

1st Altenberg Workshop in Theoretical Biology 1996

THE EMERGENCE AND EVOLUTION OF ORGANIZATION

28.-30. September 1996

organized by Walter Fontana (Vienna), Gerd Müller (Vienna) and Günter Wagner (Yale)

The topic

Most theoretical descriptions of "organization" assume that the functional, logical, and structural relationships between the components of a system are already established. Yet both the construction and the evolution of these relationships remain elusive and pose a formidable challenge to formal theoretical framing. How do new units of organization come into existence? How are they maintained? How can we reason about their modification and the limits to their variation? What tools are available for their representation? Which different notions of "organization" can we distinguish?

Specific versions of such questions arise within and between disciplines like physics, chemistry, biology, and the cognitive and social sciences. Much may be gained by refracting the vague concept of "organization" through a prism that separates it into fundamental aspects. The purpose of this workshop is to produce such an intellectual prism by bringing together scholars from different disciplines, and have them present and debate their notion of "organization" as influenced by the field in which they operate.

Participants

RODNEY BROOKS: "Organization of Intelligence"

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research interests:

human intelligence, artificial intelligence, humanoid robots, microrobots, mobile robots

JAMES P. CRUTCHFIELD: "Information processing and organization"

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research interests:

information processing in dynamical systems, detection and quantification of structure in natural processes, computational mechanics

WALTER FONTANA

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research interests:

models of biological organization, concurrency, RNA folding and sequence-structure "landscapes", models of molecular evolution

KUNIHICO KANEKO: "Organization in dynamical systems"

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coupled map lattices, nonlinear dynamical systems, modelling of biological systems, development

CRIS MOORE: "Computation and organization"

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research interests:

computational complexity, analog computation, dynamical systems, language recognition, glassy systems, slow relaxation

HAROLD J. MOROWITZ: "Biochemical organization"

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evolution of metabolism, origin of life, early life, biochemistry

GERD B. MÜLLER: "Morphological organization"

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STUART NEWMAN: "Organization of developmental systems"

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physical factors in development and evolution, generic tissue properties

JOHN PADGETT: "Organization of social networks"

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research interests:
organization theory, social networks, political parties budgetary decision-making and politics,
stochastic process models of organizations, plea bargaining in criminal courts, Renaissance florentine
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RUPERT RIEDL

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STEPHEN STEARNS: "Life history organization"

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life history evolution, population dynamics, population genetics, community ecology, behavior

LUC STEELS: "Origin of language"

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human intelligence, behavior-oriented artificial intelligence, autonomous robots, adaptive behavior

GÜNTER P. WAGNER: "Genomic organization"

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quantitative genetic theory, mathematical population genetics, morphological theory

WILLIAM C. WIMSATT: "Theories of biological organization"

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evolutionary biology, conceptual foundations of science, complexity, biological organization.
