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28 **Lecture Notes in Morphogenesis** is an interdisciplinary book series which aims to  
29 face the questions of emergence, individuation and becoming of forms from several  
30 different points of view: those of pure and applied mathematics, of computational  
31 algorithms, of biology, of neurophysiology, of cognitive and social structures. The  
32 set of questions above concerns all the manifestations of Being, all the manifesta-  
33 tions of Life. At the heart of contemporary embryogenesis lies an essential question:  
34 How can form emerge from the constant, chaotic flow? How can a sequence of purely  
35 informational elements — an a-signifying combination of chemical substances orga-  
36 nized in the DNA molecule — evolve into the highly complex and structured forms  
37 of the living organism? A similar question can be asked when we deal with the  
38 morphogenesis of vision in neural systems and with the creation of evolving synthetic  
39 images, since digital technology makes possible the simulation of emergent processes  
40 both of living bodies and of visual forms. Finally the very idea that abstract struc-  
41 tures of meaning could be captured in terms of morphodynamic evolution opens  
42 the door to new models of semiolinguistics, semiotic morphodynamics, and cogni-  
43 tive grammars. An entire heritage of ideas and concepts has to be reconsidered in  
44 order to face new and challenging problems: the theoretical framework opened by  
45 Goethe with the introduction of the word “Morphogenesis” is developed by D’Arcy  
46 Thompson in “On Growth and Form”, it is reorganized with new theoretical insights  
47 by the classical structuralism of Levi-Strauss and formalized by the dynamical struc-  
48 turalism of René Thom. The introduction of the post-structuralists ideas of individ-  
49 uation (in Gilbert Simondon and Gilles Deleuze) and plasticity of structures builds a  
50 bridge to contemporary problems of morphogenesis at a physical, biological, social  
51 and transindividual level. The objective of this book series is to provide suitable  
52 theoretical and practical tools for describing evolutionary phenomena at the level  
53 of Free boundary problems in Mathematics, Embryogenesis, Image Evolution in  
54 Visual Perception, Visual Models of Morphogenesis, Neuromathematics, Autonomy  
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60 Wolfgang Wildgen

61 Morphogenesis of Symbolic  
62 Forms: Meaning in Music,  
63 Art, Religion, and Language



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*In memory of René Thom (1923–2002) to the  
centenary of his birth  
To my grandson Ludwig Vito Wildgen, born  
on the 29th of September 2021*

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1 **Preface**

2 The central aim of this research is to give a morphogenetic, dynamic view of human  
 3 communication, culture, and symbolic media. The underlying theoretical innovation  
 4 originated in the work of René Thom (1923–2002) and Hermann Haken (1927–).  
 5 The philosophical background refers to the *Philosophy of Symbolic Forms* by Ernst  
 6 Cassirer (1874–1945). His focus was on language, myth, and science.

7 In the present book, the starting line is defined by a morphogenetic perspective,  
 8 mainly on human communication and culture's evolution and further development.  
 9 A second and significant focus is on visual communication, music, and religion  
 10 (myth), i.e., on the “symbolic forms” (Cassirer) beyond language. The term “mor-  
 11 phogenesis” has more precisely the meaning given by René Thom (1923–2002) in  
 12 his publications on “Morphogenesis and Structural Stability” (1972) and “Semio-  
 13 physics” (1988). Finally, the applications of Synergetics in the Humanities (cf. Haken  
 14 and Stadler 1985, Kelso 1995, and Haken 1996) and the notions of “self-organization”  
 15 and cooperation or rivalry between subsystems enlarge the scope of our analysis.

16 Visual art from the Paleolithic to modernity may stand for visual communica-  
 17 tion. The present book focuses on studies of classical painting and sculpture (e.g.,  
 18 Leonardo da Vinci, William Turner, and Henry Moore) and modern art (e.g., the  
 19 sculptures of William Moore and Joseph Beuys and the paintings of Jackson Pollock).  
 20 Musical morphogenesis embraces classical music (from J. S. Bach to Arnold Schön-  
 21 berg), songs, and political songwriting. In the case of religion, the myths of pre-  
 22 literary and pre-industrial societies show essential gradients of self-organization,  
 23 mainly in the re-assembly of traditions. Classical polytheistic and monotheistic  
 24 religions also demonstrate language and logic's effect as guiding symbolic forms.  
 25 Finally, significant trends can be analyzed in the case of Christianity.

26 The book summarizes results by the author in these fields, more specifically in  
 27 his trilogy published in German: (titles of these books translated into English) 2013,  
 28 “Visual Semiotics. The Unfolding of the Visible. From Cave Art to Modern Towns”,  
 29 1918, “Musical Semiotics. Musical Signs, Cognition, and Language”; 2021 “Myth  
 30 and Religion. Semiotics of the Transcendent”.

31 Some representative analyses are developed further and exemplify the use and  
 32 the scientific relevance of the morphogenetic paradigm issued by René Thom and  
 33 Hermann Haken. A new cultural and symbolic philosophy concept emerges going  
 34 beyond Peirce and Cassirer and based on principles developed in the natural sciences.

35 Bremen, Germany

Wolfgang Wildgen

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 37 Dr. Martina Plümacher (Humbolt University, Berlin) and Dr. Ian Versteegen (University of Pennsyl-  
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