The historical and conceptual place of multi-level selection within evolutionary theory

Peer-reviewed collective volume*

During the past few decades, multi-level selection has been one of the most hotly debated subjects in philosophy of biology and evolutionary theory. But, even though the subject has generated an enormous interest, this interest remains fairly ambiguous, and the notion of multi-level selection (MLS for short) itself remains controversial. Indeed, it is seen – by some researchers, at least – as important enough to help explain truly major aspects of the evolution of life on Earth (e.g. the evolution of pluricellularity, of sociality etc. – see Maynard-Smith & Szatmary 1995, Michod 1999), but at the same time it remains – for others, probably more numerous researchers – an essentially marginal or even questionable issue. One of the aims of this volume is to debunk the sources of this curious ambiguity.

To this end, two main hypotheses will serve as guides. The first hypothesis is that part of the suspicion that surrounds the notion of MLS is probably generated by the prejudice that when we speak today, for example, of selection at other levels than that of the organism, we mean more or less the same thing by it as the biologists of the beginning of the 20th century. However, given that the explanatory roles played by MLS were not the same in Darwin's work, or in the work of creators of the Modern Synthesis of evolution (Wright or Dobzhansky, for example), in the work of Wynne-Edwards on population number regulation or in the work of today's biologists working on the evolution of altruism (Sober & Wilson 1998) or on the major evolutionary transitions (Maynard-Smith & Szatmary 1995, Michod 1999), such an ahistorical look at MLS is unjustified. Providing detailed analyses of the specific epistemic roles played by MLS since Darwin could probably lift some of the distrust that the notion generates.

The second hypothesis is that a significant part of the distrust raised by the notion of MLS stems from the suspicion that this hierarchical expansion of the notion of selection may (or does) alter our general notion of "natural selection" to the point of rendering it unrecognizable or even questionable. For sure, today nobody really denies that selection may operate, for example, at the genetic level, while also operating at the level of the organism – this is, indeed, the case of selfish genetic elements that are harmful for the individual as a whole. But when we move at levels above those of the organism (groups, demes, species, clades) the consensus breaks down and suspicion creeps in. Why? Possibly because it is not certain that such higher-level entities conform to theoretical prerequisites that we may see as constitutive of the notion of natural selection. Here are a few possible concerns of this sort: Can such higher-level entities be said to form "populations" within which selection may act? Can they be said to inhabit significantly similar environments? Can we say that they – rather than the organisms that make them up – are adapted to certain features of the environment? Do such higher-level entities properly "reproduce"? And can such higher-level entities really be considered fitness-bearing entities? Our hypothesis is that part of the resistance encountered by MLS theory comes from the suspicion that affirmative answers to the above questions may force us to relax or modify our general notions of "population", "environment", "adaptation", "reproduction", "fitness" and that evolutionary theory might not be well served by such a relaxation in the meaning of its core notions. But whether this suspicion is well placed or not is something that can only be established by careful analyses of the possible alterations of these core notions that might be entailed by an endorsement of MLS theory above the organismic level – and this is precisely the second line of inquiry proposed by this volume.

Contributions on the two lines of inquiry indicated above are encouraged, but contributions that may differently approach the issue of the place of MLS theory within the larger conceptual or historical frame of evolutionary theory are also more than welcome.

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All proposals should contain a title and an abstract (up to 700 words). A separate file will contain the author's name and affiliation. The authors will be notified about the acceptance of their proposals. Accepted papers should not exceed 8000 words.

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