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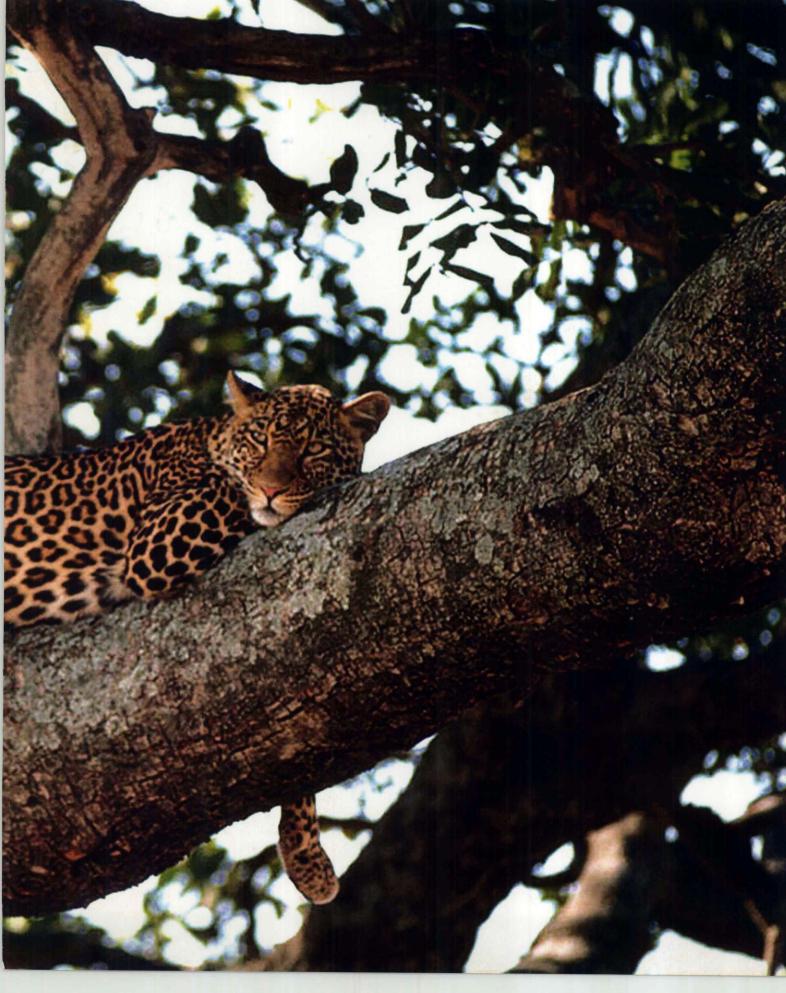
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合成器:

涌现建筑设计组作品中的协同进化与 聚合图谱

"设计师是艺术家、发明家、机械师、客观的经济学家和发展的战略家的渐进的综合体。"

-R. Buckminster Fuller

Tom Wiscombe是一位罕见的建筑师。像富勒所说的理 想的建筑师, Wiscombe通过探索相互竞争学科知识的融 合和对其演进策略的整合,来形成自己独特的建筑实践。 相对于传统建筑工作室的概念,他更倾向于把他的事务 所——涌现组看成是一个"提供给包括生物学、复杂科 学、空间工程、计算等建筑学以外领域的重要技术与思想 的实验平台。" Wiscombe的痴迷和他用来形容渐进组的 建筑研究的语言从龟壳扩展到冲压喷射技术,从模式形态 学的多样到百合花瓣,从结构优化回路到蜻蜓之翼。不可 否认的是,涌现组探索的是一种丰富的和常常是野性的建 筑。Wiscombe声称,他对现代生物学及系统论模型的广泛 兴趣支持了涌现组的成就,使它朝向基于结构形式的生成 和适应性的涌现行为发展。他对于多变的结构、表皮和形 式的令人印象深刻的支配提供了不同于那种电脑屏幕上 闪烁的图象的另一条真正的道路,以权威性的建筑学观点 阐释了新的建筑技术。的确,正是涌现组在协同进化或者 交汇建筑形式的发展方面所取得的非凡成就,体现了其对 于变化的形式,有条件的结构和灵活的系统的更大范围内 的当代和生成的兴趣的回应。

