

## **Game Theory Limitations Summary**

### **Monopoly, the Vivarium and Game Theory: default limitations of simulation models**

*Von Neumann and Morgenstern showed that a wide range of non-zero-sum competition and optimisation scenarios may be reconstrued as zero-sum. This paradigm has had a wide influence in such fields as socio-biology, economics, management, military and political strategy and individual values. Widespread unawareness of the range of interaction perspectives serves to limit our strategic repertoire and miss crucial features of real complex systems.*

The game theory perspective is an example of one of Mary Midgley's "myths we live by," which has become overblown. The spurious application of simplistic game theoretic models by "experts" generally leads to less effective outcomes than collective norms of conventional morality. However the extent to which some interacting participants consciously operate according to relatively simple models increases the payoff for other participants to take such models into consideration – without necessarily embracing them.

Most interaction situations are computationally irreducible to a greater extent than the traditional, "three bodies" problem. Attempts to model meta-strategies mediated by emotion can provide guidance but no unequivocal "winning" strategy. The notion of a "player" is fuzzy and can almost always be reconstrued in practice. The notion of a game and optimal strategy may lose utility when set in the context of a set of "games" some of which are not fully specifiable. Likewise the "games" or interaction context is variable and considerations from network theory indicate how this may change the payoffs.

The extent to which "games" take place within an agreed context has been underemphasized and hence awareness of the scope for evolving the norms for interaction. Related to this theme is that games are pointless without either restriction of information or prior inability to calculate outcomes. When either of these limitations is addressed a more effective mode of interaction is possible.

These points are illustrated in a broad variety of scenarios.