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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.

Complexity in Biology: Major Transitions from Simple Replicators to Language on the Earth (and maybe elsewhere)

We face startling complexity in contemporary ecosystems. Even a bacterial ecosystem looks formidably complex: the number of species and their interactions are perplexing. There is disturbing complexity even at the species level: although a bacterial cell harbours a few thousand genes only, the population of a bacterial species is kicking around up to 100 thousand genes, sampled from the total gene pool. Evolutionary units must show multiplication, heredity and variability. Remarkably, simple growth laws entail radically different selection consequences. Although the earth is still largely a planet of the bacteria, organismal complexity did increase in evolution in certain lineages. This increase in complexity was due a number of major transitions in how hereditary information is stored, used and transmitted. Genes and language provide unlimited hereditary and apparently entail open-ended evolutionary potential. The origin of the genetic code, the appearance of the eukaryotic cell and language are regarded as particularly difficult transitions. The former two seem to have been limited by rare genetic variation, whereas language seems to have been conditioned by a particular selective situation around *Homo erectus*. Synergistic effects are identified as a major source of complexity increase in evolution.