正是处在这样一个介于生成结构的、机械的、表皮的行为 之间的协同演进和交汇的时刻,我们才可能最好地开始理 解渐进组对于一种新型的建筑实践的解释。根据Wiscombe 的理解,建筑中的涌现现象指的是——"通过几何和诗 意的手段"培育"建筑系统之间连贯的关系,向着建筑中 更高秩序的涌现的整体性发展,同时仍保持一种系统的 表现性的细腻"。Wiscombe对当下这个话题的重要贡献, 可以通过反思其三个最近建筑设计竞赛的参赛作品来评 价: Mersey观景台(利物浦,英国2008年), 松兹瓦尔表 演艺术剧院(Sundsvall,瑞典2008年)和欧洲团结中心 (Gdansk,波兰2007年)。这些在短短几个月内完成的项 目,为我们提供了三个重要的启示。首先,这一系列从中型 至大型规模的项目代表了办公室的目前的主张:对于建筑 来说,建筑的整体性超过其各部分的总和。举例来说,倾向 于打造一个独特的单体建筑系统的默西观景台, 既是一个 多功能的公共空间又是一个提供能源的发电装置。这个纤 维复合材料结构由连锁管道和厚片组装而成,并由高强度 胶粘剂粘合在一起,它立刻成为一个进行公共活动的地方 和一个能源收集装置。在这个项目中,公众的使用和用于获 取天然能源的机械功能只是字面上的混合,它们由所在的 结构清晰地分开。其次,作为一个系列,这些项目总结了在

6

The Synthesizer:

Mapping co-evolution and convergence in the work of EMERGENT

A designer is an emerging synthesis of artist, inventor, mechanic, objective economist and evolutionary strategist. -R. Buckminster Fuller

Tom Wiscombe is a rare architect. Like Fuller's ideal designer, Wiscombe seeks to synthesize competing fields of knowledge and integrate evolutionary strategies into his unique architectural practice. He sees his firm EMERGENT less as a traditional architectural studio limited by disciplinary orthodoxies than as a "platform for experimentation, leveraging techniques and logics from fields outside architecture, including biology, complexity science, aerospace engineering, and computation." Wiscombe's obsessions and the language he uses to describe his firm's architectural investigations extend from turtle's shells to SCRAMjet technology; variability in pattern morphology to lily pads; structural optimization loops to dragonfly wings. Undeniably, EMERGENT is seeking a fecund and frequently wild architecture. Wiscombe asserts that EMERGENT's approach is fed by his far ranging interests in contemporary models of biology and systems theory, towards what he sees as an architecture based on coherent structural pattern formation and adaptive emergent behaviors. His studio's impressive command of variable structures, envelopes and forms offers up a genuine path out of the shimmering imagery of the computer screen and into an authoritative demonstration of an architecture grounded in new building techniques. Indeed, it is EMERGENT's novel approach to the development of co-evolutionary or convergent architectural forms that represents the office's most viable response to a larger contemporary and generational interest in varietal forms, conditional structures, and elastic systems.

It is exactly at the moment of co-evolution and convergence, between engendered structural, mechanical, and envelope behaviors, that we may best begin to engage EMERGENT's demonstrations of a novel architectural practice. Emergence in architecture suggests, according to Wiscombe, the nurturing of "coherent relationships between building systems through geometric and atmospheric means... toward a higher-order emergent wholeness in architecture while still maintaining a performative discreetness of systems." Wiscombe's important contributions to the current discourse can be evaluated by reflecting on three recent competition entries: the Mersey Observation Deck (Liverpool, UK, 2008); the Sundsvall Performing Arts Theater (Sundsvall, Sweden, 2008); and the Cheongna City Tower (Incheon, Korea, 2008). These projects, completed within a few months of each other, offer us three important lessons. To begin with, this collection of medium- to large-scale projects represents the office's most current argument for an architecture in which the architectural whole exceeds the sum of its parts. The Mersey Observation Deck, for instance, is both a multifunctional public space and an energy generating device that is intended to be constructed out of a unique monocoque construction system. Assembled from interlocking tubes and slabs and glued together with high-strength adhesives, the fiber composite structure is at once a public surface and

