"In good company? On Hume's Principle and the assignment of numbers to infinite concepts"

In a recent article (Review of Symbolic Logic 2009), I have explored the historical, mathematical, and philosophical issues related to the new theory of numerosities. The theory of numerosities provides a context in which to assign numerosities to infinite sets of natural numbers in such a way as to preserve the part-whole principle, namely if a set A is properly included in B then the numerosity of A is strictly less than the numerosity of B. Numerosities assignments differ from the standard assignment of size provided by Cantor's cardinality assignments.

In this talk, I generalize some specific worries emerging from the theory of numerosities to a line of thought resulting in what I call a 'good company' objection to Hume's Principle (HP). The talk has four main parts. The first takes a historical look at nineteenth-century attributions of equality of numbers in terms of one-one correlations and argues that there was no agreement as to how to extend such determinations to infinite sets of objects. This leads to the second part where I show that there are countably infinite many abstraction principles that are 'good', in the sense that they share the same virtues of HP and from which we can derive the axioms of second order arithmetic. The third part connects this material to a debate on Finite Hume Principle between Heck and MacBride and states the 'good company' objection. Finally, the last part gives a tentative taxonomy of possible neo-logicist responses to the 'good company' objection
and makes a foray into the relevance of this material for the issue of cross-sortal identifications for abstractions.