EÖRS SZATHMÁRY

Director, Parmenides Center for the Conceptual Foundations of Science in Munich and Professor in Biological Institute, Eötvös University Budapest

Eörs Szathmáry (born 1959) is a Hungarian evolutionary biologist at the Parmenides Center for the Conceptual Foundations of Science in Pullach/Munich and at the Department of Plant Taxonomy and Ecology of Eötvös Loránd University, Budapest.

His main interest is theoretical evolutionary biology and focuses on the common principles of the major steps in evolution, such as the origin of life, the emergence of cells, the origin of animal societies, and the appearance of human language. Together with his mentor, John Maynard Smith, he has published two important books which serve as the main references in the field (*The Major Transitions in Evolution*, Freeman, 1995, and *The Origins of Life*, Oxford University Press, 1999). Both books have been translated into other languages (German, French, Japanese, Spanish, Italian and Hungarian). He is a member of Academia Europaea and the Hungarian Academy of Sciences. He received the New Europe Prize by six Institutes for Advanced Study and the Hungarian Academy Award.

How can evolution learn?

The theory of evolution links random variation and selection to incremental adaptation. In a different intellectual domain, learning theory links incremental adaptation (e.g., from positive and/or negative reinforcement) to intelligent behaviour. Specifically, learning theory explains how incremental adaptation can acquire knowledge from past experience and use it to direct future behaviours toward favourable out comes. Until recently such cognitive learning seemed irrelevant to the 'uninformed' process of evolution. New results formally linking evolutionary processes to the principles of learning might provide solutions to several evolutionary puzzles – the evolution of evolvability, the evolution of ecological organisation, and evolutionary transitions in individuality. If so, the ability for evolution to learn might explain how it produces such apparently intelligent designs.