过去几年中涌现组的许多主要兴趣:即对一个基于适应性 而非构成逻辑,并带有投机主义色彩的设计过程的发明。 松兹瓦尔表演艺术剧院动态结构的发展充分体现了这一进 程。这种努力,产生了Wiscombe所指的一个"补缀的网格": 通过增加在一个梯度上的点所在部分的深度来逐步的、有侧 重的加强结构网格的强度。如果一切顺利,生成过程中的 激进形变会根据建筑师所说的"当一个平面网格的结构深 度增加超过了一个经济的程度,结构将分层成为一个带有 空腔的空间三维网架"而发生。最后,这些项目展示了多目 标搜索工具日益复杂地使用一些正在迅速地成为涌现组的 设计方法的标志。对CATIA, Modefrontier和ROBOT等工 具的使用,帮助事务所在欧洲团结中心的项目中获得了自 下而上的解决办法。通过联合参数的,种群生成的和结构 分析的软件,涌现组利用了一个类似的自然选择的过程,来 检验数代对抗各种环境力量的结构和建筑的变化。直到多 目标搜索最终缩小到能够产生由大型空心单元形成的一个 蜂窝结构,才能孕育和检测出成功的解决方法。当这些单 元聚集和捆绑在一起的时候,就会被重组来创造力矩框架 和结构隔板。

在当代建筑的话语范围之内,最近的这些项目为我们提供了最令人信服的证明来鉴定涌现组对于洋溢激情的逻辑和经过优化的美的追求。这些项目共同表达了Wiscombe为他的工作室制定的一个雄心勃勃的目标。清楚地说就是,他想要创造出一个既混乱又有组织,既变化多端又必然有效,既铺张过度又明确详细。虽然也许对于这种没有限制的生命力在自然界中才能被最好的观察,但我想要说那些与渐进组的成就紧密联系在一起的革命性的表现和过程,将我们带向一个崭新的建筑视野下——在那里,福勒曾说的对各个竞争领域的知识(建筑学、工程学、计算和技术试验)的融合,最后将会实现。

Peter Zellner 洛杉矶 2008.6.9

an energy collection device. In this project, programs for civic use and mechanical functions designed to capture natural energy are literally mixed and bound up by the very structure in which they dwell. Secondly, as a suite, the projects summarize many of the EMERGENT's primary interests over the last few years: namely the invention of an opportunistic design process based on adaptive rather than compositional logics. The dynamic structural development of the Sundsvall Performing Arts Theater exemplifies this process. The effort, producing what Wiscombe refers to as a "patchy meshwork," involved incrementally but unevenly, stiffening a structural grid in "patches" by increasing member depth at local points on a gradient. The moment of radical, if smooth transformation in the process occurs, according to the architect, "when structural depth increases past an economical depth for a plate girder system and the structure delaminates into a three dimensional vector frame." Finally, these projects exhibit an increasingly sophisticated use of multi-objective search tools something that is rapidly becoming the hallmark of EMERGENT's design approach. The use of tools such as CATIA, modeFRONTIER, and ROBOT helped the office derive bottom-up solutions for the Cheongna City Tower. By employing a combination of population generation and structural analysis software, EMERGENT utilized a process that is similar to natural selection in order to fitness-test several generations of structural and architectural variation against various environmental forces. Multiobjective search criteria were applied to three supercolumn spines, which were bred and tested until the search was eventually narrowed to produce a diagram from which architecture could be made. These spines are glazed, creating a double-shell construction with vertical wintergardens in the space between.

These recent projects offer us the most compelling testimonial to date of EMERGENT's winning pursuit of excess, passionate logic, and optimized beauty within contemporary architectural discourse. Collectively these projects speak to an ambitious objective that Wiscombe has set for his office: to produce architecture that is at once messy and organized; wildly variable, but nonetheless inevitably operative; excessive but specific. While it may very well be that it is in the natural world where one can best observe such open-ended vitality, I would propose that the innovative performances and processes associated with EMERGENT's approach points us toward a new architectural horizon where the synthesis, as Fuller would have it, of competing fields of knowledge (architecture, engineering, computation, and technological experimentation) will finally be achieved.

Peter Zellner Los Angeles 06:09:08

EMERGENT(涌现)

由Tom Wiscombe成立于1999年的EMERGENT致力于建筑作品的结构、建构和材料研究。EMERGENT是一个欲从建筑学以外的领域获得技术和逻辑的实验平台,这些领域包括生物学、复杂性科学、航空工程和计算。EMERGENT试图通过建筑系统与建筑组件间的系统生成和交互关系来解析建筑。

涌现探索的是依靠现代生物学模型和系统理论并结合人文艺术传达出基于结构性形态和涌现行为的建筑。这项工作是一场更大的,由Detlef Mertins在2004年发起的名为"生物结构主义"的现代建筑运动的一部分,这场运动倾向于利用智能材料作为基点来产生建筑的多变性,并以此应对局部势力的反馈。

