yield more than the still relatively general structure implied in the part – whole relation as such. 'More' here means 'a more specific structure'. And here it is where a tacit ontological – or better: objectological – presupposition of mereology matters, namely that everything – including the entirety of everything – is a rather large and complex and deeply structured and layered relation of relations of relations ... of parts and wholes, where these relations themselves being mereological sums, and/or mereological wholes, and/or mereological parts.

Categorising mereology, i.e. Meros Theory, then should better be done up from the scratch, i.e. from gunk, since so it would become equipped with the required specificity which would make it non-trivial. Up from this beginning the intrinsic specificity or nature of the mereological structures would relate and translate to any of the ever more complex structures.

In my paper "*The Topos of Emergence*"

(cf http://www.academia.edu/1549400/The_Topos_of_Emergence)

I've introduced a mathematical structure **PrePhys** which is a proper model of such a required gunk.

Recently I commented on that with a particular accent laid on the fact that **PrePhys** actually is a model of the required gunk. (Cf. a draft version (of a part an unfinished paper) with the title "*Intelligible Dynamical Gunk -An Annex to "The Topos of Emergence"(version: draft)*" (cf. http://www.academia.edu/4232503/Intelligible_Gunk)

Categorising mereology, i.e. introducing Meros Theory, having gunk at hand then should not be such a challenging task, essentially it would mean one has to take the different mereological operators (of the various mereological systems) as morphisms and apply these on an appropriate ontology – or better: objectology – of mereological sums, mereological wholes and parts.

Categorifying Meroses however would be a bit more difficult.

(to be continued)