GUEST-EDITED BY
MICHAEL WEINSTOCK

SYSTEM CITY
INFRASTRUCTURE AND THE SPACE OF FLOWS

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IN THIS ISSUE

ARCHITECTURAL DESIGN

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SYSTEM CITY: INFRASTRUCTURE AND THE SPACE OF FLOWS

5 EDITORIAL
Helen Castle

6 ABOUT THE GUEST-EDITOR
Michael Weinstock

8 SPOTLIGHT
Visual highlights of the issue

14 INTRODUCTION
System City: Infrastructure and the Space of Flows
Michael Weinstock

24 Variation and Distribution:
Forest Patterns as a Model for Urban Morphologies
Evan Greenberg and George Jeronimidis

32 A History of Territories, Movements and Borders:
Politics of Inhabitation
Marina Lathouri

38 A Distributed Ground: The Unknown Fields Division
Liam Young and Kate Davies

46 Third Natures: Incubators of Public Space
Cristina Díaz Moreno and Efrén García Grinda

56 Intelligent Cities and the Taxonomy of Cognitive Scales
Michael Weinstock with Mehran Gharleghi
The city is critical to the capacity of society to adapt to a future of uncertainty and change.
— Michael Weinstock
The 'system city' represents a whole-scale rethink of the urban. In recent years, the reach and influence of large-scale cities has tended to be traced on socioeconomic grounds as reflected by Saskia Sassen's coining of the 'global city', or in terms of demographics with the 'megacity' label being applied to cities with over 10 million inhabitants. In this issue of , Guest-Editor Michael Weinstock places the urban on a much wider canvas – whether at the evolutionary, cultural or global scale. He pushes at the envelope of the current notion of the city, where the city's relationship to the global is largely regarded in terms of 'connectivity' to the Internet or worldwide trade. Weinstock's concept advances to an entirely new holistic level: 'Considering the city as a dynamic complex system places emphasis on the interactions and connectivity of the flows through its infrastructures, and of the feedbacks and critical thresholds that drive the emergence of new spaces and urban morphologies that are animated by new modalities of culture' (see p 17). He brings a scientific lens informed by his work on 'emergence' at the Architectural Association (AA) School of Architecture in London, where he is a co-founder and co-director of the Emergent Technologies and Design (EmTech) Masters programme. As part of this project he co-guest-edited, with Michael Hensel and Achim Menges, the seminal issues Emergence: Morphogenetic Design Strategies (May/June 2004) and Techniques and Technologies in Morphogenetic Design (March/April 2006). This work was consolidated in his classic book , which in many ways provides a foundation and a preface to this current issue of , with two chapters at the end of the book dedicated to the formation and emergence of cities in the ancient world.

The greatest synergies in this issue come through this focus on the material and physical sciences: whether it is SOM providing a pertinent analogy with the routine blood test and the diagnosis and intervention of the medical practitioner (see pp 86–93); Evan Greenberg and George Jeronimidis analysing the rainforest's morphology and its potential as an urban model (pp 24–31); or Groundlab on the significance of the terrain and an approach that uses ecological infrastructure as the basis for design (pp 78–85). It is also very much apparent how new technologies such as computational simulation and multi-scale analytic modelling are facilitating this approach, revealing a new sense of the city as one that is integrated into a complex network of flows and processes, and as much about physical as cultural properties.

Running counter to the main theme of the issue is Colin Fournier's energetic Counterpoint that seeks us to question any assumptions about complexity and its relationship to urban social behaviour and the system city analogy. Just how system-oriented do we want our developing perceptions of the city to be?

Notes
Michael Weinstock, ‘Metabolism and Morphology’, AD Versatility and Vicissitude, March/April 2008
above: In this article, Weinstock sets out an account of the dynamics of natural metabolic systems that are amenable to analysis and digital simulation, suggesting an agenda for the development of metabolic morphologies of buildings and cities.

Michael Hensel, Achim Menges and Michael Weinstock, AD Emergence: Morphogenetic Design Strategies, May/June 2004
top left: Guest-edited by Michael Weinstock with Michael Hensel and Achim Menges, the issue explored evolutionary design processes for the composition of materials and building systems within the context of biomimetics, digital technology and the complexity of natural systems.

top right: In his book (published by John Wiley & Sons Ltd), Weinstock places the evolution of human form, culture and cities in the context of the processes and forms of the natural world, and shows how humans have extensively modified the surface of the earth, the ecological systems that exist upon it, and the climate.
Michael Weinstock is an architect, and currently Director of Research and Development, and Director of the Emergent Technologies and Design (EmTech) programme in the Graduate School of the Architectural Association (AA) School of Architecture in London. Born in Germany, he lived as a child in the Far East and then West Africa, and attended an English public school. He ran away to sea at the age of 17 after reading Conrad. After many years at sea, in traditional wooden sailing ships where he gained shipyard and shipbuilding experience, he studied architecture at the AA and has taught at its School of Architecture since 1989 in a range of positions from workshop tutor to Intermediate and then Diploma Unit Master, Master of Technical Studies and Academic Head.

Over the last decade his published work has arisen from research into the dynamics, forms and energy transactions of natural systems, and the application of the mathematics and processes of emergence to cities, groups of buildings within cities, and individual buildings. While his principal research and teaching has been conducted at the AA, he has published and lectured widely, and taught seminar courses, studios and workshops on these topics at many other schools of architecture in Europe and the US. He has made a significant contribution to the theoretical discourses of architecture, to the pedagogies of the discipline, and on practice. He has been a leader in bringing awareness and understanding of natural systems and the historical and current impacts of complexity, climatic and ecological changes on human architectures at all scales, and of the natural and human dynamics that are currently driving changes in all the systems of nature and civilisation.

He is the author of the book *The Architecture of Emergence: The Evolution of Form in Nature and Civilisation* (John Wiley & Sons, 2010), and over the years has contributed many articles to ∆. He also guest-edited (with Michael Hensel and Achim Menges) two previous issues of ∆: *Emergence: Morphogenetic Design Strategies* (May/June 2004) and *Techniques and Technologies in Morphogenetic Design* (March/April 2006). ∆
The Magic Mountain, Ames, Iowa, 2002
A former power station is wrapped in an ecosystem mask that converts energy infrastructures and architecture into a living system to be inserted within the city. The membrane attracts the most important butterfly and bird species in the northern US like a real mountain, and the building is converted into the laboratory of a genetic engineer, where different species and varieties of roses can be researched and developed, challenging the common tools and concepts of architecture, gardening, species breeding and the ecology of living.
The Big Mech and Co: Gran Via Toxic, Madrid, 2008–10

This social engineering of a clinical order can be read as a brutal example of the ‘creative destruction’ concept developed by the economist Joseph Alois Schumpeter in his book *Capitalism, Socialism and Democracy* (1942). According to his thesis, modernity is an eminently creative destructive process supported by a constant succession of innovations. Drawing by Ja Ja Ja.
XRL West Kowloon Terminus, Hong Kong, due for completion 2014

The new terminus of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) is based on parkland that stretches over the roof of the station, creating an informal set of connections as well as a holding space for waiting, lingering and social interaction.
Public spaces are determined by pedestrian and cycle paths that are embedded in the communal usages and allow the emergence of a secondary network and connections over time.
Urban Energy Data Model, Chicago Loop, 2011
The overall carbon impact attributed to each building relative to its size, shown here in red to represent heavier impact, was calculated using historic and predicted energy use, as well as many externalities such as the flow of goods and people to and from each building.