这项工作向建筑学中的过剩和效能的辩证关系发起了疑问,并通过生物学的理念对二者有了更加复杂的理解。自然界随机突变和自然选择中的递归关系提供了一种模型,这种模型向我们展示了过剩和效能的动态反馈是怎样产生出建筑的创新和优雅。在事务所里,这种反馈逻辑则由生成和分析的运算法则以及亲手实践的设计技术来实施。

这项工作的关键是现象的"涌现",它提供了一种洞察那些明显脱离于身体、微粒或者系统展示集成行为的一致性和出乎意料的形态的方式。就像蜂群和蜂巢,涌现组织中的动态良质揭示了一种真正的建筑性潜力:组件总是在连接和进行信息交换;更重要的是,建筑整体超越了各部分的总和。

生物学的理念已经领导EMERGENT走向系统整合、建造归纳和构造的新方法研究。最近的与国际工程公司包括Buro Happold和DeSimone Consulting咨询公司的共同冒险已经开始显现新的工作方法,并在工程和设计创想之间建立了活跃的反馈链,最终指向了对AEC领域的重新定义。

About EMERGENT

Founded in 1999 by Tom Wiscombe, EMERGENT is dedicated to researching issues of structure, tectonics, and materiality through built work. EMERGENT is a platform for experimentation, leveraging techniques and logics from fields outside architecture, including biology, complexity science, aerospace engineering, and computation. EMERGENT's directive is to move beyond categorical thinking in architecture and the stratification of building systems. This involves re-examination of hierarchies and discreetness of systems toward coherent but differentiated constructions. Ultimately, the results are understood in terms of both performance and spatial and atmospheric effects.

EMERGENT's approach is informed by contemporary models of biology and systems theory as well as the arts, toward an architecture based on structural pattern formation and emergent behavior. The work is part of a larger contemporary movement in architecture referred to by Detlef Mertins in 2004 as "Bioconstructivism," where a bias toward material intelligence begins to produce an architecture characterized by its variability and responsiveness to local forces.

The work questions the dialectic of excess and efficiency in architecture, in favor of a more complex understanding of both through biological thinking. The recursive process of random mutation and natural selection in nature provides a model for how a dynamic feedback between excesses and efficiencies can create innovation and elegance. This feedback logic is executed in the office using both generative and analytical algorithms as well as hands-on design techniques.

Key to the work is the phenomenon of 'emergence' which offers insight into the way apparently Isolated bodies, particles, or systems exhibit group behavior in coherent but unexpected patterns. The animated beauty of emergent organizations, such as in swarms or hives, points to a range of real architectural potentials where components are always linked and always exchanging information, and above all, where architectural wholes exceed the sum of their parts.

Biological thinking has led EMERGENT toward the exploration of new methods of systems integration, construction documentation, and fabrication. Recent co-ventures with international engineering companies, including Buro Happold and DeSimone Consulting Engineers, have begun to reveal new working methods which establish active feedback loops between engineering and design disciplines, ultimately pointing to a redefinition of AEC territories.

Tom Wiscombe

洛杉矶建筑设计师Tom Wiscombe1970年出生于美国加利福尼亚的Lajolla。1999年,他创立了EMERGENT,一个致力于建筑研究的组织。

EMERGENT目前正在进行一个110米高的办公大楼设计工作,这个大楼是中国贵阳花溪城市中心项目的一部分。为阿联酋所做的淡水广场项目也在进行中。EMERGENT是2007年捷克国家图书馆项目竞赛的最终入围者之一,并在同年的Novosibirsk A&D竞赛和2005年韩国首尔表演艺术中心竞赛中获得第二名。他们曾在UCLA(加利福尼亚大学洛杉矶分校)的建筑画廊中举行过名为"微观多样性"的个展。参与过的其他展览包括2007深圳双年展,2006北京双年展,2006伦敦双年展以及2004年旧金山现代艺术博物馆的"魅力:制造丰富",2003年在纽约现代艺术博物馆和2003和2001在"ArchiLAB"的展览。他们的作品分别被巴黎FRAC中心,旧金山现代艺术博物馆和纽约现代艺术博物馆永久收藏。2004年纽约建筑联盟授予EMERGENT青年建筑师奖。

