998-34-87 **Martin Golubitsky*** (mg@uh.edu), Department of Mathematics, University of Houston, Houston, TX 77204-3008, and **Ian Stewart** (ins@maths.warwick.ac.uk), Mathematics Institute, University of Warwick, CV4 7AL Coventry, England. *Coupled Cell Systems.*

A coupled cell system is a collection of individual, but interacting, dynamical systems. Coupled cell models assume that the output from each cell is important - not just the dynamics considered as a whole. In these systems the signals from two or more cells can be compared and patterns of activity can emerge. We ask when can the cell dynamics in a subset of cells be identical (synchrony) or differ by a phase shift. In particular: How much of the qualitative dynamics observed in coupled cells is the product of network architecture and how much is related to the specific dynamics of cells and the way they are coupled?

We illustrate the ideas through a series of examples and discuss three theorems. The first theorem classifies spatio-temporal symmetries of periodic solutions; the second gives necessary and sufficient conditions for synchrony in terms of network architecture and its symmetry groupoid; and the third shows that synchronous dynamics may itself be viewed as a coupled cell system through a quotient construction. (Received February 12, 2004)