在2003年,EMERGENT贏得著名的P.S.1/MoMA城市沙滩项目的竞赛,该项目获得了评论界的好评,并荣获2004纽约杰出工程白金奖。Greg Lynn将这个项目评价为"为建筑的诡辩设立了一个新的标准"。

EMERGENT的作品在国际间被广泛出版,例如Esquire, Surface , Vogue, Architectural Record, Architectural Digest, Praxis, Metropolis, A+U, Perspecta, 以及《哈佛设计杂志》和《纽约时报》,《ICON杂志》在2007年的 Manifesto专刊上将EMERGENT列为全球50所最重要的设计事务所之一。

Tom Wiscombe担任蓝天组(Coop Himmelb(I)au)的高级设计师和项目合伙人超过十年,是Wolf Prix的得力助手。他曾负责一系列国际著名的工程,包括德累斯顿的UFA电影城,里昂的Musée des Confluences博物馆,Akron艺术中心。尤其值得一提的是,Tom Wiscombe也是慕尼黑宝马中心建筑的高级设计师,该项目被评为21世纪最重要的建筑之一。

Tom Wiscombe在伯克利大学获得建筑学士学位,在加州大学洛杉矶分校获得建筑学硕士。他曾在南加州建筑学院、加州大学洛杉矶分校、维也纳应用艺术大学教授设计和技术课程。他是2005年度加州大学艾谢瑞克建筑坐席教授,现在南加大建筑学院的X项目中任教,这是一个关注数字设计技术的硕士项目。Wiscombe广泛地举办讲座,最近的讲座分别在康奈尔大学、莱斯大学和耶鲁大学。



Surface-to-strand Morphogies final review, UTS Sydney, 2008

About Tom Wiscombe

Born in 1970 in La Jolla, California, Tom Wiscombe is an architectural designer based in Los Angeles. In 1999, he founded EMERGENT, an organization dedicated to architectural research.

EMERGENT is currently working on the realization of a 110 meter office tower as part of the Huaxi Urban Centre project in Guiyang, China, and a water desalinization prototype for application in the



United Arab Emirates. EMERGENT was a finalist in the Czech National Library Competition in 2007 and won second place in the competitions for the Novosibirsk A&D Pavilion in 2007 and the Seoul Performing Arts Center in 2005. Their work was showcased in a solo show at the UCLA Architecture Gallery entitled Notes on Micromultiplicity in 2005. Other exhibitions include *Matters of Sensation* at Artists Space in 2008, the 2008 Seville Biennale, the 2007 Shenzhen Biennale, the 2006 Bejing Biennale, the 2006 London Biennale, *Glamour: Fabricating Affluence* at MoMA San Francisco in 2004, MoMA New York in 2003, and ArchiLAB in 2003 and 2001. Their work is part of the permanent collections of the FRAC Centre Paris, MoMA San Francisco, and MoMA New York. EMERGENT was also awarded the Architectural League of New York Young Architects Award for 2004.

In 2003, EMERGENT won the competition for the renowned P.S.1/ MoMA Urban Beach project, which opened to critical acclaim, and won the New York Engineering Excellence Platinum Award for 2004. According to Greg Lynn, this project "set a new standard for architectural sophistication at that venue."

The work of EMERGENT has been extensively published, notably in *Esquire, Surface, Vogue, Architectural Record, Architectural Digest, Praxis, Metropolis, A+U, Perspecta, the Harvard Design Magazine,* and *The New York Times. ICON Magazine,* in its *Manifesto Issue* of 2007, named EMERGENT one of the world's 50 most influential design offices.

Tom Wiscombe was Senior Designer and Project Partner at Coop Himmelb(I)au for over 10 years, right-hand to Principal Wolf Prix. He was in charge of various internationally renowned projects, including the Dresden UFA Cinema Palace, the Lyon Musée des Confluences, and the Akron Art Museum. Most notably, Wiscombe was Senior Designer for BMW World, Munich, which has been hailed as one of the most important buildings of the 21st century.

Educated at UCLA (M. Arch. I) and UC Berkeley (B.A. Arch.), Wiscombe has taught design and technology at SCI-Arc, UCLA, UC Berkeley, the Technical University of Sydney, and the University of Applied Arts in Vienna. He was the Esherick Chair of Architecture at UCB for 2005, and is currently teaching in the X-Program at SCI-Arc, a postgraduate program focused on digital design techniques. Wiscombe lectures widely, most recently at Cornell University, Rice University, and Yale University.

